

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
1 February 2001 (01.02.2001)

PCT

(10) International Publication Number
WO 01/08037 A2

- (51) International Patent Classification⁷: **G06F 17/00**
- (21) International Application Number: PCT/US00/20353
- (22) International Filing Date: 26 July 2000 (26.07.2000)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
09/361,338 26 July 1999 (26.07.1999) US
- (71) Applicant (for all designated States except US): **AC PROPERTIES BV** [NL/NL]; Parkstraat 83, NL-2514 JB 's Gravenhage (NL).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **GREENBERG, Nancy, S.** [US/US]; 5529 Newton Avenue South, Minneapolis, MN 55410 (US). **WINN, Colleen, R.** [US/US]; 11472 Fairfield Road #103, Minnetonka, MN 55305 (US).
- (74) Agent: **HICKMAN, Paul, L.**; Hickman Coleman & Hughes, LLP, P.O. Box 52037, Palo Alto, CA 94303 (US).
- (81) Designated States (*national*): AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

— Without international search report and to be republished upon receipt of that report.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.



WO 01/08037 A2

(54) Title: A SYSTEM, METHOD AND ARTICLE OF MANUFACTURE FOR DETERMINING CAPABILITY LEVELS OF PROCESSES FOR PROCESS ASSESSMENT PURPOSES IN AN OPERATIONAL MATURITY INVESTIGATION

(57) Abstract: A system, method, and article of manufacture are provided for determining capability levels of a process area in an operational maturity investigation. A plurality of process attributes are first defined along with a plurality of generic practices for each of the process attributes. Also defined are a plurality of capability levels in terms of groups of the process attributes. Each of the process attributes are then rated based on achievement of the corresponding generic practices. It is then determined which of the capability levels is achieved by a process area. Such determination is based on the rating of the process attributes of the capability levels. Thereafter, the capability level is outputted for gauging a maturity of an operations organization.

**A SYSTEM, METHOD AND ARTICLE OF MANUFACTURE FOR DETERMINING
CAPABILITY LEVELS OF PROCESSES FOR PROCESS ASSESSMENT PURPOSES
IN AN OPERATIONAL MATURITY INVESTIGATION**

5

FIELD OF INVENTION

The present invention relates to IT operations organizations and more particularly to evaluating a maturity of an operations organization by determining capability levels of process areas.

10

BACKGROUND OF INVENTION

Triggered by a recent technology avalanche and a highly competitive global market, the management of information systems is undergoing a revolutionary change. Both information technology and business directions are driving information systems management to a fundamentally new paradigm. While business bottom lines are more tightly coupled with information technology than ever before, studies indicate that many CEOs and CFOs feel that they are not getting their money's worth from their IT investments. The complexity of this environment demands that a company have a formal way of assessing its IT capabilities, as well as a specific and measurable path for improving them.

20

In initiatives to address these issues, various frameworks and gap analysis have been used to capture the best practices of IT management and to determine areas of improvement. While the frameworks and gap analysis are intended to capture weaknesses in processes that are observable, it does not provide data with sufficient objectivity and granularity upon which a comprehensive improvement plan can be built.

25

There is thus a need to add further objectivity and consistency to conventional framework and gap analysis.

SUMMARY OF INVENTION

5 A system, method, and article of manufacture consistent with the principles of the present invention are provided for determining capability levels of a process area as a part of an operational maturity investigation. A plurality of process attributes are first defined along with a plurality of generic practices for each of the process attributes. Also defined are a plurality of capability levels in terms of groups of the process attributes. Each of the process attributes are then rated based on achievement of the corresponding generic practices. It is then determined
10 which of the capability levels is achieved by a process area. Such determination is based on the rating of the process attributes of the capability levels. Thereafter, the capability level is outputted for gauging a maturity of an operations organization.

In one aspect of the present invention, the capability levels may each be achieved upon the
15 ratings of the process attributes of the capability level surpassing a predetermined amount. Further, each capability level may be defined by the process attributes of a lower capability level and further defined by at least one more process attribute.

In yet another aspect of the present invention, the process attributes may include process
20 performance, performance management, work product management, process definition, process resource, process measurement, process control, continuous improvement, and/or process change. Further, the capability levels may include performed informally, planned and tracked, well defined, quantitatively controlled, and/or continuously improving.

25 The present invention provides a basis for organizations to gauge performance, and assists in planning and tracking improvements to the operations environment. The present invention further affords a basis for defining an objective improvement strategy in line with an organization's needs, priorities, and resource availability. The present invention also provides a method for determining the overall operational maturity of an organization based on the
30 capability levels of its processes.

The present invention can thus be used by organizations in a variety of contexts. An organization can use the present invention to assess and improve its processes. An organization can further use the present invention to assess the capability of suppliers in meeting their commitments, and

hence better manage the risk associated with outsourcing and sub-contract management. In addition, the present invention may be used to focus on an entire IT organization, on a single functional area such as service management, or on a single process area such as a service desk.

BRIEF DESCRIPTION OF DRAWINGS

5 The invention may be better understood when consideration is given to the following detailed description thereof. Such description makes reference to the annexed drawings wherein:

Figure 1 is a schematic diagram of a hardware implementation of one embodiment of the present invention;

10 Figure 2 is a flowchart illustrating generally the steps associated with the present invention;

Figure 3 is an illustration showing the relationships of the process category, process area, and base practices of the operations environment dimension in accordance with one embodiment of the present invention;

15

Figure 4 is an illustration showing a measure of each process area to the capability levels according to one embodiment of the present invention;

20

Figure 5 is an illustration showing various determinants of operational maturity in accordance with one embodiment of the present invention;

Figure 6 is an illustration showing an overview of the operational maturity model;

Figure 7 is an illustration showing a relationship of capability levels, process attributes, and generic practices in accordance with one embodiment of the present invention;

25

Figure 8 is an illustration showing a capability rating of various attributes in accordance with one embodiment of the present invention;

30

Figure 9 is an illustration showing a mapping of attribute ratings to the process capability levels determination in accordance with one embodiment of the present invention;

Figure 10 is an illustration showing assessment roles and responsibilities in accordance with one embodiment of the present invention; and

Figure 11 is an illustration showing the process area rating in accordance with one embodiment of the present invention.

DISCLOSURE OF INVENTION

5 The present invention comprises a collection of best practices, both from a technical and management perspective. The collection of best practices is a set of processes that are fundamental to a good operations environment. In other words, the present invention provides a definition of an “ideal” operations environment, and also acts as a road map towards achieving the “ideal” state.

10 Figure 1 is a schematic diagram of one possible hardware implementation by which the present invention may be carried out. As shown, the present invention may be practiced in the context of a personal computer such as an IBM compatible personal computer, Apple Macintosh computer or UNIX based workstation.

15 A representative hardware environment is depicted in Figure 1, which illustrates a typical hardware configuration of a workstation in accordance with one embodiment having a central processing unit 110, such as a microprocessor, and a number of other units interconnected via a system bus 112. The workstation shown in Figure 1 includes a Random Access Memory (RAM) 114, Read Only Memory (ROM) 116, an I/O adapter 118 for connecting peripheral devices such as disk storage units
20 120 to the bus 112, a user interface adapter 122 for connecting a keyboard 124, a mouse 126, a speaker 128, a microphone 132, and/or other user interface devices such as a touch screen (not shown) to the bus 112, communication adapter 134 for connecting the workstation to a communication network 135 (e.g., a data processing network) and a display adapter 136 for connecting the bus 112 to a display device 138.

25 The workstation typically has resident thereon an operating system such as the Microsoft Windows NT or Windows/95 Operating System (OS), the IBM OS/2 operating system, the MAC OS, or UNIX operating system. Those skilled in the art may appreciate that the present invention may also be implemented on other platforms and operating systems.

30 A preferred embodiment of the present invention is written using JAVA, C, and the C++ language and utilizes object oriented programming methodology. Object oriented programming (OOP) has become increasingly used to develop complex applications. As OOP moves toward the mainstream

of software design and development, various software solutions require adaptation to make use of the benefits of OOP.

5 OOP is a process of developing computer software using objects, including the steps of analyzing the problem, designing the system, and constructing the program. An object is a software package that contains both data and a collection of related structures and procedures. Since it contains both data and a collection of structures and procedures, it can be visualized as a self-sufficient component that does not require other additional structures, procedures or data to perform its specific task. OOP, therefore, views a computer program as a collection of largely
10 autonomous components, called objects, each of which is responsible for a specific task. This concept of packaging data, structures, and procedures together in one component or module is called encapsulation.

In general, OOP components are reusable software modules which present an interface that
15 conforms to an object model and which are accessed at run-time through a component integration architecture. A component integration architecture is a set of architecture mechanisms which allow software modules in different process spaces to utilize each others capabilities or functions. This is generally done by assuming a common component object model on which to build the architecture. It is worthwhile to differentiate between an object and
20 a class of objects at this point. An object is a single instance of the class of objects, which is often just called a class. A class of objects can be viewed as a blueprint, from which many objects can be formed.

OOP allows the programmer to create an object that is a part of another object. For example, the
25 object representing a piston engine is said to have a composition-relationship with the object representing a piston. In reality, a piston engine comprises a piston, valves and many other components; the fact that a piston is an element of a piston engine can be logically and semantically represented in OOP by two objects.

30 OOP also allows creation of an object that “depends from” another object. If there are two objects, one representing a piston engine and the other representing a piston engine wherein the piston is made of ceramic, then the relationship between the two objects is not that of composition. A ceramic piston engine does not make up a piston engine. Rather it is merely one kind of piston engine that has one more limitation than the piston engine; its piston is made of

ceramic. In this case, the object representing the ceramic piston engine is called a derived object, and it inherits all of the aspects of the object representing the piston engine and adds further limitation or detail to it. The object representing the ceramic piston engine “depends from” the object representing the piston engine. The relationship between these objects is called inheritance.

When the object or class representing the ceramic piston engine inherits all of the aspects of the objects representing the piston engine, it inherits the thermal characteristics of a standard piston defined in the piston engine class. However, the ceramic piston engine object overrides these ceramic specific thermal characteristics, which are typically different from those associated with a metal piston. It skips over the original and uses new functions related to ceramic pistons. Different kinds of piston engines have different characteristics, but may have the same underlying functions associated with it (e.g., how many pistons in the engine, ignition sequences, lubrication, etc.). To access each of these functions in any piston engine object, a programmer would call the same functions with the same names, but each type of piston engine may have different/overriding implementations of functions behind the same name. This ability to hide different implementations of a function behind the same name is called polymorphism and it greatly simplifies communication among objects.

With the concepts of composition-relationship, encapsulation, inheritance and polymorphism, an object can represent just about anything in the real world. In fact, our logical perception of the reality is the only limit on determining the kinds of things that can become objects in object-oriented software. Some typical categories are as follows:

- Objects can represent physical objects, such as automobiles in a traffic-flow simulation, electrical components in a circuit-design program, countries in an economics model, or aircraft in an air-traffic-control system.
- Objects can represent elements of the computer-user environment such as windows, menus or graphics objects.
- An object can represent an inventory, such as a personnel file or a table of the latitudes and longitudes of cities.
- An object can represent user-defined data types such as time, angles, and complex numbers, or points on the plane.

With this enormous capability of an object to represent just about any logically separable matters, OOP allows the software developer to design and implement a computer program that is a model of some aspects of reality, whether that reality is a physical entity, a process, a system, or a composition of matter. Since the object can represent anything, the software developer can
5 create an object which can be used as a component in a larger software project in the future.

If 90% of a new OOP software program consists of proven, existing components made from preexisting reusable objects, then only the remaining 10% of the new software project has to be written and tested from scratch. Since 90% already came from an inventory of extensively tested
10 reusable objects, the potential domain from which an error could originate is 10% of the program. As a result, OOP enables software developers to build objects out of other, previously built objects.

This process closely resembles complex machinery being built out of assemblies and sub-
15 assemblies. OOP technology, therefore, makes software engineering more like hardware engineering in that software is built from existing components, which are available to the developer as objects. All this adds up to an improved quality of the software as well as an increased speed of its development.

Programming languages are beginning to fully support the OOP principles, such as
20 encapsulation, inheritance, polymorphism, and composition-relationship. With the advent of the C++ language, many commercial software developers have embraced OOP. C++ is an OOP language that offers a fast, machine-executable code. Furthermore, C++ is suitable for both commercial-application and systems-programming projects. For now, C++ appears to be the
25 most popular choice among many OOP programmers, but there is a host of other OOP languages, such as Smalltalk, Common Lisp Object System (CLOS), and Eiffel. Additionally, OOP capabilities are being added to more traditional popular computer programming languages such as Pascal.

30 The benefits of object classes can be summarized, as follows:

- Objects and their corresponding classes break down complex programming problems into many smaller, simpler problems.
- Encapsulation enforces data abstraction through the organization of data into small, independent objects that can communicate with each other. Encapsulation protects the

data in an object from accidental damage, but allows other objects to interact with that data by calling the object's member functions and structures.

- Subclassing and inheritance make it possible to extend and modify objects through deriving new kinds of objects from the standard classes available in the system. Thus, new capabilities are created without having to start from scratch.
- Polymorphism and multiple inheritance make it possible for different programmers to mix and match characteristics of many different classes and create specialized objects that can still work with related objects in predictable ways.
- Class hierarchies and containment hierarchies provide a flexible mechanism for modeling real-world objects and the relationships among them.
- Libraries of reusable classes are useful in many situations, but they also have some limitations. For example:
 - Complexity. In a complex system, the class hierarchies for related classes can become extremely confusing, with many dozens or even hundreds of classes.
 - Flow of control. A program written with the aid of class libraries is still responsible for the flow of control (i.e., it must control the interactions among all the objects created from a particular library). The programmer has to decide which functions to call at what times for which kinds of objects.
 - Duplication of effort. Although class libraries allow programmers to use and reuse many small pieces of code, each programmer puts those pieces together in a different way. Two different programmers can use the same set of class libraries to write two programs that do exactly the same thing but whose internal structure (i.e., design) may be quite different, depending on hundreds of small decisions each programmer makes along the way. Inevitably, similar pieces of code end up doing similar things in slightly different ways and do not work as well together as they should.

Class libraries are very flexible. As programs grow more complex, more programmers are forced to reinvent basic solutions to basic problems over and over again. A relatively new extension of the class library concept is to have a framework of class libraries. This framework is more complex and consists of significant collections of collaborating classes that capture both the small scale patterns and major mechanisms that implement the common requirements and design in a specific application domain. They were first developed to free application programmers from the chores involved in displaying menus, windows, dialog boxes, and other standard user interface elements for personal computers.

Frameworks also represent a change in the way programmers think about the interaction between the code they write and code written by others. In the early days of procedural programming, the programmer called libraries provided by the operating system to perform certain tasks, but
5 basically the program executed down the page from start to finish, and the programmer was solely responsible for the flow of control. This was appropriate for printing out paychecks, calculating a mathematical table, or solving other problems with a program that executed in just one way.

10 The development of graphical user interfaces began to turn this procedural programming arrangement inside out. These interfaces allow the user, rather than program logic, to drive the program and decide when certain actions should be performed. Today, most personal computer software accomplishes this by means of an event loop which monitors the mouse, keyboard, and other sources of external events and calls the appropriate parts of the programmer's code
15 according to actions that the user performs. The programmer no longer determines the order in which events occur. Instead, a program is divided into separate pieces that are called at unpredictable times and in an unpredictable order. By relinquishing control in this way to users, the developer creates a program that is much easier to use. Nevertheless, individual pieces of the program written by the developer still call libraries provided by the operating system to
20 accomplish certain tasks, and the programmer must still determine the flow of control within each piece after it's called by the event loop. Application code still "sits on top of" the system.

Even event loop programs require programmers to write a lot of code that should not need to be written separately for every application. The concept of an application framework carries the
25 event loop concept further. Instead of dealing with all the nuts and bolts of constructing basic menus, windows, and dialog boxes and then making these things all work together, programmers using application frameworks start with working application code and basic user interface elements in place. Subsequently, they build from there by replacing some of the generic capabilities of the framework with the specific capabilities of the intended application.

30 Application frameworks reduce the total amount of code that a programmer has to write from scratch. However, because the framework is really a generic application that displays windows, supports copy and paste, and so on, the programmer can also relinquish control to a greater degree than event loop programs permit. The framework code takes care of almost all event

handling and flow of control, and the programmer's code is called only when the framework needs it (e.g., to create or manipulate a proprietary data structure).

5 A programmer writing a framework program not only relinquishes control to the user (as is also true for event loop programs), but also relinquishes the detailed flow of control within the program to the framework. This approach allows the creation of more complex systems that work together in interesting ways, as opposed to isolated programs, having custom code, being created over and over again for similar problems.

10 Thus, as is explained above, a framework basically is a collection of cooperating classes that make up a reusable design solution for a given problem domain. It typically includes objects that provide default behavior (e.g., for menus and windows), and programmers use it by inheriting some of that default behavior and overriding other behavior so that the framework calls application code at the appropriate times.

15 There are three main differences between frameworks and class libraries:

- Behavior versus protocol. Class libraries are essentially collections of behaviors that one can call when one wants those individual behaviors in a program. A framework, on the other hand, provides not only behavior but also the protocol or set of rules that govern the ways in which behaviors can be combined, including rules for what a programmer is supposed to provide versus what the framework provides.
- Call versus override. With a class library, the code the programmer instantiates objects and calls their member functions. It's possible to instantiate and call objects in the same way with a framework (i.e., to treat the framework as a class library), but to take full advantage of a framework's reusable design, a programmer typically writes code that overrides and is called by the framework. The framework manages the flow of control among its objects. Writing a program involves dividing responsibilities among the various pieces of software that are called by the framework rather than specifying how the different pieces should work together.
- Implementation versus design. With class libraries, programmers reuse only implementations, whereas with frameworks, they reuse design. A framework embodies the way a family of related programs or pieces of software work. It represents a generic design solution that can be adapted to a variety of specific problems in a given domain. For example, a single framework can embody the way a user interface works, even

though two different user interfaces created with the same framework might solve quite different interface problems.

Thus, through the development of frameworks for solutions to various problems and programming tasks, significant reductions in the design and development effort for software can be achieved. A preferred embodiment of the invention utilizes HyperText Markup Language (HTML) to implement documents on the Internet together with a general-purpose secure communication protocol for a transport medium between the client and the Newco. HTTP or other protocols could be readily substituted for HTML without undue experimentation.

Information on these products is available in T. Berners-Lee, D. Connolly, "RFC 1866: Hypertext Markup Language - 2.0" (Nov. 1995); and R. Fielding, H. Frystyk, T. Berners-Lee, J. Gettys and J.C. Mogul, "Hypertext Transfer Protocol -- HTTP/1.1: HTTP Working Group Internet Draft" (May 2, 1996). HTML is a simple data format used to create hypertext documents that are portable from one platform to another. HTML documents are SGML documents with generic semantics that are appropriate for representing information from a wide range of domains. HTML has been in use by the World-Wide Web global information initiative since 1990. HTML is an application of ISO Standard 8879; 1986 Information Processing Text and Office Systems; Standard Generalized Markup Language (SGML).

To date, Web development tools have been limited in their ability to create dynamic Web applications which span from client to server and interoperate with existing computing resources. Until recently, HTML has been the dominant technology used in development of Web-based solutions. However, HTML has proven to be inadequate in the following areas:

- Poor performance;
- Restricted user interface capabilities;
- Can only produce static Web pages;
- Lack of interoperability with existing applications and data; and
- Inability to scale.

Sun Microsystem's Java language solves many of the client-side problems by:

- Improving performance on the client side;
- Enabling the creation of dynamic, real-time Web applications; and
- Providing the ability to create a wide variety of user interface components.

With Java, developers can create robust User Interface (UI) components. Custom "widgets" (e.g., real-time stock tickers, animated icons, etc.) can be created, and client-side performance is improved. Unlike HTML, Java supports the notion of client-side validation, offloading appropriate processing onto the client for improved performance. Dynamic, real-time Web pages can be created. Using the above-mentioned custom UI components, dynamic Web pages can also be created.

Sun's Java language has emerged as an industry-recognized language for "programming the Internet." Sun defines Java as: "a simple, object-oriented, distributed, interpreted, robust, secure, architecture-neutral, portable, high-performance, multithreaded, dynamic, buzzword-compliant, general-purpose programming language. Java supports programming for the Internet in the form of platform-independent Java applets." Java applets are small, specialized applications that comply with Sun's Java Application Programming Interface (API) allowing developers to add "interactive content" to Web documents (e.g., simple animations, page adornments, basic games, etc.). Applets execute within a Java-compatible browser (e.g., Netscape Navigator) by copying code from the server to client. From a language standpoint, Java's core feature set is based on C++. Sun's Java literature states that Java is basically, "C++ with extensions from Objective C for more dynamic method resolution."

Another technology that provides similar function to JAVA is provided by Microsoft and ActiveX Technologies, to give developers and Web designers wherewithal to build dynamic content for the Internet and personal computers. ActiveX includes tools for developing animation, 3-D virtual reality, video and other multimedia content. The tools use Internet standards, work on multiple platforms, and are being supported by over 100 companies. The group's building blocks are called ActiveX Controls, small, fast components that enable developers to embed parts of software in hypertext markup language (HTML) pages. ActiveX Controls work with a variety of programming languages including Microsoft Visual C++, Borland Delphi, Microsoft Visual Basic programming system and, in the future, Microsoft's development tool for Java, code named "Jakarta." ActiveX Technologies also includes ActiveX Server Framework, allowing developers to create server applications. One of ordinary skill in the art readily recognizes that ActiveX could be substituted for JAVA without undue experimentation to practice the invention.

One embodiment of the present invention includes three different, but complementary dimensions that together provide a framework which can be used in assessing and rating the IT operations of an organization. The following three dimensions constitute the framework of the present invention: 1) Operations Environment Dimension, 2) Capability Dimension, and 3) Maturity Dimension.

5

The first dimension describes and organizes the standard operational activities that any IT organization should perform. The second dimension provides a context for evaluating the performance quality of these operational activities. This dimension specifies the qualitative characteristics of an operations environment and orders these characteristics on a scale denoting rising capability. The final dimension uses this capability scale and outlines a method for deriving a capability rating for specific IT process groups and the entire organization.

10

The Operations Environment and Capability dimensions provide the foundation for determining the quality or capability level of the organization's IT operations. The Operations Environment dimension can be viewed as a descriptive mapping of a model operations environment. In a similar manner, the Capability dimension can be construed as a qualitative mapping of a model operations environment. The Maturity dimension builds on the foundation set by these two dimensions to provide a method for rating the maturity level of the entire IT organization.

15

Figure 2 is a flow chart illustrating the various steps associated with the different dimensions of the present invention. As shown, a plurality of process areas of an operations organization are first defined in terms of either a goal or a purpose in operation 200. The process areas are then grouped into categories, as indicated in operation 202. It should be noted that the categories are grouped in terms of process areas having common characteristics.

20

Next, in operation 204, process capabilities are received for the process areas of the operations organization. Such data may be generated via a maturity questionnaire which includes a set of questions about the operations environment that sample the base practices in each process area of the present invention. The questionnaire may be used to obtain information on the capability of the IT organization, or a specific IT area or project.

25

Thereafter, category capabilities are calculated for the categories of the process areas in operation 206. A maturity of the operations organization is subsequently determined based on the category capabilities of the categories in operation 208.

The user-specified or measured parameters, i.e., capability of each of the process areas, may be inputted by any input device, such as the keyboard **124**, the mouse **126**, the microphone **132**, a touch screen (not shown), or anything else such as an input port that is capable of relaying such information. Further, the definitions, grouping, calculations and determinations may be carried out manually or via the CPU **110**, which in turn may be governed by a computer program stored on a computer readable medium, i.e., the RAM **114**, ROM **116**, the disk storage units **120**, and/or anything else capable of storing the computer program. In the alternative, dedicated hardware such as an application specific integrated circuit (ASIC) may be employed to accomplish the same. As an option, any one or more of the definitions, grouping and determinations may be carried out manually or in combination with the computer.

Further, the outputting of the determination of the maturity of the operations organization may be effected by way of the display **138**, the speaker **128**, a printer (not shown) or any other output mechanism capable of delivering the output to the user. It should be understood that the foregoing components need not be resident on a single computer, but also may be a component of either a networked client and/or a server.

Operations Environment Dimension

The Operations Environment Dimension is characterized by a set of process areas that are fundamental to the effective technical execution of an operations environment. More particularly, each process is characterized by its goals and purpose, which are the essential measurable objectives of a process. Each process area has a measurable purpose statement, which describes what has to be achieved in order to attain the defined purpose of the process area.

In the present description, goals refer to a summary of the base practices of a process area that can be used to determine whether an organization or project has effectively implemented the process area. The goals signify the scope, boundaries, and intent of each process area.

The process goals and purpose may be achieved in an IT organization through the various lower level activities; such as tasks and practices that are carried out to produce work products. These performed tasks, activities and practices, and the characteristics of the work products produced

are the indicators that demonstrate whether the specific process goals or purpose is being achieved.

In the present description, work product describes evidence of base practice implementation. For example, a completed change control request, a resolved trouble ticket, and/or a service level agreement (SLA) report.

The operations environment is partitioned into three process areas: Process Categories, Process Areas and Base Practices which reflect processes within any IT organization. Figure 3 depicts and summarizes the relationship of the Process Categories 300, Process Areas 302, and Base Practices 304 of the Operations Environment Dimension. This breakdown provides a grouping by type of activity. The activities characterize the performance of a process. The three level hierarchy is described as follows.

Process Categories (300)

In the present description, a Process Category has a defined purpose and measurable goals and consists of logically related set of Process Areas that collectively address the purpose and goals, in the same general area of activity.

The purpose of Process Categories is to organize Process Areas according to common IT functional characteristics. There are four process categories defined in the present invention: Service Management, Systems Management, Managing Change, and IT Operations Planning. Process Categories are described as follows:

Category Number	1
Category Name	<i>Service Management</i>
Category Description	Service Management is the direct interface to the users of the distributed system. Service Management is responsible for managing user expectations, and is the direct interface to the developers/architects and vendors for the distributed system. Each of these groups has requirements for and introduces changes into the distributed environment. Service Management controls the overall service to the users and handles the relationship with the developers/architects and vendors.
Process Areas	Service Level Agreement Management Operational Level Agreement Management Service Desk Service Pricing User Administration
Category Goals	To effectively manage customer expectations To provide consistent and agreed upon service and performance

	<p>To effectively tie business requirements to IT services provided</p> <p>To provide timely and responsive resolution to customer problems and requests</p> <p>To improved customer satisfaction</p> <p>To maintain accounting information on service and resource usage</p>
Relationships to other Categories	Undefined

Category Number	2
Category Name	<i>Systems Management</i>
Category Description	Systems Management involves all functions required to support the day to day operations of the systems, including network and database. Regardless of changes going on within the distributed environment, Systems Management activities must take place in an ongoing manner.
Process Areas	<p>Production Scheduling</p> <p>Print Management</p> <p>File Transfer and Control</p> <p>Network Services</p> <p>Backup/Restore/Archive</p> <p>Monitoring – Event/Fault</p> <p>Performance Management</p> <p>Security Management & Planning</p> <p>Physical Site Management & Planning</p> <p>Mass Storage Management</p>
Category Goals	<p>To optimize the day to day efficiency of the operations system</p> <p>To ensure system integrity and security</p> <p>To receive timely recognition of system component failure and minimize the recovery time.</p>
Relationships to other Categories	Undefined

Category Number	3
Category Name	<i>Managing Change</i>
Category Description	Managing Change includes all the functions that enable controlled and repeatable management of Software/Hardware components as they evolve through the development life cycle into production.
Process Areas	<p>Release Management</p> <p>Change Control</p> <p>Validation</p> <p>Deployment</p> <p>Software / Data Distribution</p> <p>Migration Control</p> <p>Repository Management</p> <p>Content Management</p> <p>License Management</p> <p>Asset Management</p> <p>Procurement</p>
Category Goals	<p>To minimize the impact of change on day-to-day operations</p> <p>To effectively deploy new technology to the user community</p>

	To effectively migrate new releases into the operational environment To maintain an accurate inventory of all hardware and software assets To ensure that content meets business requirements
Relationships to other Categories	Undefined

Category Number	4
Category Name	<i>IT Operations Planning</i>
Category Description	IT Operations Planning encompasses all of the functions which outline the tactical and strategic planning that needs to take place in order to manage a distributed environment effectively.
Process Areas	Continuous Improvement Strategic Planning Quality Management Legal Issues Management Capacity Modeling and Planning Business / Disaster Recovery Planning and Management
Category Goals	To provide an assessment of the organization’s ability to support and maintain the distributed environment. To provide a strategic plan for the operations environment based on business needs. To identify areas of legal risk
Relationships to other Categories	Undefined

5 Process Areas (302)

Process Areas are the second level in the operations hierarchy. The elements of this level are a collection of Base Practices that are performed to achieve the defined purpose of the Process Area.

10 In the present description, Process Areas refer to a collection of Base Practices that are performed sequentially, concurrently and/or iteratively to achieve the defined purpose of the process area. The purpose describes the unique functional objectives of the process area when instantiated in a particular environment. Satisfying the purpose statement of a process area represents the first step in building process area capability.

15

Examples of Process Areas for the Service Management Category include service level management, operations level management, service desk, user administration, and service pricing. To illustrate further, the purpose of service level management may be to document the

information technology services to be delivered to users. Note that this purpose states a unique functional objective (to establish requirements), and provides a context (service level).

Base Practices (304)

5 Base Practices are the lowest level in the operation hierarchy. Base Practices are essential activities that an IT organization performs to achieve the purpose of a Process Area. A base practice is what an IT organization does.

10 For example, Base Practices of service level management may be to assess business strategy, audit current service levels, determine service requirements and IT’s ability to deliver services, prepare a draft SLA, identify the charge-back structure, and agree to SLAs with customers. The Process Areas are expressed in terms of their goals, whereas Base Practices are tasks that need to be carried out to achieve those goals. Base Practices may have work products associated with them. A work product is evidence of base practice implementation, for example, a completed
15 change control request, a resolved trouble ticket, and/or a SLA report.

A service desk example of a process area and associated base practices is as follows:

PA Number	1.3
PA Name	Service Desk
PA Purpose	<p>The Service Desk provides a single point of contact for users with problems or specific service request. The Service Desk forms part of an organization’s strategy to enable users and business communities to achieve business objectives through the use of technology.</p> <p>The Service Desk main objectives are: To help users when required. To manage problem resolution. To log and document problems types, their frequency, and associated workarounds. To produce management reports on levels of service and user satisfaction.</p> <p>The Service Desk consists of the following functions:</p> <p><i>Incident Management</i> – An incident is a single occurrence of an issue that affects the delivery of normal or expected services. Incident Management strives to resolve as high a proportion of incidents as possible prior to passing them on to other areas.</p> <p><i>Problem Management</i> – A problem is the underlying cause of one or more incidents. Problem Management utilizes the skills of experts and support groups to fix and prevent recurring incidents by determining and fixing the underlying problems causing the incidents.</p> <p><i>Request Management</i> – Request Management is responsible for coordinating and controlling all activities necessary to fulfill a request from a user, vendor, or developer. Requests can be raised as change requests with Change Control, or planned, executed, and tracked by the Service Desk. Request Management is responsible for coordinating and controlling all activities necessary to fulfill a request from a user, vendor, or developer. Further sub-</p>

	<p>functions of Request Management are: <i>Request Logging</i> <i>Impact Analysis</i> <i>Authorization</i> <i>Prioritization</i></p>
PA's Base Practices	<p>1.3.1 Call attention 1.3.2 Incident/request logging 1.3.3 Incident/request qualification 1.3.4 Incident/request assignment 1.3.5 Incident & problem resolution 1.3.6 SLA & OLA tracking and monitoring 1.3.7 Resolution confirmation 1.3.8 Incident/request closure 1.3.9 Trends and repetitive incidents analysis 1.3.10 Service level control 1.3.11 Receive requests</p>
PA Goals	<p>To continuously improve IT service delivery to users. To progress from reactive to proactive user support. To provide a solution to meet technical and business problems. To out perform and exceed user expectations.</p>
PA's Metrics	<p>Average Response Time for Incidents/Problems Support Desk Cost Per User Average Resolution Time Percentage of Calls Escalated Percentage of Calls Answered</p>

Base Practices

BP Number	1.3.1
BP Name	Call attention
BP Description	To ensure full coverage of all possible user timetables, various methods of communication with the Service Desk should be made available.
Example	<i>The Service Desk can receive incidents, problems, and requests via phone, fax, e-mail, internet, and automation through application tools.</i>
BP Number	1.3.2
BP Name	Incident/request logging
BP Description	Service Desk operators manually log incidents due to calls received. Incidents may also be generated automatically by various systems management tools. Incident Logging consists of a categorization of the call and its prioritization using a prioritization scheme. The Service Desk performs this process on-line with the user.
Example	<i>Service Desk analysts log incidents and requests into a problem management system, such as Remedy ARS, Expert Advisor, or a Lotus Notes database. Information such as name, phone, location, asset details, nature of problem, severity, etc., should be included in the trouble ticket or request.</i>
BP Number	1.3.3
BP Name	Incident/request qualification
BP Description	As soon as an incident is received from a user, an attempt is made to resolve it immediately. A case-based reasoning tool that searches a knowledge database can assist with possible solutions.
Example	<i>A resolution to an incident or problem by the Service Desk analyst can be made using various methods. These can vary by previous experience, a known solution for a short-term problem (for example, a printer isn't working, so the user is redirected to a working printer), reviewing vendor documentation, or by using knowledge base programs integrated with the problem management tool.</i>
BP Number	1.3.4
BP Name	Incident/request assignment
BP Description	This step is performed when first level of the Service Desk cannot solve the incident, problem, or request.
Example	<i>After providing the user with the incident ID, a resource is assigned to take ownership of the trouble ticket. The first assignment should be a first level support staff when possible. A</i>

	<i>second level assignment should be performed only for complex incidents requiring a specific expertise. This support person may or may not be part of the Service Desk. The new assignee is then notified of the status of the incident/request.</i>
BP Number	1.3.5
BP Name	Incident & problem resolution
BP Description	If a solution is not found within the time specified in the SLA the problem is escalated. Escalation (manual or automated) is subject to the Tracking and Monitoring process step.
Example	<i>Reassignments can occur during a problem resolution when it has not been fixed within the SLA target hours or when a more appropriate resource could resolve the problem. The appropriate IT resource must be notified if no solution can be found after the incident has been escalated to the highest priority.</i>
BP Number	1.3.6
BP Name	SLA & OLA tracking and monitoring
BP Description	The Service Desk is responsible for tracking the problem resolution process to ensure they are meeting the required level of service.
Example	<i>Service Desk operators or experts should monitor and detect: Incidents not associated with a problem Excessive reassignments Deviations in the times estimated to carry out tasks Problem types and frequency</i>
BP Number	1.3.7
BP Name	Resolution confirmation
BP Description	Before a problem can be marked as 'closed', affected users must be consulted. If resolution is not confirmed and the call has been escalated to the highest priority, the appropriate IT resource is notified and may deal with the user directly.
Example	<i>When the Service Desk resolves a problem, the user must be contacted to ensure that the incident or request was resolved to their satisfaction. Once the user has agreed that the matter is resolved, the Service Desk analyst will mark the incident closed.</i>
PB Number	1.3.8
PB Name	Incident/request closure
PB Description	When the incident is closed, the solution must be reported in the solution database if it is associated to a problem.
Example	<i>In order to resolve future problems, solutions to problems need to be entered into the problem management system. In the future, Service Desk analysts can then query the database for solutions to incidents that are received.</i>
BP Number	1.3.9
BP Name	Trends and repetitive incidents analysis
BP Description	Repetitive incidents and chronic resources are identified so that a proactive response can be provided and service levels can be improved.
Example	<i>One on-going task of second level support staff should be to collect historical data about recurring incidents that could be associated with underlying problems. Using monitoring tools and incidents logged by users, analysis should be conducted to proactively identify issues that cause problems and recurring incidents.</i>
BP Number	1.3.10
BP Name	Service level control
BP Description	Monitoring and control processes are used to ensure that the quality of problem management service offered to users is satisfactory and in accordance with agreed SLAs.
Example	<i>The Service Desk will generate internal reports on its ability to meet service levels. Examples of reports include: number of incidents resolved at the initial call; number of calls escalated to Tier 2; and resolution time by severity.</i>
BP Number	1.3.11
BP Name	Receive requests
BP Description	If a user request results in the necessity for a change to be made, the request will affect the Change Control function, which may be outside of the Service Desk. Some requests, however, do not require a real change as they are related to equipment upgrades, new equipment requests, new user profiles, information on the system, 'how-to' questions, and so on.

Example	<i>The Service Desk will receive requests of all types, including requests for new users, moves, and updates to software or hardware. All requests are logged and tracked in the same manner as incidents and problems.</i>
---------	---

Capability Dimension

In the present description, Capability Dimension refers to formalizing the process performance into quantifiable range of expected results based on the process capability level that can be achieved by following the process. Process capability dimension characterizes the level of capability of each process area within an organization. In other words, the process capability dimension describes how well the processes in the process dimension are performed.

The Capability Dimension measures how well an IT organization performs its operational processes. In determining capabilities, the Base Practices are viewed as a guide to what should be done. The related Generic Practices deal with the effectiveness in which the Base Practices are carried out. Capability Levels, Process Attributes, and Generic Practices describe the Process Capability. The present invention has five levels of Process Capability that can be applied to any Process Area. The Capability Dimension provides a means to formalize and quantify the process performance. The Capability Dimension describes how well the processes are performed as contrasted with Base Practices that describe what an IT organization does.

The Capability Dimension consists of three components: Capability Levels, Process Attributes, and Generic Practices. These are described below.

Capability Levels

In the present description, Capability Levels indicate increasing levels of process maturity and are comprised of one or more generic practices that work together to provide a major enhancement in the capability to perform the process.

The Capability Level is the highest level of the Capability dimension. The Capability Level of a process determines its performance and effectiveness. Each Capability Level has certain Process Attributes associated with it. A Process Attribute is comprised of a set of Generic Practices that provide criteria for improving performance. A particular Capability Level is achieved when all the Process Attributes associated with it and with preceding levels are present. Therefore, once the Capability Level is determined, those Process Attributes - and associated Generic Practices -

that are required to enhance capability can be identified. In other words, Capability Levels offer a staged guideline for improving the capability to perform the defined processes.

5 Capability Levels provide two benefits: they acknowledge dependencies and relationships among the Base Practices of a Process Area, and they help an IT organization identify which improvements should be performed first, based on a plausible sequence of process implementation.

10 Each level provides a major enhancement in capability to that provided by its predecessors in the fulfillment of the process purpose. For example, at capability Level 1, Base Practices are performed. The performance is ad hoc, informal, and unpredictable. At capability Level 2, the performing of Base Practices are planned and tracked versus just performed – thereby offering a significant improvement over Level 1 practice.

15 In this architecture, the Capability Levels are applied to each Process Area independent of other Process Areas. An assessment is performed to determine Process Capability for each Process Area, as illustrated in Figure 4.

20 In the present description, an assessment refers to a diagnostic performed by a trained team to evaluate aspects of an organization's IT operations environment processes. The trained team determines the state of the operational processes, identifies pressing operational process related issues, and obtains organizational support for a process improvement program.

25 Therefore, different Process Areas can, and may, exist at different levels of capability. The ability to rate Process Areas independently enables an IT organization to focus on process improvement priorities driven from business goals and strategic directions. An example of this is illustrated in Figure 4.

Process Attributes

30 In the present description, process attributes refer to features of a process that can be evaluated on a scale of achievement (performed, partially performed, not performed, etc.) which provide a measure of the capability of the process.

Within the framework of the present invention, measures of capability are based on a set of nine Process Attributes. Process Attributes are used to determine whether a process has reached a given capability. The nine Process Attributes are:

- 5 • Process Performance
- Performance Management
- Work Product Management
- Process Definition
- Process Resource
- 10 • Process Measurement
- Process Control
- Process Change
- Continuous Improvement

15 The attributes are evaluated on a four-point scale of achievement. Achieving a given Capability Level depends on the rating assigned to one or more of these attributes.

Generic Practices

20 In the present description, Generic Practices refer to activities that contribute to the capability of managing and improving the effectiveness of the operations environment Process Areas. A generic practice is applicable to any and all Process Areas. It contributes to overall process management, measurement, and the institutionalization capability of the Process Areas.

25 For example, the allocation of adequate resources to a process is a Generic Practice and is applicable to all processes. Service Level Management and Migration Control are two different Process Areas with different Base Practices, goals, and purposes. However, they share the same Generic Practice of allocation of adequate resources.

Maturity Dimension

30 Operational Maturity Dimension characterizes the maturity of an entire operations IT organization. In the present description, maturity refers to the degree of order (structure or systemization) and effectiveness of a process. The degree of order determines its state of maturity. Less mature processes are less ordered and less effective; more mature processes are more ordered and more effective.

The Capability Dimension focuses on the determination of the capability of individual processes, within an operations organization, in achieving their stated goals and purpose. The Operational Maturity Dimension determines the IT organizational maturity by focusing on a collection of processes at a certain level of capability in order to characterize the evolution of the operations IT organization as they improve.

The term Maturity, in the overall context of present invention, is applied to an IT organization as a whole. The Maturity Level is determined by the Capability Level of the four Process Categories: Service Management, Systems Management, Managing Change, and IT Operations Planning. Operational maturity is defined by a staged model, wherein a operational maturity level **500** cannot be reached until all Process Categories driving it have themselves reached a certain maturity level. Similarly, a category Capability Level **502** cannot be reached until all Process Areas **302** contained in it have reached a certain Process Capability Level **504**. This staging is illustrated in Figure 5.

In the present description, Maturity Level refers to a sequence of key intermediate states leading to the goal state. Each state builds incrementally on the preceding state.

Even though it is recommended that an entire operational assessment be conducted, the assessment tool of the present invention is flexible to accommodate an assessment of a Process Category or just a Process Area. As shown in Figure 5, an assessment could end at the Process Area Level with the Process Capability Level or Process Area Maturity determined. An assessment could also be performed to assess all the Process Areas within a Process Category to determine the Process Category Maturity Level.

The framework of the present invention, which consists of the three dimensions described previously, is illustrated in Figure 6. The Operations Environment Dimension **600**, the box in the center of Figure 6, divides all IT processes into Process Categories **300**. Process Categories **300** divide into a finite number of Process Areas **302**. Process Areas **302** consist of a finite number of Base Practices **304**.

Each Process Area within a category is assigned a Capability Level **504** based on the performance of Process Attributes **601** comprised of a finite number of Generic Practices **602** applicable to that process (shown in the box on the right).

5 In turn, the IT organization's operational maturity **603** present invention is based on a clustering of process capabilities, as illustrated in the third box to the left.

The framework of the present invention is designed to support an IT organization's need to assess and improve their operational capability. The structure of the model enables a consistent appraisal methodology to be used across diverse Process Areas. The distinction between
10 essential operations and process management-focused elements therefore allows a systematic approach to process improvement.

Capability Determination

15 As described in the previous section, the Capability Dimension of the present invention measures how capable an IT organization is in achieving the purpose of its various Process Areas. Within the context of the present invention, Capability Levels, Process Attributes, and Generic Practices describe the Process Capability. In this section, the Capability Levels, their characteristics, the Process Attributes, and the Generic Practices that comprise them are discussed in more detail.

20 The present invention has five levels of Process Capability that can be applied to any Process Area. As mentioned before, Generic Practices are grouped by Process Attributes, and Process Attributes determine the Capability Level. Capability Levels build upon one another; levels cannot, therefore, be skipped.

25 Figure 7 tabulates the relationship of Generic Practices and Process Attributes to Capability Levels.

The following section explains in greater detail what is meant by Level 1, Level 2, and so forth.
30 Each Level is described in terms of its characteristics and the Generic Practices (GP) assigned to it.

Level 1: Performed Informally

At this Level, all Base Practices are generally performed, but operations may be ad hoc and occasionally chaotic. Consistent planning and tracking of performance is not performed. Good performance depends on individual knowledge and effort. Operational support and services are generally adequate, but quality and efficiency depend on how well individuals within the IT organization perceive that tasks should be performed. The capability to perform an activity is not generally repeatable or transferable.

Process Attribute

ATT 1A: Process Performance - the extent to which the execution of the process employs a set of practices which uses identifiable input work products to produce identifiable output work products that are adequate to satisfy the purpose of the process.

In order to achieve this capability, Base Practices of the process must be implemented and work products must be produced that satisfy the process purpose. The related Generic Practice is:

GP1.1 Ensure that Base Practices are performed.

When all base practices are performed, the purpose of the process area is satisfied. A process may exist but it may be informal and undocumented.

Level 2: Planned and Tracked

At this Level, performance of the Base Practices in the Process Area is planned and tracked. The necessary discipline is in place to repeat earlier successes with similar characteristics.

There is general recognition that the Process Area performance is dependent on how efficiently the Base Practices are implemented. Work products, such as completed change control requests, resolved trouble tickets, etc., which are related to base practice implementation are periodically reviewed and placed under version control. Corrective action is taken when variances in services and work products occur.

Process Attribute

ATT 2A: Performance Management - the extent to which the execution of the process is managed in order to produce work products within a stated time and resource requirement. The related Generic Practices are:

GP2.1 Establish and maintain a policy for performing operational tasks.

Policy is a visible way for the operations environment personnel and the management team to set expectations. The form of policies varies widely depending on the local culture. Policy typically specifies that plans are documented, managed and controlled, and that reviews are conducted.

5 Policy provides guidance for performing the operational tasks and processes.

GP2.2 Allocate sufficient resources to meet expectations.

Resources include adequate funding, appropriate physical facilities, skilled people, and appropriate tools. This practice ensures that the level of effort, appropriate skills mix, tools, workspace, and other direct resources are available to perform the operational task and processes.

10

GP2.3 Ensure personnel receive the appropriate type and amount of training.

Ensure that the individuals are appropriately trained on how to perform the operational tasks and processes. Training provides a common basis for repeatable performance. Even if the operations personnel or management have satisfactory technical skills and knowledge, there is almost always a need to establish a common understanding of the operational process activities and how skills are applied in them. Training, and how it is delivered, may change with process capability due to changes in how the process is performed and managed.

15

20

GP2.4 Collect data to measure performance.

The use of measurement implies that the metrics have been defined and selected, and data has been collected. Building a history of measures, such as cost and schedule variances, is a foundation for managing by data. Quality measures may be collected and used, but result in maximum impact at Level 4 when they are subjected to quantitative process control.

25

GP2.5 Maintain communication among team members.

Open communication ensures that there is common understanding, that decisions are consensual, and that team members are kept aware of decisions made. Communication is needed when changes are made to plans, products, processes, activities, requirements, and responsibilities. The commitments, expectations, and responsibilities are documented and agreed upon within the project group. Commitment may be obtained by negotiation, by using input and feedback, or through joint development of solutions to issues. Issues are tracked and resolved within the

30

group. Communication occurs periodically and whenever the status changes. The participants have access to data, status information, and recommended actions.

Process Attribute

5 ATT 2B: Work Product Management - the extent to which the process is managed to produce work products that are documented and controlled, and that meet their functional and non-functional requirements, in line with the work product quality goals of the process.

10 In order to achieve this capability, a process needs to have stated functional and non-functional requirements for work products, including integrity, and to produce work products that fulfill the stated requirements. The related Generic Practices are:

GP2.6 Ensure work products satisfy documented requirements.

15 Requirements may come from the business customer, policies, standards, laws, regulations, etc. The applicable requirements are documented and available for verification activities.

GP2.7 Employ version control to manage changes to work products.

20 Place identified work products under version control, or configuration management to provide a means of controlling work products and services.

Level 3: Well-Defined

At Level 3, Base Practices are performed with the assistance of an available, well-defined, and operations-wide process infrastructure. The processes are tailored to meet the specific needs of a certain practice.

25 Data from using the process are gathered to determine if modifications or improvements should be made. This information is used in planning and managing the day-to-day execution of multiple projects within the IT organization, and for short and long-term process improvement.

30 Once the environment is stable, common practices for performing the processes are collected, defined in a consistent manner, and used as the basis for long-term improvement across the operations environment. At this level, the proper mechanism is in place to distribute knowledge and experience throughout the operations environment.

Process Attribute

ATT 3A: Process Resource - the extent to which the execution of the process uses suitable skilled human resources and process infrastructure effectively to contribute to the defined business goals of the operations environment.

5

In order to achieve this capability, a process needs to have an infrastructure available that fulfills stated needs, and adequate human resources. The related Generic Practices are:

GP3.1 Define policies and procedures at an IT level.

10 Policies, standards, and procedures are established at an IT level for common use throughout the operations environment.

GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly. This includes:

15

Identifying the standard process from those available in the IT organization that is appropriate to the process purpose and the business goals of the IT organization.

Tailoring the standard process to obtain a defined process appropriate for the task at hand, implementing the defined process to achieve the process purpose consistently and repeatedly, and to support the business goals of the organization.

20

Process Attribute

ATT 3B: Process Definition - the extent to which the execution of the process uses a definition, based upon a standard process, that enables it to contribute to the defined business goals of the IT organization.

25

In order to achieve this capability, a process needs to be executed according to a standard definition that has been suitably tailored to the needs of the process instance. The standard process needs to be capable of supporting the stated business goals of the IT organization. The related Generic Practices are:

30

GP3.3 Plan for human resources proactively.

Unlike training at Capability Level 2, this practice embodies the pro-active planning of personnel. This includes the selection of proper work forces, training, and dissemination.

GP 3.4 Provide feedback in order to maintain knowledge and experience.

The standard process repository is to be kept up-to-date, through a continuous feedback system based on experiences gained from using the defined process.

5

Level 4: Quantitatively Controlled

At this Level, processes and services are quantitatively measured, understood, and controlled. Detailed measures of performance are collected and analyzed.

10 Establishing common processes within an operations environment enables more sophisticated methods of performing activities. These activities include controlling processes and results quantitatively; integrating processes across groups, or fine-tuning processes to different services.

15 At this Level, measurable process goals are established for each defined process and associated services. Detailed measures of performance are collected and analyzed. This data enables quantitative understanding of the processes and an improved ability to predict performance. Performance is objectively managed, the quality of services is quantitatively known, and defects are selectively identified and corrected.

20 Process Attribute

ATT 4A: Process Measurement - the extent to which measures are used to ensure that the implementation of the process supports its execution, and contributes to the achievement of IT organizational goals.

25 In order to achieve this capability, a process needs to have defined measures that enable an execution to be controlled. The related Generic Practices are:

GP4.1 Establish measurable quality objectives for the operations environment.

30 These quality objectives can be tied to the strategic quality goals of the IT organization, the particular needs and priorities of the customer, or the tactical needs of a specific group or project. The measurements referred to here go beyond the traditional service level and end product measurements. They are intended to imply sufficient understanding of the processes being used to enable the IT organization to set and use intermediate goals for work-product quality.

GP4.2 Automate data collection.

Process definitions are modified to reflect the quantitative nature of process performance.

Measurements become inherent in the process definition and are collected as the process is being performed.

5

Process Attribute

ATT 4B Process Control - the extent to which the execution of the process is controlled through the collection and analysis of measures that correct the performance of the process in order to reliably achieve the defined process goals. The related Generic Practices are:

10

GP4.3 Provide adequate resources and infrastructure for data collection.

Since the success of Level 4 lies fundamentally on collection of proper data, automated methods should be in place to collect them. This includes software tools and meaningful placement of appropriate metrics for collection of the relevant data.

15

GP4.4 Use data analysis methods and tools to manage and improve the process.

This includes the identification of analysis and control techniques appropriate to the process; the provision of adequate resources and infrastructure for analysis and process control; analysis of available measures to identify process control parameters; and, identification of deviations and employment of corrective actions.

20

Level 5: Continuously Improving

Level 5 is the highest achievement level from the viewpoint of Process Capability.

Continuous process improvement is enabled by quantitative feedback from the process and from pilot studies of innovative ideas and new technology. A focus on widespread, continuous improvement should permeate the IT organization. The IT organization should establish quantitative performance goals for process effectiveness and efficiency, based on its business goals and strategic objectives.

25

30

Once critical business objectives are consistently evaluated and compared against process capability, continuous improvement can be institutionalized within the operations environment. This results in a cycle of continuous learning.

Process Attribute

ATT 5A: Continuous Improvement - the extent to which changes to the process are identified and implemented to ensure continuous improvement in the fulfillment of the defined business goals of the IT organization.

5 In order to achieve this capability, it is necessary to continuously identify and implement improvements to the tailored process, and provide input to make changes to the standard process definition. The related Generic Practices are:

GP5.1 Continually improve tasks and processes

10 Improvements may be based on incremental operational refinements or through innovations, such new technologies. Improvements may typically be driven by the following activities:

- Identifying and approving changes to the standard process definition on the basis of quantitative understanding of the process.
- Providing adequate resources to effectively implement the approved changes in affected tailored processes.
- 15 • Implementing the approved changes to the affected tailored processes.
- Validating the effectiveness of process change on the basis of measurement of actual performance against the process and business goals.

20 Process Attribute

ATT 5B: Process Change - the extent to which changes to the definition, management, and performance of the process is controlled to better achieve the business goals of the IT organization.

25 In order to achieve this capability, a process may use quantitative methods to identify and implement changes to the standard process definition. The related Generic Practices are:

GP5.2 Deploy “best practices” across the IT organization.

Improved practices must be deployed across the operations environment to allow their benefit to be felt across the IT organization. The deployment activities include:

30 Identifying improvement opportunities in a systematic and proactive manner to continuously improve the process.

Establishing an implementation strategy based on the identified opportunities to improve process performance according to business goals. Implementing changes to selected areas of the tailored process according to the implementation strategy.

- 5 Validating the effectiveness of process change on the basis of measurements of actual performance against process and business goals, and then feedback to the standard process definition.

Rating Framework

- 10 The rating framework requires identification of objective attributes or characteristics of a practice or work product of an implemented process to validate that Base Practices are performed, and Generic Practices are followed. Assessment Indicators determine Process Attribute ratings which then are used to determine Capability Level.

- 15 In the present description, Assessment Indicators refer to objective attributes or characteristics of a practice or work product that supports an assessor's judgment of performance of an implemented process.

Process Capability Rating

- 20 The cornerstone of a rating framework is the identification and description of Assessment Indicators to help rate the Process Attributes. Assessment Indicators are objective attributes or characteristics of a practice or work product that supports an assessor's judgment of performance of an implemented process. Assessment Indicators are evidence that Base Practices are performed, and Generic Practices are followed. The indicators are not intended to be regarded as
25 a mandatory checklist to be followed, but rather are a guide to enhance an assessment team's objectivity in making their judgments of a process's performance and capability. The rating framework adds definition and reliability to the present invention, and thereby improves repeatability.

- 30 Assessment Indicators are determinants of Process Attribute ratings for each Process Capability attribute. Each assessed process profile consists of a set of Process Attribute ratings. Each attribute rating represents a judgment by the assessment team of the extent to which the attribute is achieved.

Figure 8 illustrates the Process Attribute rating represented on a four-point scale of achievement.

The indicators determine attributes rating which then are used to determine Capability Level.

The rating scale defined below is used to describe the degree of achievement of the defined

5 capability characterized by Process Attributes. Once the appropriate rating for each Process

Attribute is determined, ratings can be combined to assign the Capability Level achieved by the

assessed process. Figure 9 represents the mapping of attribute ratings to the process Capability

Levels determination.

10 As an example, to assess the capability of a particular instance of a Service Desk process, the

first step is to identify if the appropriate Base Practices are performed at all. The necessary

foundation for improving the capability of any process is to at least demonstrate that the Base

Practices are being performed. The assessment team may then formulate an objective judgment

of process performance attribute through different means such as analysis of the work products

15 (i.e., reviewing completed trouble tickets), demonstration of evidence of process

implementations (i.e., are escalation procedures documented and understood?), interviews with

process performers (i.e., discuss daily activities with Service Desk personnel), and other means

as appropriate (i.e., does the Service Desk have a dedicated phone number that users should call
to report incident/problems/requests or a dedicated email address, etc.).

20 Achievement of Base Practices is an indication that Process Area goals are being met. The

increasing capability of a process to effectively achieve its goals and objectives is based upon

attribute rating. The attribute rating is determined by the performance of the associated Generic

Practices. Evidence of effective performance of the Generic Practices associated with a Process

25 Attribute supports the assessment team's judgement of the degree of achievement of the

attributes.

Operational Maturity Rating

Up to now, the discussion has focused on the capability rating of Process Areas. To determine

30 the maturity level of an organization, the third dimension of the architecture of the present

invention, the capability ratings are used.

Process Category capabilities are determined from capability ratings of its Process Areas. Once

all Process Areas of a category are rated the lowest rating assigned to a Process Area becomes

the category rating as well. Similarly, the operational maturity rating is determined from Process Category rating within the IT organization. Once all Process Categories are rated then the lowest rating assigned to a Process Category becomes the IT organizational maturity.

5 For example, if the Process Categories of an IT organization are rated as follows, then this particular IT organization would receive a maturity level rating of “1”.

	<u>Process Category</u>	<u>Capability Rating</u>
	Service Management	2
10	Systems Management	1
	IT Operations Planning	3
	Managing Change	2

15 In the present invention, the concept of capability is applied to processes, and the concept of maturity is applied to IT organizations.

Assessment Process

20 In performing an assessment, an assessment team collects the evidence on the implementation of the processes being assessed and determines their compatibility as defined in the framework of the present invention. The objective of the assessment is to identify the differences and the gaps between the actual implementations of the processes in the assessed operational IT organization with respect to the present invention. Using the framework of the present invention ensures that results of assessments can be reported in a common context and provides the basis on which comparisons can be based.

25 The assessment process is used to appraise an organization’s IT operations environment process capability. Defining a reference model ensures that results of assessments can be reported in a common context and provides the basis on which comparisons can be based.

30 An IT organization can perform an assessment for a variety of reasons. An assessment can be performed in order to assess the processes in the IT operations environment with the purpose of improving its own work and service processes. An IT organization can also perform an assessment to determine and better manage the risks associated with outsourcing. In addition, an assessment can be performed to better understand a single functional area such as systems

management, on a single process area such as a performance management, or on the entire IT operations environment.

5 Three phases are defined in the assessment model: Planning and Preparing, Performing, and Distributing Results. All phases of the assessment are performed using a team-based approach. Team members include the client sponsor, the assessment team lead, assessment team members, and client participants.

Plan and Prepare for the Assessment

Determine Assessment Scope

10 In the present description, assessment scope refers to organizational entities and components selected for inspection. A clear understanding of the purpose of the framework, constraints, roles, responsibilities, and outputs are needed prior to the start of the assessment. Therefore, in preparation for the assessment, the assessment team lead and the client sponsor work together to reach agreement on the scope and goals of the assessment. Once agreement is reached, the assessment team lead ensures that the IT operational processes selected for the assessment are sufficient to meet the assessment purpose and may provide output that is representative of the assessment scope.

20 An assessment plan is developed based on the goals identified by the client sponsor. The plan consists of detailed schedules for the assessment and potential risks identified with performing the assessment. Assessment team members, assessment participants, and areas to be assessed are selected. Work products are identified for initial review, and the logistics for the on-site visit are identified and planned.

Train the Assessment Team

25 The assessment team members must receive adequate training on the framework of the present invention and the assessment process. It is essential that the assessment team be well-trained on the present invention to ensure that they may have the ability to interpret the data obtained during the assessment. The team must have comprehensive understanding of the assessment process, its underlying principles, the tasks necessary to execute it, and their role in performing the tasks.

Gather Assessment Input

5 Maturity questionnaires are distributed to participants prior to the client site visit. Maturity questionnaires exist for each process area of the present invention, and tie back to base practices, process attributes and generic practices. Completed questionnaires provide the assessment team with an overview of the IT operational process capability of the IT organization. The responses assist the team in focusing their investigations, and provide direction for later activities such as interviews and document reviews. Assessment team members prepare exploratory questions based on Interview Aids and responses to the maturity questionnaires.

10 In the present description, Interview Aids refers to a set of exploratory questions about the operations environment which are used during the interview process to obtain more detailed information on the capability of the IT organization. The interview aids are used by the assessment team to guide them through interview sessions with assessment participants.

15 Assessment participants prepare documentation for the assessment team members to review. Documentation about the IT operational processes allows the assessment team to tie IT organization data to the present invention.

Conduct Assessment

20 A Kick off meeting is scheduled at the start of the on-site activities. The purpose of the meeting is to provide the participants with an overview of present invention and the assessment process, to set expectations, and to answer any questions about the process. A client sponsor of the assessment may participate in the presentation to show visible support and stress the importance of the assessment process to everyone involved.

Gather Data

25 Data for the assessment are obtained from several sources: responses to the maturity questionnaires, interview sessions, work products, and document reviews. Documents are reviewed in order to verify compliance. Interviewing provides an opportunity to gain a deeper understanding of the activities performed, how the work is performed, and processes currently in use. Interviewing provides the assessment team members with identifiable assessment indicators for each Process Area appraised. Interviewing also provides the opportunity to address all areas
30 of the present invention within the scope of the assessment.

Interviews are scheduled with IT operations managers, supervisors, and operations personnel. IT operations managers and supervisors are interviewed as a group in order to understand their view of how the work is performed in the IT organization, any problem areas of which they are aware, and improvements that they feel need to be made. IT operations personnel are interviewed to collect data within the scope of the assessment and to identify areas that they can and should improve in the IT organization.

Examples of maturity questionnaires associated with the foregoing service desk example are as follows:

Questions
Base Practice: 1.3.1 Call Attention
What methods are available to users for communication with the Service Desk, and do users have access to resources needed for such communication?
Are all users informed how and when to contact the Service Desk? If so, how?
Do all users receive the same level of support? If no, how does support differ?
Do you gather call statistics like total volume of calls and number of abandoned calls? If so, can we access this information?
Is there a need for after-hours support? If so, what type of after-hours support does the Service Desk provide?
Base Practice: 1.3.2 Incident/Request Logging
1. What is the procedure for logging incidents/requests, and is this followed in all cases?
Is a priority level assigned to the incident/request at time of receipt and how is it determined?
Base Practice: 1.3.3 Incident/Request Qualification
Do Service Desk personnel have access to a catalogue/database of frequently occurring incidents and their solutions, and does its format allow for rapid access and search?
How often is this catalogue/database accessed to provide an immediate solution or work-around to the user? (e.g., all calls, some calls, very few calls)
How frequently is this catalogue/database updated?
What other resources exist to aid Service Desk personnel with immediate incident resolution?
Base Practice: 1.3.4 Incident/Request Assignment
Is there a defined time frame within which the incident/request should be assigned and is it usually followed?
Are users notified of receipt, status and approximate time to resolution (if possible) of incident/request and provided with the incident/request ID?
By what process is the appropriate personnel determined for handling an incident/request?
Is a defined system used for assigning responsibility for an incident/request to the appropriate personnel? (e.g. trouble tickets are generated and sent to appropriate personnel)
Is a record made of the person to whom the incident/request is assigned?
Base Practice: 1.3.5 Incident & Problem Resolution
Are non-resolved incidents/problems escalated according to procedures defined in SLAs?
2. How are appropriate resources notified that the incident/problem has been escalated?
While problem resolution is in process, is a work-around solution determined and conveyed to the user?
When a problem is escalated or a resolution has been determined, is the log updated?
Does the Service Desk or the party to whom the problem was escalated "own" the problem?
Base Practice: 1.3.6 SLA & OLA Tracking and Monitoring
What is the system for tracking and monitoring the problem resolution process for an incident/request?
What types of issues (e.g. excessive reassignments, deviations from estimated task times) are flagged and what action is taken to address them?
Base Practice: 1.3.7 Resolution Confirmation
Are users notified of incident/request resolution?

Is confirmation sought from the user to verify that incident/request has been resolved satisfactorily?
If such confirmation is not obtained what is done?
Base Practice: 1.3.8 Incident / Request Closure
How is an incident/request closed? What records are made?
If it exists, is a solution database updated with the incident/problem and solution for future reference?
What parties are informed of a closure?
Base Practice: 1.3.9 Trends and Repetitive Incident Analysis
Are incidents analyzed to detect trends and identify underlying problems? If so, by what process?
Are users notified of known incidents proactively before they report the incident?
Base Practice: 1.3.10 Service Level Control
Does the Service Desk generate reports comparing actual service levels (eg. Number of incidents resolved at initial call, resolution time by severity) with target service levels?
Who receives these reports and for what purposes?
How are service levels targets set and what is the process for reviewing/updating them?
Do the users communicate their views of support to the Service Desk and agree with the Service Desk's assessment of incident and problem management?
Base Practice: 1.3.11 Receive Requests
Are requests handled immediately or do they require provisioning/approval?
Does the Service Desk coordinate the approval of requests with the appropriate functions and notify requester of approval/rejection?
If request requires functions outside the Service Desk, how does the Service Desk pass responsibility to the appropriate personnel?
Do SLAs exist between the Service Desk and the end user community?
Do agreements exist between the Service Desk and the next level of support (internal or external)?
Generic Questions for Process Area
Are the policies for Service Desk operation outlined in a document? How are employees made aware of these policies?
What mechanisms are in place to ensure policies are followed?
How frequently are Service Desk policies reviewed and/or modified? What is the process for such policy updates?
Are the current staff and resources of the Service Desk adequate for satisfactorily meeting user needs.
What type of qualification and/or training do Service Desk personnel have?
Are Service Desk operations periodically reviewed in order to identify and implement potential improvements? Who manages this process?

Solidify Information

5 The purpose of solidifying this information is to summarize and consolidate information into a manageable set of findings. The data is then categorized into Process Areas of the present invention. The assessment team must reach consensus on the validity of the data and whether sufficient information in the areas evaluated has been collected. It is the team's responsibility to obtain sufficient information on the components of the present invention within the scope of the assessment for the required areas of the IT organization before any rating can be done. Follow-up interviews may occur for clarification.

15 Initial findings are generated from the information collected thus far, and presented to the assessment participants. The purpose of presenting initial findings is to obtain feedback from the individuals who provided information during the various interviews. Ratings are not considered until after the initial findings presentations, as the assessment team is still collecting data. Initial

findings are presented in multiple sessions in order to protect the confidentiality of the assessment participants. Feedback is recorded for the team to consider at the conclusion of all of the initial findings presentations.

5 Examples of assessments associated with the foregoing service desk example are as follows:

Level 1

Base Practice	Example of Assessment Indicator
1.3.1 Call attention	Service Desk has a direct number for users to call. Users are able to send requests or report problems via an email address set up for the Service Desk. Users aware of all options available to them to contact the Service Center.
1.3.2 Incident/request logging	The Service Desk has an automated problem management system.
1.3.3 Incident/request qualification	A categorization or prioritization scheme in place.
1.3.4 Incident/request assignment	A process is in place for re-assignment of incidents & requests for instances when the Service Desk can't resolve the problem. The problem management system is set up to handle re-assignment.
1.3.5 Incident & problem resolution	An escalation process is defined and in place. Support staff are able to describe the process.
1.3.6 SLA & OLA tracking and monitoring	SLA/OLA Reports exist. The staff knows and understands the service levels required of them.
1.3.7 Resolution confirmation	Call backs to the user are performed and tracked.
1.3.8 Incident/request closure	A solution database for problems exists and is used by the Service Desk staff.
1.3.9 Trends and repetitive incidents analysis	Are there any trending reports? Does staff tie back incidents to problems?
1.3.10 Service level control	Service level reports exist. Staff is aware of how well they are performing in regards to service levels.
1.3.11 Receive requests	If the Service Desk responsible for handling requests, a different schema / screen exists in the problem management system for requests.

10

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator
Performance Management	GP2.1 Establish and maintain a policy for performing the process	Policy for hours of operation exists and is followed. Standard applications are supported, and Service Desk staff know what is supported.
	GP2.2 Allocate adequate resources for performing the process	All Service Center personnel have access to the problem management software when they need it (vs. the Service Desk having an insufficient number of floating licenses) The staff has the required access and permissions to perform their jobs. Supervisor of the Service Desk uses a staffing plan, and has an acceptable ratio of support personnel to users.

	GP2.3 Ensure adequate people skill	Training policy in place for new staff members. The organization provides training on all technologies supported.
	GP2.4 Measure process	Metrics are collected, for example: resolution time, response rate, etc.
	GP2.5 Coordinate and communicate	Issues are tracked and logged. The team provides status reports
Work Product Management	GP2.6 Verify adherence of work products to the applicable requirements	All fields in a trouble ticket completed, rather than staff members typically leaving some fields blank.
	GP2.7 Manage the configuration of work products	Different databases exist for different environments. For example, a database for incidents and problems in the test environment; one for the development environment, etc.

Level 3

Process Attribute	Generic Practice	Example of Assessment Indicator
Process Definition	GP3.1: Define and establish adequate process infrastructure	There is one centralized Service Desk for the entire organization,(vs. each department has their own) The Service Desk support a standard list of hardware and software, and all end users are informed of them.
	GP3.2 Provide adequate human resource competencies	New employees receive training on the Service Desk process (problem and request management) Tier 2 and 3 support staff are trained on the Help Desk tools and process
Process Resource	GP3.3: Perform the process according to a defined process	Requests are always handled according to the stated policy (vs. people frequently circumvent the process)
	GP3.4 Provide feedback	The Service Desk distributes surveys to determine how their users view their services. The Service Desk manager solicits feedback from the team, and from Tier 2 and Tier 3 support staff.

5

Level 4

Process Attribute	Generic Practice	Example of Assessment Indicator
Process Measurement	GP4.1 Establish measurable quality objectives for the services of the operations environment's standard and defined processes	Service levels are based on strategic business needs vs. industry standards.
	GP4.2 Determine the quantitative process capability of the defined process	Metrics are automatically collected from the problem management tool (vs. collected manually)
	GP4.3 Provide adequate resources and infrastructure for data collection	Ties to systems management are in place. Tickets are automatically created when systems management tools detect faults. Adequate resources are in place to analyze and report on Service Desk data.
Process Control	GP4.4 Use the quantitative process capability to manage the process	Service levels are revised after reviewing actual data on Service

		Center performance (response rates, resolution rates, etc.)
--	--	---

Level 5

Process Attribute	Generic Practice	Example of Assessment Indicator
Continuous Improvement	GP5.1: Continually improve process	The Service Center practices “call avoidance” to some extent (problems being automatically fixed by tools, or fixed prior to users calling them in?) New technologies are looked into for use on the Service Desk. Surveys results are used to understand the users’ perception of the Service Desk, and results are used to improve service. Service Desk staff are active in Help Desk organizations, such as HDL.
Process Change	GP 5.1:Deploy “best practices” across the IT organization	Users have access to knowledge base tools on the LAN / intranet that allow them to try to resolve things on their own.

5

Rating

After the assessment team consolidates all of the data, the rating process may begin. The experience and training that the assessment team has provides them with the knowledge needed to interpret the data obtained during the assessment. The first step in the rating process is to determine if Process Area goals are being met. Process Area goals are considered met when all base practices are performed. Each process attribute for each Process Area within the assessment scope is then rated. Process attributes are rated based on the existence of and compliance to generic practices. Using the Assessment Indicator Rating template, the assessment team identifies assessment indicators for each process area to determine whether or not process attributes are achieved. Ratings are always established based on consensus of the entire assessment team. Questionnaire responses, interview notes, and documentation are used to support ratings; confirmation from two sources in different contexts (e.g., two people in different meetings) ensures compliance of an activity.

For each process attribute, the team reviews all weaknesses that relate to the associated generic practices. If the team determines that a weakness is strong enough to impact the process attribute, the process attribute is rated “not achieved.” If it is decided that there are no significant weaknesses that have an impact on a process attribute, it is rated “fully achieved.” For a Process Area to be rated “fully achieved,” all process attributes for the Process Area must be rated “fully

achieved.” A Process Area may be rated fully achieved, largely achieved, partially achieved, or not achieved.

5 Assignment of a maturity level rating is optional at the discretion of the sponsor. For a particular maturity level rating to be achieved, all Process Areas within and below the maturity level must be satisfied. For example, for an IT organization to be rated at maturity level 4, all Process Areas at level 4, level 3 and at level 2 must have been investigated during the assessment, and all Process Areas must have been rated achieved by the assessment team. The final findings presentation is developed by the team to present to the sponsor and the IT organization the strengths and weaknesses observed for each Process Area within the assessment scope, the ratings of each Process Area, and the maturity level rating if desired by sponsor.

Wrap up and Distribution of Results

15 The final assessment results are presented to the client sponsor. During the final presentation, the assessment team must ensure that the IT organization understands the issues that were discovered during the assessment and the key issues that it faces. Operational strengths are presented to validate what the IT organization is doing well. Strengths and weaknesses are presented for each process area within the assessment scope as well as any issues that affect process and are un-related to the present invention. A Process Area profile is presented showing the individual Process Area ratings in detail.

25 An executive overview session is held in order to allow the senior IT Operations manager to clarify any issues with the assessment team, to confirm his or her understanding of the operational process issues, and to gain full understanding of the recommendations report.

When the assessment has been completed and findings have been presented, the assessment team collects feedback from the assessment participants and the assessment team on the process, packages information that needs to be saved for historical purposes.

30 Figure 10 describes the roles and responsibilities of those involved with the assessment process. As shown, various roles that may be involved with the execution of the present invention include a client sponsor, assessment participants, an assessment team leader, and assessment team members. It should be noted that any of such roles and responsibilities may be automated per the desires of the user.

Figure 11 represents the indicator types and their relationship to the determination of Process Area rating. As shown, evidence of process performance and process capability is provided by assessment indicators. Such assessment indicators, in turn, consist of base practices and general practices. At the next level, the base practices and general practices are assessed by process implements, work products, practice performance, resources and infrastructure.

A plurality of examples of additional process areas and associated generic/base practices will now be set forth. In addition, maturity questionnaires are also provided for each example. Given this information, the foregoing principles of the present invention may be employed for determining capability levels of various process areas for process assessment purposes in an operational maturity investigation.

SLA Management (1.1)

PA Number	1.1
PA Name	SLA Management
PA Purpose	<p>S</p> <p>LA Management involves the creation, management, reporting, and discussion of Service Level Agreements (SLAs) with users and the providers within Information Technology (IT). A SLA is a formal agreement between a user who requires information services and the IT organization responsible for providing those services. SLA Management involves the following areas:</p> <p><i>SLA Definition:</i> The SLA document defines, in specific and quantifiable terms, the level of service that is to be delivered to users. In the enterprise environment, many design and configuration alternatives are available that affect a given system's response time, availability, development cost, and ongoing operational costs. A SLA clarifies the business objectives and constraints for an application system, and forms the basis for both application design and system configuration choices.</p> <p><i>SLA Reporting:</i> The actual production of trend reports is necessary to monitor and meter the effectiveness of a SLA.</p> <p><i>SLA Control:</i> It is important that the services described in SLAs are carefully aligned with current business needs, monitored to ensure that they are performed as described, and updated in line with changes to business needs.</p> <p><i>SLA Review:</i> The reports generated from tracking SLAs are reviewed to ensure that the SLAs are carefully aligned with current business needs and if necessary updated to be in line with business needs. In enterprise environments, this process becomes more complex as more components are required to perform these services.</p>
PA's Base Practices	<p>1.1.1 Assess business strategy</p> <p>1.1.2 Audit current service levels</p> <p>1.1.3 Determine service requirements</p> <p>1.1.4 Determine ability to deliver services; tie to Capacity Planning</p> <p>1.1.5 Prepare draft SLA</p> <p>1.1.6 Identify charge back, budget, or costing structure components</p> <p>1.1.7 Agree to SLAs with users</p> <p>1.1.8 Report on SLA performance</p>

PA Goals	To define services to be delivered (by application and/or business unit). To define a quantifiable service level that represents a minimum level of service for each service delivered. To gather and compare actual service statistics, and to identify and resolve service deviations. To regularly review services being delivered and determine if they are appropriately fulfilling SLA requirements. To ensure IT can deliver services required by the business. To regularly report on SLA compliance.
PA's Metrics	Percentage of SLAs signed off on time Number of iterations of the SLA before sign off Percentage of SLAs not signed off at the same time as the corresponding OLAs. Percentage of SLA Reports delivered on time

Base Practices

BP Number	1.1.1
BP Name	Assess business strategy
BP Description	The purpose of this activity is to gain an understanding of the business strategy. This understanding can simplify the creation of service goals and provide insight for formulating the appropriate service strategy.
Example	<i>Interviewing and surveying IT members on what they understand the business strategy to be is one way to start identifying service goals.</i>
BP Number	1.1.2
BP Name	Audit current service levels
BP Description	The purpose of this activity is to examine the IT organization's processes, environment, and structure, and to determine how well the current services support the business strategy. Auditing the current level of service provides the basis for determining which services the IT organization will provide and how they will be provided. The audit must identify all services provided and the users receiving those services.
Example	<i>Examples of areas to be audited include current Service Desk responses, network performance, server downtime, server/network/application response time, etc.</i>
BP Number	1.1.3
BP Name	Determine service requirements
BP Description	The specific services and service levels required to support the business strategy must be defined. The outcome of this activity should be a definition of service requirements that specifies all service items and their associated service levels. Key Performance Indicators (KPIs) and metrics are defined in order to measure service levels.
Example	<i>Users and providers of IT services meet to discuss levels of service. Requirements and abilities can be obtained via questionnaires, interviews, and open-ended discussions.</i>
BP Number	1.1.4
BP Name	Determine ability to deliver services; tie to Capacity Planning
BP Description	The purpose of this activity is to understand IT's ability to deliver the required services and to understand IT's capacity. Those responsible for determining IT's capability should work closely with the Capacity Planning & Modeling process.
Example	<i>Current service levels, staffing, and technology are gathered and analyzed in order to understand IT's ability to deliver services.</i>
BP Number	1.1.5
BP Name	Prepare draft SLA
BP Description	A draft SLA, based on the defined requirements should be created. SLAs are generally created by application. If there is a significant difference in the service requirements between user groups, separate SLAs should be drafted for each user group. The draft SLA will drive the process of identifying and selecting suppliers to support the service requirements. The SLA should not be finalized until suppliers have been found to support the requirements outlined in the SLA.
Example	<i>Business requirements, provider abilities, and user needs gathered via surveys, meetings, and audits are reviewed in order to write a draft SLA. Negotiation between interested parties occurs until agreement is reached.</i>
BP Number	1.1.6
BP Name	Identify charge back, budget or costing structure components
BP Description	A charge back structure should be determined. If a charge back structure is not used, a

	budget or costing structure should be in place.
Example	<i>Penalties and rewards are a necessary part of SLAs. One way to implement such measures is by creating a charge back structure. For example, if the Service Desk does not respond to incidents in the required time frame, a potential penalty would be discounted or free service for the affected users for a specified amount of time.</i>
BP Number	1.1.7
BP Name	Agree to SLAs with users
BP Description	Final approval should be obtained from the parties involved in the SLA agreement process. This will be representatives from the IT organization, client management, and the users.
Example	<i>Generally, IT and users will agree on a trail period (3 to 6 moths) to baseline services. When it is determined that the service levels are realistic and attainable, the SLA can be finalized.</i>
BP Number	1.1.8
BP Name	Report on SLA performance
BP Description	Once SLAs are finalized and put into place, reporting on KPIs and metrics is performed to determine whether or not the required service levels are being met.
Example	<i>Reporting on service levels is provided to users. Generally, reports are distributed on a weekly or monthly basis, and users are given the opportunity to discuss the reports with IT service providers.</i>

References

	MODE SLA/OLA Management Practice Aid
	MODE Version 2
	Introduction to Service Level Agreements White Paper
	MODE v1 Toolkit

Process Area: SLA Management

Level 1

5 Assessment Indicators: Process Performance

Generic Practice: Ensure that Base practices are performed

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
1.1.1 Assess business strategy	<i>When questioned, IT members can correctly identify the business strategy.</i>	
1.1.2 Audit current service levels	<i>Report of audit on existing service levels that was performed. Document may include metrics on performance or service levels (e.g server downtime).</i>	
1.1.3 Determine service requirements	<i>Documentation exists of all service items and their associated service levels. Meeting minutes exist for meetings that were held between users and providers regarding service levels.</i>	
1.1.4 Determine ability to deliver services; tie to Capacity Planning	<i>Documentation describing service capability is available.</i>	
1.1.5 Prepare draft SLA	<i>An SLA document exists.</i>	
1.1.6 Identify charge back structure	<i>A chargeback algorithm or strategy is in place and a document (e.g. memo) describing it is available.</i>	
1.1.7 Agree to SLAs with users	<i>Prior to being finalized, SLAs were reviewed with users and their approval obtained. Signed off SLA document exists.</i>	
1.1.8 Report on SLA performance	<i>Regular reporting on SLA performance occurs. Reports include predefined metrics and KPIs.</i>	

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance	GP2.1 Establish and maintain a	<i>Policies exist that outline the</i>	

Management	policy for performing operational tasks	<i>consequences of deviations from SLA requirements – penalties for under-performance and rewards for exceptional performance.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>Reporting on SLA performance occurs as scheduled and necessary information can be collected. The reports should reflect that the SLA performance is due to having the appropriate people, skill and resources.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>Users are informed of SLAs and the process for addressing service level issues that they might identify. Designated personnel form a SLA management team that monitors and controls existing and new SLAs. The personnel have experience and/or received training in issues related to SLA management.</i>	
	GP2.4 Collect data to measure performance	<i>Performance metrics detailed in SLAs are collected.</i>	
	GP2.5 Maintain communication among team members	<i>Particular personnel are designated as being responsible for controlling and managing SLAs. They serve as a point of contact for users to raise concerns.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>SLAs contain all necessary items such as description of services, KPIs/performance metrics, consequences of deviations etc.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>If multiple SLAs exist, they all are in accordance with predefined standards and guidelines. Each SLA is monitored and controlled separately and changes are duly noted.</i>	

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an IT level	<i>Mechanisms for collecting SLA compliance data are present and utilized. All parties affected by SLAs are aware of procedures and channels for raising any concerns.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>Plans are created for work force additions and/or competency enhancements based on SLA requirements and projected changes (e.g. growth, new needs) in user community.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>Documented procedures are always followed for escalating or resolving incidents arising from service level deviations.</i>	
	GP3.4 Provide feedback in	<i>Users complete surveys aimed at</i>	

	order to maintain knowledge and experience	assessing the satisfaction with service levels.	
--	--	---	--

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	Targets are regularly set for KPIs and other metrics. Actual measures are compared against these targets.	
	GP4.2 Automate data collection	Metrics are drawn from data collected by the Service Desk.	
	GP4.3 Provide adequate resources and infrastructure for data collection	Adequate resources are in place to analyze and report on SLA performance data.	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	Appropriate steps are taken to address discrepancies between actual service levels and the targets set.	

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	The SLA management team regularly meets to evaluate SLAs given the business goals and strategy. If necessary, appropriate modifications are discussed.	
Process Change	GP 5.1: Deploy "best practices" across the IT organization	If service requirements differ between groups, separate SLAs are created, but the same monitoring/reporting procedures are followed. Improvements or changes are implemented throughout the IT organization.	

5

Process Capability Assessment Instrument: Interview Guide

Process Area	1.1 SLA Management
--------------	--------------------

Questions
Base Practice: 1.1.1 Assess Business Strategy
What actions are taken to incorporate the business strategy into the process of defining service goals and strategy?
What relevant components are drawn from the business strategy (e.g. service measures, volume projections, workloads etc.)?
What parties are involved in this process?
Is there any tie with capacity management and planning? If so, please describe the tie.
How often is the strategy assessed?
Base Practice: 1.1.2 Audit Current Service Levels
As part of the SLA preparation process, what is the procedure for auditing existing service levels? What information is gathered? Is this process carried out in accordance with predefined guidelines?
Which service areas are audited?
Who carries out the audit and who receives the audit results?
What type of report or document is the output of the audit process?
Base Practice: 1.1.3 Determine Service Requirements

What is the process by which service requirements are defined? Who is involved in this process?
Do the service requirements specify all service items and their associated service levels?
Are Key Performance Indicators (KPIs) and metrics for evaluating service levels determined?
How often are service requirements revisited?
Base Practice: 1.1.4 Determine Ability to Deliver Services
Prior to preparing the SLAs, how was IT's ability to deliver services gauged?
Was capability evaluated in all service areas? What types of information were considered?
Did this process involve the Capacity Planning & Modeling function?
In what form were the capability evaluation results reported, to whom and for what purposes?
Base Practice: 1.1.5 Prepare Draft SLA
What is the procedure for drafting SLAs? What parties are involved?
What does the SLA contain (e.g. specific applications, workload, cost of service, measure of service, type of support etc.)?
Does the SLA outline each key business application (e.g. penalties for SLA violation, tools to maintain SLAs, manager/owner of SLA etc.)?
Are separate user groups determined based on different service requirements and unique SLAs created for each group? If so, do standard guidelines exist?
Does the process of preparing SLAs include identifying potential suppliers to support the service requirements?
Are provisions for normal/contingency/disaster conditions specified in the SLA?
Are monitoring and reporting procedures defined?
Are escalation procedures defined for instances when SLAs are not met?
Has what constitutes a failed SLA and the penalties for failure been determined?
Are provisions for rewards made for cases when service exceeds requirements?
Base Practice: 1.1.6 Identify Charge Back, Budget or Cost Structure Components
Was a chargeback structure determined as part of the SLA preparation process? If so, for what components is the chargeback determined?
How is the chargeback structure utilized in relation to service level management?
Do you have or do any budgeting or costing that is used in SLA management?
Base Practice: 1.1.7 Agree to SLAs with Users
To what parties are SLAs submitted for approval?
How is approval of the SLA documented?
Where is information about the finalized SLA stored? Are SLA summaries available to users?
Is there a system for users to communicate desired changes to services provided?
Base Practice: 1.1.8 Report on SLA Performance
Are actual statistics required to measure service delivery gathered and in what format are they stored?
Is information on service delivery collected according to prescribed schedules?
Are actual service statistics compared to targets defined in the SLAs?
Are users' input on SLA performance obtained (e.g. surveys)?
What types of reports are produced based on the statistics gathered?
Who reviews these reports and what is the process for ascertaining SLA compliance?
What procedures are in place to monitor and address SLA breaches?
Does the need for short-term deviations to SLAs due to business requirements arise, and how is it managed?
Generic Questions for Process Area
How often are SLAs re-examined and updated? Approximately how many hours are allocated to review and discuss SLAs?
Are there personnel who control and manage new and existing SLAs? What relevant qualifications and/or training do they have?
Do you think the resources allocated to managing SLAs are adequate? Please explain.
Is the SLA management process periodically evaluated with the intent of identifying possible improvements? How frequently does this occur and what is the process?

Process Area	1.1 SLA Management
Process Area Description	<p>SLA Management involves the creation, management, reporting, and discussion of Service Level Agreements (SLAs) with users and the providers within Information Technology (IT). A SLA is a formal agreement between a user who requires information services and the IT organization responsible for providing those services. SLA Management involves the following areas:</p> <p><i>SLA Definition:</i> The SLA document defines, in specific and quantifiable terms, the level of service that is to be delivered to users. In the enterprise environment, many design and configuration alternatives are available that affect a given system's response time, availability, development cost, and ongoing operational costs. A SLA clarifies the business objectives and constraints for an application system, and forms the basis for both application design and system configuration choices.</p> <p><i>SLA Reporting:</i> The actual production of trend reports is necessary to monitor and meter the effectiveness of a SLA.</p> <p><i>SLA Control:</i> It is important that the services described in SLAs are carefully aligned with current business needs, monitored to ensure that they are performed as described, and updated in line with changes to business needs.</p> <p><i>SLA Review:</i> The reports generated from tracking SLAs are reviewed to ensure that the SLAs are carefully aligned with current business needs and if necessary updated to be in line with business needs. In enterprise environments, this process becomes more complex as more components are required to perform these services.</p>

Questionnaire

Process Area	1.1 SLA Management (Business Relationship Management)
--------------	---

5

		Yes	No	Don't Know	N/A
1	Do you have existing SLAs which define levels of support between the providers of systems and the users?				
2	Is the business strategy examined when formulating IT service goals and strategy?				
3	Are existing service levels audited to evaluate how well they support the business strategy?				
4	Is a procedure followed for determining required services, service levels and Key Performance Indicators (KPIs) for those services?				
5	Is IT's ability to deliver the required services evaluated?				
6	Are SLAs drafted based on the requirements identified?				
7	Is a charge back structure defined and used to assign rewards/penalties based on SLA performance?				
8	Is approval of the draft SLA obtained from all parties involved?				
9	Are KPIs and metrics regularly reported to monitor SLA performance?				

Work Product list

10

Process Area	1.1 SLA Management (Business Relationship Management)
--------------	---

- SLA process flow
- Sample SLA document
- IT capability report
- SLA performance reports
- User survey results
- Charge back structure document

15

Responsibility matrix
 SLA Communication flow
 Job description of SLA manager and staff

5

OLA Management (1.2)

PA Number	1.2
PA Name	OLA Management
PA Purpose	<p>OLA Management involves the creation, management, reporting, and discussion of Operations Level Agreements with providers within the organization, as well as external suppliers and vendors. An OLA is an agreement between the IT organization and those delivering the constituent services of the system. OLAs enable the IT organization to provide the level of service stipulated in a Service Level Agreement as supporting services are guaranteed in the OLA. OLA Management involves the following:</p> <p><i>OLA Definition:</i> An OLA outlines the type of service that will be delivered to the users from each service provider. OLA Definition works with service providers to define: Whether a particular service level can be met, and how it will be met through operational levels Which provider(s) can supply a service, or part of a service Roles and responsibilities What constitutes a failure to meet the OLA, and corresponding penalties (if appropriate) Procedures for monitoring operational levels Cost structures How the service will be measured Contractual arrangements with the providers Formal OLAs are defined for suppliers who are external to the IT organization. They may take the form of maintenance contracts, warranties, or service contracts. Further formal or informal OLAs may also be created for internal suppliers, depending on the size of the organization.</p> <p><i>OLA Reporting:</i> The actual production of trend reports are necessary to monitor and meter the effectiveness of an OLA.</p> <p><i>OLA Control:</i> It is important that the services described in OLAs are carefully aligned with current business needs, monitored to ensure that they are performed as described, and updated in line with changes to business needs.</p> <p><i>OLA Review:</i> The reports generated from tracking OLAs are reviewed to ensure that the OLAs are carefully aligned with current business needs and if necessary updated to be in line with business needs. In enterprise environments, this process becomes more complex as more components are required to perform these services.</p>
PA's Base Practices	1.2.1 Determine operational items 1.2.2 Group related operational items 1.2.3 Identify suppliers of operational items 1.2.4 Finalize service suppliers 1.2.5 Prepare OLAs 1.2.6 Agree to OLAs with suppliers 1.2.7 Report on OLA performance
PA Goals	<p>To define a quantifiable service level that represents a minimum level of service for each service delivered.</p> <p>To gather and compare provider service statistics, and to identify and resolve service deviations.</p> <p>To regularly review services being delivered, as specified in the OLA, to determine if they are appropriately fulfilling the requirements.</p> <p>To regularly report on OLA compliance.</p>
PA's Metrics	Percentage of OLAs signed off on time Number of iterations of the OLA before sign off Percentage of OLA Reports delivered on time

Base Practices

BP Number	1.2.1
BP Name	Determine operational items
BP Description	For each service item in the draft SLA, the corresponding operational items that must be supplied to support that service item need be determined.
Example	<i>In many situations, IT service providers are dependent on other groups to support service levels guaranteed to the user community. These areas must be determined, understood, and documented. For example, at times the Service Desk cannot resolve an incident, so the incident must be escalated to a vendor. The Service Desk is dependent on the vendor to resolve the incident, yet it is required to meet the SLA with the users.</i>
BP Number	1.2.2
BP Name	Group related operational items
BP Description	Related operational items should be grouped together. For example, several service items might have workstation operational items. These groupings can be considered as the domains upon which the OLAs are built.
Example	<i>In many situations, service providers depend on other groups for various services. Groups that provide multiple services do not need to have multiple OLAs; rather the relationship can be documented on a single OLA.</i>
BP Number	1.2.3
BP Name	Identify suppliers of operational items
BP Description	Research should be conducted to identify potential suppliers able to fulfil the necessary requirements. Potential suppliers could be external providers, the IT organization, or internal departments within the company.
Example	See BP 1.2.1 Examples of internal suppliers to the Service Desk include Tier 2 and 3 organizations within IT, such as the networking, application development, and change control groups. An example of an external supplier is a hardware or software vendor.
BP Number	1.2.4
BP Name	Finalize service suppliers
BP Description	A final selection of suppliers should be conducted. This selection should be based on finding the supplier that best suits the needs of the organization. Areas that should be examined in selecting service suppliers include cost, training requirements, tools required, physical requirements, installation requirements, and; review and control procedures.
Example	<i>When IT service providers are dependent on external vendors for service, careful consideration should be made to relationship, cost, support, etc.</i>
BP Number	1.2.5
BP Name	Prepare OLAs
BP Description	Once suppliers have been identified, the OLA for each supplier should be prepared. Key Performance Indicators (KPIs) and metrics are defined in order to measure service levels.
Example	<i>In the case of the Service Desk being dependent on a vendor to resolve an escalated incident, an OLA must be drafted to support the SLA the Service Desk has with the user community. If the SLA requires that the incident be resolved in 24 hours, the OLA with the vendor cannot equal or exceed 24 hours.</i>
BP Number	1.2.6
BP Name	Agree to OLAs with suppliers
BP Description	Final approval should be obtained from the parties involved in the OLA agreement process. This will include suppliers, information service personnel, and possibly representatives from the user community. If these parties were involved throughout the development process this should be a straightforward procedure.
Example	<i>Generally, providers internal and external to IT will agree on a trial period (3 to 6 months) to baseline services. When it is determined that the service levels are realistic and attainable, the OLA can be finalized. The finalized OLA supports related SLAs, and penalties and rewards will be awarded accordingly.</i>
BP Number	1.2.7
BP Name	Report on OLA performance
BP Description	Once OLAs are finalized and put into place, reporting on KPIs and metrics is performed to determine whether or not the required service levels are being met.
Example	<i>Reporting on operational levels is performed to ensure that levels are being met. In the case</i>

	<i>of an external vendor, IT will create reports based on data gathered internally when possible. These reports will be cross-referenced with those from the external vendor to ensure accuracy.</i>
--	--

References

	MODE SLA/OLA Management Practice Aid
	MODE IT Operations White Paper
	MODE v2
	MODE v1 Toolkit

Process Area: OLA Management

Level 1

Assessment Indicators: Process Performance

Generic Practice: Ensure that Base practices are performed

5

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
1.2.1 Determine operational items	<i>Operational items corresponding to service level requirements (as defined in SLAs) are mapped.</i>	
1.2.2 Group related operational items	<i>Categories of related operational items have been created. (e.g. by hardware, by type of equipment – laptop, CD ROMs, etc.)</i>	
1.2.3 Identify suppliers of operational items	<i>A list of potential suppliers for each set of operational items exists. Information exists that shows other suppliers were evaluated.</i>	
1.2.4 Finalize service suppliers	<i>Team can explain how service supplier was selected, what criteria was used to finalize decision, etc.</i>	
1.2.5 Prepare OLAs	<i>An OLA between the IT organization and each supplier exists.</i>	
1.2.6 Agree to OLAs with suppliers	<i>Final OLA exists, and is approved.</i>	
1.2.7 Report on OLA performance	<i>Regular reports as specified in the OLA are generated and distributed to appropriate parties.</i>	

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>Policies exist that outline the consequences of deviations from OLA requirements – penalties for under-performance and rewards for exceptional performance.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>Reporting on OLA performance occurs as scheduled and necessary information can be collected. Reports should reflect the process is being completed in a timely manner with appropriate people skills and resources.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>Personnel involved in managing OLAs have experience or training in issues related to service partner management They have received instruction on</i>	

		<i>the OLAs' contents and procedures for addressing violations.</i>	
	GP2.4 Collect data to measure performance	<i>Performance metrics detailed in OLAs are collected.</i>	
	GP2.5 Maintain communication among team members	<i>OLA management ensures that appropriate groups and contacts are kept up to date on OLA decisions.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>OLAs contain provisions for all necessary items such as description of service, KPIs/performance metrics, consequences of OLA violations etc. OLA performance reports are created according to predefined specifications.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>Each OLA is managed independently and adjustments to the OLA documents are made to reflect any changes that occur in agreements with service providers.</i>	

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an IT level	<i>Mechanisms for collecting OLA compliance data are present and utilized. Parties affected by OLAs are aware of procedures and channels for raising OLA violation concerns.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>Plans are created for evaluating new service providers if needed, given projected changes in operations requirements.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>Documented procedures are always followed for escalating or resolving incidents arising from OLA violations.</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>User surveys or evaluations are collected about services performed by external vendors.</i>	

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Targets are regularly set for KPIs and other metrics. Actual measures are compared against these targets.</i>	
	GP4.2 Automate data collection	<i>Service capabilities have been identified in terms of specified KPIs and metrics.</i>	
	GP4.3 Provide adequate	<i>Adequate resources are in place</i>	

	resources and infrastructure for data collection	<i>to analyze and report on OLA performance data.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>Appropriate steps are taken to address discrepancies between actual performance and the targets set.</i>	

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>OLAs are periodically evaluated given the business goals and strategy. If necessary, appropriate modifications are discussed and implemented.</i>	
Process Change	GP 5.1:Deploy “best practices” across the IT organization	<i>The same monitoring, reporting and review procedures are followed for management of each OLA and service partner relationship. When changes, improvements, or tailoring of OLAs are made across the OLA process, this is communicated and implemented throughout the IT organization.</i>	

Process Capability Assessment Instrument: Interview Guide

5.

Process Area	1.2 OLA Management
--------------	--------------------

Questions
Base Practice: 1.2.1 Determine Operational Items
What is the process by which the key operational items required to support the SLAs is determined?
What personnel are assigned responsibility for identifying these key operational items?
Base Practice: 1.2.2 Group Related Operational Items
1. What criteria are used to group operational items together?
Please describe or list the various groupings of operational items.
Does each defined group of operational items typically fall under one OLA?
Base Practice: 1.2.3 Identify Suppliers of Operational Items
What procedure is used to identify potential service providers?
Do service providers include both internal and external organizations?
What information about the service providers is collected?
Are any preliminary negotiations conducted with the suppliers to determine what type of contractual terms they would consider?
Base Practice: 1.2.4 Finalize Service Suppliers
What selection criteria (e.g. cost, training requirements, tools required) are considered when choosing the service providers?
Does a formal system for evaluating potential suppliers exist to aid in the selection process?
Is a list of alternative or back-up suppliers determined?
Base Practice: 1.2.5 Prepare OLAs
How are OLAs prepared and negotiated with suppliers? Is a standardized procedure followed for each OLA?
What do OLAs contain (e.g. workloads, cost of service, targets, type of support etc.)? Does the OLA outline each key business application (e.g. penalties, tools used to maintain the OLA)?
Has a document specifying standard contents of an OLA been created? Are OLAs prepared according to the specifications in this document?

Are Key Performance Indicators (KPIs) or service measurement metrics specified in the OLA?
Are targets for the service measurement metrics specified? If so, how are these targets determined, for example is the supplier capability gauged and considered?
Are OLA monitoring and reporting procedures defined, including the specific reports that will be produced?
Are OLA violation escalation procedures determined?
Is a specification of what constitutes a failed OLA made, and are the penalties (if appropriate) for failure determined?
Are there any provisions for rewards if OLA requirements are exceeded?
Base Practice: 1.2.6 Agree to OLAs with Suppliers
To what parties are OLAs submitted for approval?
How is approval of the OLA documented?
What is the approximate proportion of OLAs created with internal service providers compared to external suppliers?
Where is information about the finalized OLA stored?
What is the process for updating OLAs and who facilitates this process?
Base Practice: 1.2.7 Report on OLA Performance
Are actual statistics required to measure service delivery gathered and in what format are they stored?
Is information on service delivery collected according to prescribed schedules?
Are actual service statistics compared to targets defined in the OLAs?
What types of reports are produced based on the statistics gathered?
Who reviews these reports and what is the process for ascertaining OLA compliance?
If an OLA violation occurs, is the course of action determined at the time of creating the OLA followed?
Is information collected on breached SLAs resulting from an OLA violation?
Generic Questions for Process Area
Do you have personnel who control new and existing OLAs? What relevant qualification or training do they have?
How often are OLAs and service partner relationships reviewed for improvements? What is the process by which this review occurs?
What personnel are assigned responsibility for reviewing OLAs and service partner relationships?
Approximately how many hours are allocated for the review process? Do you think that the resources allocated for this review process are adequate?

Process Capability Assessment Instrument

Process Area	1.2 OLA Management
Process Area Description	<p>OLA Management involves the creation, management, reporting, and discussion of Operations Level Agreements with suppliers and vendors. OLAs enable the IT organization to provide the level of service stipulated in a Service Level Agreement as supporting services are guaranteed in the OLA. An OLA is an agreement between the IT organization and those delivering the constituent services of the system. Operational Level Management involves the following:</p> <p><i>OLA Definition:</i> An OLA outlines the type of service that will be delivered to the users from each service provider. OLA Definition works with service providers to define:</p> <ul style="list-style-type: none"> Whether a particular service level can be met, and how it will be met through operational levels Which provider(s) can supply a service, or part of a service Roles and responsibilities What constitutes a failure to meet the OLA, and corresponding penalties (if appropriate) Procedures for monitoring operational levels Cost structures How the service will be measured Contractual arrangements with the providers <p>Formal OLAs are defined for suppliers who are external to the IT organization. They may take the form of maintenance contracts, warranties, or service contracts. Further formal or informal OLAs may also be created for internal suppliers, depending on the size of the organization.</p>

	<p><i>OLA Reporting:</i> The actual production of trend reports are necessary to monitor and meter the effectiveness of an OLA.</p> <p><i>OLA Control:</i> It is important that the services described in OLAs are carefully aligned with current business needs, monitored to ensure that they are performed as described, and updated in line with changes to business needs.</p> <p><i>OLA Review:</i> The reports generated from tracking OLAs are reviewed to ensure that the OLAs are carefully aligned with current business needs and if necessary updated to be in line with business needs. In enterprise environments, this process becomes more complex as more components are required to perform these services.</p>
--	--

Questionnaire

Process Area	1.2 OLA Management (Service Partner Management)
--------------	---

5

		Yes	No	Don't Know	N/A
1	Do you have Operations Level Agreement (OLA) which define the levels of support between the providers of services and the users?				
2	Are the operational items needed to support the SLA determined and documented?				
3	Are related operational items identified and grouped together into a domain upon which a single OLA can be built?				
4	Is research conducted to identify potential service providers that could meet the operational requirements?				
5	Is analysis undertaken to select service providers from the pool of candidates?				
6	For each service provider, is an OLA prepared and are measures for assessing service levels specified?				
7	Is approval of the OLA obtained from all parties involved in the OLA agreement process?				
8	Are service levels measured and reported periodically to monitor OLA compliance?				
9	Are penalties and rewards identified in the OLA?				

Work Product list

Process Area	1.2 OLA Management (Service Partner Management)
--------------	---

10

- Sample OLA document
- Service level performance reports
- OLA compliance reports
- Vendor/supplier selection information
- Responsibility matrix
- OLA Communication flow
- Job Description of OLA manager and staff

15

20

Service Desk (1.3)

PA Number	1.3
PA Name	Service Desk
PA Purpose	<p>The Service Desk provides a single point of contact for users with problems or specific service request. The Service Desk forms part of an organization's strategy to enable users and business communities to achieve business objectives through the use of technology.</p> <p>The Service Desk main objectives are:</p>

	<p>To help users when required. To manage problem resolution. To log and document problems types, their frequency, and associated workarounds. To produce management reports on levels of service and user satisfaction.</p> <p>The Service Desk consists of the following functions:</p> <p><i>Incident Management</i> – An incident is a single occurrence of an issue that affects the delivery of normal or expected services. Incident Management strives to resolve as high a proportion of incidents as possible prior to passing them on to other areas.</p> <p><i>Problem Management</i> – A problem is the underlying cause of one or more incidents. Problem Management utilizes the skills of experts and support groups to fix and prevent recurring incidents by determining and fixing the underlying problems causing the incidents.</p> <p><i>Request Management</i> – Request Management is responsible for coordinating and controlling all activities necessary to fulfill a request from a user, vendor, or developer. Requests can be raised as change requests with Change Control, or planned, executed, and tracked by the Service Desk. Request Management is responsible for coordinating and controlling all activities necessary to fulfill a request from a user, vendor, or developer. Further sub-functions of Request Management are:</p> <p><i>Request Logging</i> <i>Impact Analysis</i> <i>Authorization</i> <i>Prioritization</i></p>
--	--

PA's Base Practices	1.3.1 Call attention 1.3.2 Incident/request logging 1.3.3 Incident/request qualification 1.3.4 Incident/request assignment 1.3.5 Incident & problem resolution 1.3.6 SLA & OLA tracking and monitoring 1.3.7 Resolution confirmation 1.3.8 Incident/request closure 1.3.9 Trends and repetitive incidents analysis 1.3.10 Service level control 1.3.11 Receive requests
PA Goals	To continuously improve IT service delivery to users. To progress from reactive to proactive user support. To provide a solution to meet technical and business problems. To out perform and exceed user expectations.
PA's Metrics	Average Response Time for Incidents/Problems Support Desk Cost Per User Average Resolution Time Percentage of Calls Escalated Percentage of Calls Answered

Base Practices

BP Number	1.3.1
BP Name	Call attention
BP Description	To ensure full coverage of all possible user timetables, various methods of communication with the Service Desk should be made available.
Example	<i>The Service Desk can receive incidents, problems, and requests via phone, fax, e-mail, internet, and automation through application tools.</i>
BP Number	1.3.2
BP Name	Incident/request logging
BP Description	Service Desk operators manually log incidents due to calls received. Incidents may also be generated automatically by various systems management tools. Incident Logging consists of a categorization of the call and its prioritization using a prioritization scheme. The Service Desk performs this process on-line with the user.

Example	<i>Service Desk analysts log incidents and requests into a problem management system, such as Remedy ARS, Expert Advisor, or a Lotus Notes database. Information such as name, phone, location, asset details, nature of problem, severity, etc., should be included in the trouble ticket or request.</i>
BP Number	1.3.3
BP Name	Incident/request qualification
BP Description	As soon as an incident is received from a user, an attempt is made to resolve it immediately. A case-based reasoning tool that searches a knowledge database can assist with possible solutions.
Example	<i>A resolution to an incident or problem by the Service Desk analyst can be made using various methods. These can vary by previous experience, a known solution for a short-term problem (for example, a printer isn't working, so the user is redirected to a working printer), reviewing vendor documentation, or by using knowledge base programs integrated with the problem management tool.</i>
BP Number	1.3.4
BP Name	Incident/request assignment
BP Description	This step is performed when first level of the Service Desk cannot solve the incident, problem, or request.
Example	<i>After providing the user with the incident ID, a resource is assigned to take ownership of the trouble ticket. The first assignment should be a first level support staff when possible. A second level assignment should be performed only for complex incidents requiring a specific expertise. This support person may or may not be part of the Service Desk. The new assignee is then notified of the status of the incident/request.</i>
BP Number	1.3.5
BP Name	Incident & problem resolution
BP Description	If a solution is not found within the time specified in the SLA the problem is escalated. Escalation (manual or automated) is subject to the Tracking and Monitoring process step.
Example	<i>Reassignments can occur during a problem resolution when it has not been fixed within the SLA target hours or when a more appropriate resource could resolve the problem. The appropriate IT resource must be notified if no solution can be found after the incident has been escalated to the highest priority.</i>
BP Number	1.3.6
BP Name	SLA & OLA tracking and monitoring
BP Description	The Service Desk is responsible for tracking the problem resolution process to ensure they are meeting the required level of service.
Example	<i>Service Desk operators or experts should monitor and detect: Incidents not associated with a problem Excessive reassignments Deviations in the times estimated to carry out tasks Problem types and frequency</i>
BP Number	1.3.7
BP Name	Resolution confirmation
BP Description	Before a problem can be marked as 'closed', affected users must be consulted. If resolution is not confirmed and the call has been escalated to the highest priority, the appropriate IT resource is notified and will deal with the user directly.
Example	<i>When the Service Desk resolves a problem, the user must be contacted to ensure that the incident or request was resolved to their satisfaction. Once the user has agreed that the matter is resolved, the Service Desk analyst will mark the incident closed.</i>
PB Number	1.3.8
PB Name	Incident/request closure
PB Description	When the incident is closed, the solution must be reported in the solution database if it is associated to a problem.
Example	<i>In order to resolve future problems, solutions to problems need to be entered into the problem management system. In the future, Service Desk analysts can then query the database for solutions to incidents that are received.</i>
BP Number	1.3.9
BP Name	Trends and repetitive incidents analysis
BP Description	Repetitive incidents and chronic resources are identified so that a proactive response can be provided and service levels can be improved.

Example	<i>One on-going task of second level support staff should be to collect historical data about recurring incidents that could be associated with underlying problems. Using monitoring tools and incidents logged by users, analysis should be conducted to proactively identify issues that cause problems and recurring incidents.</i>
BP Number	1.3.10
BP Name	Service level control
BP Description	Monitoring and control processes are used to ensure that the quality of problem management service offered to users is satisfactory and in accordance with agreed SLAs.
Example	<i>The Service Desk will generate internal reports on its ability to meet service levels. Examples of reports include: number of incidents resolved at the initial call; number of calls escalated to Tier 2; and resolution time by severity.</i>
BP Number	1.3.11
BP Name	Receive requests
BP Description	If a user request results in the necessity for a change to be made, the request will affect the Change Control function, which may be outside of the Service Desk. Some requests, however, do not require a real change as they are related to equipment upgrades, new equipment requests, new user profiles, information on the system, 'how-to' questions, and so on.
Example	<i>The Service Desk will receive requests of all types, including requests for new users, moves, and updates to software or hardware. All requests are logged and tracked in the same manner as incidents and problems.</i>

References

	MODE Best Practices in Service Desk Practice Aid - Volume I
	MODE v2
	MODE v1 Toolkit

Process Area: Service Desk

Level 1

Assessment Indicators: Process Performance

Generic Practice: Ensure that Base practices are performed

5

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
1.3.1 Call attention	<i>Service Desk has a direct number for users to call. Users are able to send requests or report problems via an email address set up for the Service Desk. Users aware of all options available to them to contact the Service Center.</i>	
1.3.2 Incident/request logging	<i>The Service Desk has an automated problem management system.</i>	
1.3.3 Incident/request qualification	<i>A categorization or prioritization scheme in place.</i>	
1.3.4 Incident/request assignment	<i>A process is in place for re-assignment of incidents & requests for instances when the Service Desk can't resolve the problem. The problem management system is set up to handle re-assignment.</i>	
1.3.5 Incident & problem resolution	<i>An escalation process is defined and in place. Support staff are able to describe the process.</i>	
1.3.6 SLA & OLA tracking and monitoring	<i>SLA/OLA Reports exist. The staff knows and understands the service levels required of them.</i>	
1.3.7 Resolution confirmation	<i>Call backs to the user are performed and tracked.</i>	
1.3.8 Incident/request closure	<i>A solution database for problems exists and is used by the Service Desk staff.</i>	
1.3.9 Trends and	<i>Are there any trending reports? Does staff tie back incidents to problems?</i>	

repetitive incidents analysis		
1.3.10 Service level control	<i>Service level reports exist. Staff is aware of how well they are performing in regards to service levels.</i>	
1.3.11 Receive requests	<i>If the Service Desk responsible for handling requests, a different schema / screen exists in the problem management system for requests.</i>	

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>Policy for hours of operation exists and is followed. Standard applications are supported, and Service Desk staff know what is supported.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>All Service Center personnel have access to the problem management software when they need it (vs. the Service Desk having an insufficient number of floating licenses) The staff has the required access and permissions to perform their jobs. Supervisor of the Service Desk uses a staffing plan, and has an acceptable ratio of support personnel to users.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>Training policy in place for new staff members. The organization provides training on all technologies supported.</i>	
	GP2.4 Collect data to measure performance	<i>Metrics are collected, for example: resolution time, response rate, etc.</i>	
	GP2.5 Maintain communication among team members	<i>Issues are tracked and logged. The team provides status reports</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>All fields in a trouble ticket completed, rather than staff members typically leaving some fields blank.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>Different databases exist for different environments. For example, a database for incidents and problems in the test environment; one for the development environment, etc.</i>	

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an IT level	<i>Requests are always handled according to the stated policy (vs. people frequently circumvent the process)</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>The Service Desk distributes surveys to determine how their users view their services. The Service Desk manager solicits feedback from the team, and from Tier 2 and Tier 3 support staff.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>There is one centralized Service Desk for the entire organization,(vs. each department has their own) The Service Desk support a standard list of hardware and software, and all end users are informed of them.</i>	
	GP3.4 Provide feedback in order to maintain	<i>New employees receive training on the Service Desk process (problem and request</i>	

	knowledge and experience	<i>management) Tier 2 and 3 support staff are trained on the Help Desk tools and process</i>	
--	--------------------------	--	--

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Service levels are based on strategic business needs vs. industry standards.</i>	
	GP4.2 Automate data collection	<i>Metrics are automatically collected from the problem management tool (vs. collected manually)</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>Ties to systems management are in place. Tickets are automatically created when systems management tools detect faults. Adequate resources are in place to analyze and report on Service Desk data.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>Service levels are revised after reviewing actual data on Service Center performance (response rates, resolution rates, etc.)</i>	

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>The Service Center practices "call avoidance" to some extent (problems being automatically fixed by tools, or fixed prior to users calling them in?) New technologies are looked into for use on the Service Desk. Surveys results are used to understand the users' perception of the Service Desk, and results are used to improve service. Service Desk staff are active in Help Desk organizations, such as HDL.</i>	
Process Change	GP 5.1: Deploy "best practices" across the IT organization	<i>Users have access to knowledge base tools on the LAN / intranet that allow them to try to resolve things on their own.</i>	

5

Process Capability Assessment Instrument: Interview Guide

Process Area	1.3 Service Desk
--------------	------------------

Questions
Base Practice: 1.3.1 Call Attention
What methods are available to users for communication with the Service Desk, and do users have access to resources needed for such communication?
Are all users informed how and when to contact the Service Desk? If so, how?
Do all users receive the same level of support? If no, how does support differ?
Do you gather call statistics like total volume of calls and number of abandoned calls? If so, can we access this information?
Is there a need for after-hours support? If so, what type of after-hours support does the Service Desk provide?
Base Practice: 1.3.2 Incident/Request Logging
1. What is the procedure for logging incidents/requests, and is this followed in all cases?
Is a priority level assigned to the incident/request at time of receipt and how is it determined?

Base Practice: 1.3.3 Incident/Request Qualification
Do Service Desk personnel have access to a catalogue/database of frequently occurring incidents and their solutions, and does its format allow for rapid access and search?
How often is this catalogue/database accessed to provide an immediate solution or work-around to the user? (e.g., all calls, some calls, very few calls)
How frequently is this catalogue/database updated?
What other resources exist to aid Service Desk personnel with immediate incident resolution?
Base Practice: 1.3.4 Incident/Request Assignment
Is there a defined time frame within which the incident/request should be assigned and is it usually followed?
Are users notified of receipt, status and approximate time to resolution (if possible) of incident/request and provided with the incident/request ID?
By what process is the appropriate personnel determined for handling an incident/request?
Is a defined system used for assigning responsibility for an incident/request to the appropriate personnel? (e.g. trouble tickets are generated and sent to appropriate personnel)
Is a record made of the person to whom the incident/request is assigned?
Base Practice: 1.3.5 Incident & Problem Resolution
Are non-resolved incidents/problems escalated according to procedures defined in SLAs?
2. How are appropriate resources notified that the incident/problem has been escalated?
While problem resolution is in process, is a work-around solution determined and conveyed to the user?
When a problem is escalated or a resolution has been determined, is the log updated?
Does the Service Desk or the party to whom the problem was escalated "own" the problem?
Base Practice: 1.3.6 SLA & OLA Tracking and Monitoring
What is the system for tracking and monitoring the problem resolution process for an incident/request?
What types of issues (e.g. excessive reassignments, deviations from estimated task times) are flagged and what action is taken to address them?
Base Practice: 1.3.7 Resolution Confirmation
Are users notified of incident/request resolution?
Is confirmation sought from the user to verify that incident/request has been resolved satisfactorily?
If such confirmation is not obtained what is done?
Base Practice: 1.3.8 Incident / Request Closure
How is an incident/request closed? What records are made?
If it exists, is a solution database updated with the incident/problem and solution for future reference?
What parties are informed of a closure?
Base Practice: 1.3.9 Trends and Repetitive Incident Analysis
Are incidents analyzed to detect trends and identify underlying problems? If so, by what process?
Are users notified of known incidents proactively before they report the incident?
Base Practice: 1.3.10 Service Level Control
Does the Service Desk generate reports comparing actual service levels (eg. Number of incidents resolved at initial call, resolution time by severity) with target service levels?
Who receives these reports and for what purposes?
How are service levels targets set and what is the process for reviewing/updating them?
Do the users communicate their views of support to the Service Desk and agree with the Service Desk's assessment of incident and problem management?
Base Practice: 1.3.11 Receive Requests
Are requests handled immediately or do they require provisioning/approval?
Does the Service Desk coordinate the approval of requests with the appropriate functions and notify requester of approval/rejection?
If request requires functions outside the Service Desk, how does the Service Desk pass responsibility to the appropriate personnel?
Do SLAs exist between the Service Desk and the end user community?
Do agreements exist between the Service Desk and the next level of support (internal or external)?
Generic Questions for Process Area
Are the policies for Service Desk operation outlined in a document? How are employees made aware of these policies?

What mechanisms are in place to ensure policies are followed?
How frequently are Service Desk policies reviewed and/or modified? What is the process for such policy updates?
Are the current staff and resources of the Service Desk adequate for satisfactorily meeting user needs.
What type of qualification and/or training do Service Desk personnel have?
Are Service Desk operations periodically reviewed in order to identify and implement potential improvements? Who manages this process?
Are any metrics computed to assess the Service Desk performance? If so, please describe them. Are targets for these metrics established and performance assessed against them?

Process Capability Assessment Instrument

Process Area	1.3 Service Desk
Process Area Description	<p>The Service Desk provides a single point of contact for users with problems or specific service request. The Service Desk forms part of an organization’s strategy to enable users and business communities to achieve business objectives through the use of technology.</p> <p>The Service Desk main objectives are: To help users when required. To manage problem resolution. To log and document problems types, their frequency, and associated workarounds. To produce management reports on levels of service and user satisfaction.</p> <p>The Service Desk consists of the following functions:</p> <p><i>Incident Management</i> – An incident is a single occurrence of an issue that affects the delivery of normal or expected services. Incident Management strives to resolve as high a proportion of incidents as possible prior to passing them on to other areas.</p> <p><i>Problem Management</i> – A problem is the underlying cause of one or more incidents. Problem Management utilizes the skills of experts and support groups to fix and prevent recurring incidents by determining and fixing the underlying problems causing the incidents.</p> <p><i>Request Management</i> – Request Management is responsible for coordinating and controlling all activities necessary to fulfill a request from a user, vendor, or developer. Requests can be raised as change requests with Change Control, or planned, executed, and tracked by the Service Desk. Request Management is responsible for coordinating and controlling all activities necessary to fulfill a request from a user, vendor, or developer. Further sub-functions of Request Management are: <i>Request Logging</i> <i>Impact Analysis</i> <i>Authorization</i> <i>Prioritization</i></p>

5

Questionnaire

Process Area	1.3 Service Desk
--------------	------------------

		Yes	No	Don't Know	N/A
1	Do you have a centralized Service Desk or client interface for reporting incidents and tracking them?				
2	Is there a single point of contact for all Service Desk requests?				
3	Are a variety of methods (e.g. Phone, Fax, Email, Web-site) available to users for communication with the Service Desk?				
4	Does a system exist for logging and assigning a priority level to incidents/requests at the time of receipt?				

5	Do Service Desk personnel attempt to provide a work-around or known solution to user at the time an incident is reported?				
6	Is a procedure for assigning incidents/requests to the appropriate personnel followed?				
7	Are non-resolved problems escalated according to procedures defined in SLAs?				
8	Does the Service Desk monitor the incident/request resolution process to ensure service requirements are being met?				
9	Is the user contacted to confirm satisfactory resolution, before an incident is closed?				
10	Is a solutions database or file maintained to serve as a reference resource in the future?				
11	Are incidents and incident trends analyzed to detect underlying problems?				
12	Does the Service Desk have a system for evaluating its overall performance?				
13	If a request requires a function outside of the Service Desk, does the Service Desk coordinate and monitor the processing of the request?				
14	Does the Service Desk provide support (e.g. beeper, pager?) for emergency incidents?				

Work Product list

Process Area	1.3 Service Desk
--------------	------------------

5
10

- Trouble ticket
- Employee training handbook
- User surveys
- Performance reports (resolution, response, trending, etc.)
- SLA
- Sample log record for an incident/request
- Staffing plan document

Service Pricing (1.4)

PA Number	1.4
PA Name	Service Pricing
PA Purpose	<p>Service Pricing is comprised of the following areas:</p> <p>Service Pricing & Cost: Service Costing & Pricing projects and monitors costs for the management of operations, provision of service, equipment installation, etc. Based upon the projected cost and business needs, a service pricing strategy may be developed to re-allocate costs within the organization. If developed, the service pricing strategy will be documented, communicated to the users, monitored and adjusted to ensure that it is both comprehensive and fair.</p> <p>Billing & Accounting: The purpose of Billing & Accounting is to gather information for calculating actual cost, determine chargeback costs and bill users for services rendered.</p>
PA's Base Practices	<p>Service Pricing & Cost:</p> <ul style="list-style-type: none"> Determine projected service/equipment costs and depreciation schedule for distributed technical environment Determine if chargeback is appropriate Determine usage trends Prepare budgets and ensure that data is valid and correct Identify product/service options associated with service level objectives Define products/services in terms useful to customers Determine service price costs and Model/evaluate costs Determine cost allocation plans for services and equipment Prepare, distribute, and maintain a catalogue of service prices for users Inform users about costs Monitor and assess budgetary spending and actual costs vs projected costs Review current and planned budgets and cost allocation plans with management/user

	<p>Define what the reporting specifications are and report on financial information Disseminate reports to appropriate parties Billing & Accounting: Chargeback Administration Reporting and Trending of Chargeback results</p>
PA Goals	<p>Service Pricing & Cost: Billing & Accounting: To maintain accounting information on service and resource usage. To maintain fixed cost information for assets and calculate depreciation. To calculate combined costs for equipment and services. To notify management of any deviations to proposed spending. To reconcile service provider costs against monitored costs and OLA violations. To calculate any rebates due to SLA violations. To produce reports for billing purposes.</p>
PA's Metrics	<p>Service Pricing & Cost: Billing & Accounting: Percentage of chargebacks outstanding per month Percentage of chargebacks paid on time each month Total cost of software per month Total cost of hardware per month Total cost of services/support per month Total amount of money spent per month by department</p>

Base Practices

Service Pricing & Cost	
BP Number	1.4.1
BP Name	Determine projected service/equipment costs and depreciation schedule for distributed technical environment
BP Description	Work with vendors, asset management, SLAs, and OLAs to get a list of all equipment, software, and support costs with projected depreciation for the next year to determine the value of purchasing verses leasing. If possible, throughout the year touch base or receive updates to depreciation costs from vendors, asset management, etc.
Example	<i>If a project's life span is only a few months and requires special equipment it may be cheaper to lease equipment at a higher payment a month then to outright purchase the equipment incurring lower monthly payments due to the depreciation cost of the equipment.</i>
BP Number	1.4.2
BP Name	Determine if chargeback is appropriate
BP Description	Items that are part of a company's overhead that do not need to be charged back to the department, project, or individual should be outlined in a service document, possibly an SLA.
Example	<i>In a work environment some items such as general supplies (pens, pencils, paper, etc.) may be included in the company's overhead and does not require a chargeback to the project or department.</i>
BP Number	1.4.3
BP Name	Determine usage trends
BP Description	Collect data on what services are being used, how often, and when. This data can be used to provide load-balancing information for people needed to support the services.
Example	<i>If support attention reaches a peak on Friday afternoon 2:00pm it may be worthwhile to increase the number of service desk representatives answering phones at this time.</i>
BP Number	1.4.4
BP Name	Prepare budgets and ensure that data is valid and correct
BP Description	Budgets prepared by each project or department should be as accurate as possible. Data should be collected and cross referenced with current service/product cost, expected growth, and past budgetary needs. Periodic audits of the budget will help keep the data valid and up to date.
Example	<i>It may be essential to look at past budgets, the growth of the group, service/product cost for the current year, and include a contingency for extra growth or any other unexpected service/product needs.</i>
BP Number	1.4.5

BP Name	Identify product/service options associated with service level objectives
BP Description	Cross reference and document product/service offered with SLA.
Example	<i>All standard product/service options are documented or outlined in the company's SLA</i>
BP Number	1.4.6
BP Name	Define products/services in terms useful to customers
BP Description	Outline in detail in SLAs and OLAs documents the products and services that are available and any outside cost that maybe incurred if the customer needs to go outside the standard products and services.
Example	<i>In a company there may be a standard seat charge to cover standard services such as PC support, phone support, company e-mail service, mail delivery, etc. If a project needs a special application it may be necessary for the project to cover the extra cost of hardware, software, and extra support needed for the special application.</i>
BP Number	1.4.7
BP Name	Determine service price costs and Model/evaluate costs
BP Description	A cost model is created based off of the business and pricing strategy.
Example	<i>The cost model may take the form of a chargeback structure, a budget structure, or a cost structure for each department or group.</i>
BP Number	1.4.8
BP Name	Determine cost allocation plans for services and equipment
BP Description	Cost allocation plan must delineate between common infrastructure components and department/user specific components.
Example	<i>Cost allocation plan and billing will be reflected with specific purchases of equipment and services for a given department and will have an associate "over-all" or "seat-charge" for infrastructure components (e.g. printers, shared e-mail servers, backup/restore equipment, etc.)</i>
BP Number	1.4.9
BP Name	Prepare, distribute, and maintain a catalogue of service prices for users

BP Description	Ensure that a list of services and their cost is made available. This list should be a living document that is updated frequently. This document should be broken down to the lowest level of each service if possible.
Example	<i>A vendor may be asked to submit separate pricing for each of the service areas and service levels outlined in their "scope of service" agreement or contract.</i>
BP Number	1.4.10
BP Name	Inform users about costs
BP Description	Justify the charges assigned to the customer for a particular service. Provide a breakdown of charges.
Example	<i>Cost of services does not only mean individual services per person or department. Cost also needs to be factored in for shared resources.</i>
BP Number	1.4.11
BP Name	Monitor and assess budgetary spending and actual costs vs projected costs
BP Description	By reviewing reports and trending data, department/project/user budget auditing, monitoring, and assessing is possible.
Example	<i>Cross-referencing the reports with an updated catalog of service pricing it may be possible to identify cost reduction opportunities.</i>
BP Number	1.4.12
BP Name	Review current and planned budgets and cost allocation plans with management/user
BP Description	Establish checkpoints when creating budgets to verify the cost allocation and budgeting strategy with management.
Example	<i>Review and have sign-off by management on the budget plans.</i>
BP Number	1.4.13
BP Name	Define what the reporting specifications are and report on financial information
BP Description	The purpose of this activity is to collect consistent, detailed financial information regarding service costs for each department or project in a company. A specification to this collection needs to be set so that unnecessary information is not collected.
Example	<i>Financial thresholds need to be set along with what specific data and how often it should be reported on. A company may have the following reports: Cost of hardware support internal per department per month.</i>

	<i>Cost of hardware support by external vendor per department per month Cost of software support per department per month Cost of software support by external vendor per department per month Report of how on or off budget a department may be.</i>
BP Number	1.4.14
BP Name	Disseminate reports to appropriate parties
BP Description	Assure that monthly reports are distributed to departments or project groups to verify any chargebacks and so they can use as a checkpoint to verify that they are on track with their budgets.
Example	<i>Monthly equipment support reports can be used to determine and plan for equipment upgrades and training for users to better understand their equipment.</i>
Billing & Accounting	
BP Number	1.4.15
BP Name	Chargeback Administration
BP Description	This purpose of this activity is to collect statistics on systems usage by users, groups, or departments and then allocates charges based on an appropriate chargeback algorithm. Allocation of charges is intended to communicate to the users how much processing services that they are using actually costs. Chargeback Administration also monitors the actual payments for services rendered, and credits for SLA and OLA violations by the service provider.
Example	<i>An account table is set up to describe the various users and departments and how system data that is collected is to be allocated across these entities. This table will periodically change as new users are added, departments change, and charging algorithms and elements change. Periodic maintenance will need to be done on this table to ensure that charges are being allocated correctly based on the most current requirements of the business.</i>
BP Number	1.4.16
BP Name	Reporting and Trending of Chargeback results
BP Description	This activity is intended to report and trend chargeback results to document and track chargeback activities and goods/services purchased.
Example	<i>Chargeback bills and reports will be produced on a periodic (probably monthly) basis. These will be sent to users to provide an audit for billed charges.</i>

References

	MODE v2
	MODE v1 Toolkit
	Request for Proposal IT Outsource Project Paper (rfp_fi~1.doc)
	Chargeback Implementation White Papers

Process Area: Service Pricing

Level 1

Assessment Indicators: Process Performance

Generic Practice: Ensure that Base practices are performed

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
1.4.1 Determine projected service/equipment costs and depreciation schedule for distributed technical environment	<i>An annual projection of all equipment/service costs is made and depreciation schedules exist for appropriate equipment.</i>	
1.4.2 Determine if chargeback is appropriate	<i>All items with associated chargebacks are specified.</i>	
1.4.3 Determine usage trends	<i>Data collected and available on what services are used, frequency of use and time of use.</i>	
1.4.4 Prepare budgets and ensure that data is valid and correct	<i>Operating budgets are prepared for each department by a method that ensures accurate forecasting.</i>	
1.4.5 Identify product/service	<i>Example of SLA that outlines the product/services that</i>	

options associated with service level objectives	<i>will be provided.</i>	
1.4.6 Define products/services in terms useful to customers	<i>Example of notification sent to customers of products/services offered.</i>	
1.4.7 Determine service price costs and model/evaluate costs	<i>Cost model or cost recovery approach is available.</i>	
1.4.8 Determine cost allocation plans for services and equipment	<i>Cost allocation plans exist that specify how shared and user/department specific costs are to be allocated.</i>	
1.4.9 Prepare, distribute, and maintain a catalogue of service prices for users	<i>A list of available services and service costs.</i>	
1.4.10 Inform users about costs	<i>Example of the information sent to users on the breakdown (shared vs. individual) of costs allocated to them.</i>	
1.4.11 Monitor and assess budgetary spending and actual costs vs projected costs	<i>When questioned, the process for monitoring and assessing budgetary spending can be explained.</i>	
1.4.12 Review current and planned budgets and cost allocation plans with management/user	<i>Example of budgets and cost allocation plans that are submitted to management and user representatives for review/approval.</i>	
1.4.13 Define what the reporting specifications are and report on financial information	<i>When questioned, the policies on financial information to be reported can be described.</i>	
1.4.14 Disseminate reports to appropriate parties	<i>Example of chargeback reports sent to management/departments/projects</i>	
1.4.15 Chargeback administration	<i>When questioned, chargeback administration can be explained in detail.</i>	
1.5.16 Reporting and trending of chargeback results	<i>Regular reports on chargeback results are produced.</i>	

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>Documented policies or a chargeback algorithm describe the how service costs will be allocated.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>A tool/mechanism is in place for collecting all necessary financial, service usage and product/service data for computing chargebacks.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>New staff involved with service pricing receive training on the process and relevant policies.</i>	
	GP2.4 Collect data to measure performance	<i>Data are collected, for example: percentage of chargebacks outstanding per month, total amount of money spent per department per month.</i>	
	GP2.5 Maintain communication among team members	<i>Departments/users receive monthly reports on charges allocated to them. Issues are tracked and reported.</i>	

Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>All service pricing or chargeback reports are produced according to documented specifications.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>The cost model and chargeback structures are placed under version control so the most current copy is reviewed on a scheduled and documented basis.</i>	

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an IT level	<i>Costs are allocated according to defined chargeback structure.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>A process is in place for departments/users to provide feedback on the appropriateness of the chargeback structure.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>The cost plan/model covers each department and aggregates upwards, so that a full organization view of costs is possible.</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>Service pricing personnel receive notification or training if necessary as changes are made to the service costing model or process.</i>	

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Targets are established for metrics aimed at capturing the effectiveness and level of operational success of the service pricing process.</i>	
	GP4.2 Automate data collection	<i>A tool for automatically collected required usage statistics and assessment metrics is used.</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>Sufficient resources are allocated to service pricing so that all specified data requirements can be met.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>Targets are compared to actual performance and discrepancies evaluated.</i>	

5

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>Service pricing strategy and cost models are periodically</i>	

		<i>evaluated to identify changes that would enable honing in on the true cost amount generated by individual departments/projects/users.</i>	
Process Change	GP 5.2:Deploy “best practices” across the IT organization	<i>Any changes to the cost allocation algorithms or chargeback administration are applied to all relevant areas of the organization.</i>	

Process Capability Assessment Instrument: Interview Guide

Process Area	1.4 Service Pricing
--------------	---------------------

5

Questions
Base Practice: 1.4.1 Determine projected service/equipment costs and depreciation schedule for distributed technical environment
What is the process for projecting costs of service and equipment capacity enhancements? How frequently does this occur?
Can costs be projected on a customer-group basis?
Can service costs be broken down by implementation, operation and overhead for each service?
How are depreciation schedules determined?
Are projected costs and depreciation figures used to decide between leasing and purchasing?
Currently, what is the approximate percentage of leased and purchased equipment?
Base Practice: 1.4.2 Determine if chargeback is appropriate
What criteria are used to determine which items will be charged back?
Are departments or other appropriate parties informed of the items with associated charges?
Are there any known “hidden costs” (e.g. users spending business time helping other users)?
What types of costs are not charged to department/project/individuals?
Base Practice: 1.4.3 Determine usage trends
What information is collected on service/equipment usage? Where is this information stored?
What type of trending analysis is performed using this data (e.g. frequency of calls to Service Desk per department)
For what purposes are trend data used?
Base Practice: 1.4.4 Prepare budgets and ensure that data is valid and correct
What is the process for creating budgets? Does each department follow a standard procedure?
What information is analyzed while preparing budgets? Are projected service/product costs, expected growth and past budgetary needs considered?
Are periodic audits of the budget performed to ensure the use of accurate and valid data?
Do budgets include contingencies for unanticipated growth or product/service needs?
Base Practice: 1.4.5 Identify product/service options associated with service level objectives
Are SLAs or service level objectives reviewed to verify that all needed products/services are being offered?
At present, are all products/services covered by SLAs?
If a cost cannot be tied back to an SLA, does an evaluation of the need or justification for that service/product occur?
Who is responsible for the process of checking product/service options against SLAs?
Base Practice: 1.4.6 Define products/services in terms useful to customers
How are appropriate parties informed of services/products offered?
Is information sent of additional costs for non-standard products/services?
Base Practice: 1.4.7 Determine service price costs and model/evaluate costs
How are service costs finalized? Who is in charge of this process?
What type of cost modeling is done? Why was this strategy settled on?
Has a pricing strategy been defined? If yes, please describe.
Does the pricing strategy map back to the services being provided?
Base Practice: 1.4.8 Determine cost allocation plans for services and equipment
What is the procedure for creating cost allocation plans for services and equipment?

How are costs of shared resources (e.g. service desk, technical infrastructure) allocated?
Base Practice: 1.4.9 Prepare, distribute, and maintain a catalogue of service prices for users
What information does the catalogue of service prices for users contain?
How is the catalogue distributed, and how frequently?
Who receives the catalogue and for what purposes?
How frequently is the catalogue updated?
Base Practice: 1.4.10 Inform users about costs
How are users informed of the breakdown of costs (both individual and shared) allocated to them?
Have you found that informing users about costs affects their service expectations and/or the efficiency with which resources are used/requested?
Base Practice: 1.4.11 Monitor and assess budgetary spending and actual costs vs projected costs
1. What is the procedure for monitoring budgetary spending?
What are the outputs of the budgetary spending assessment process? (i.e. what documents are produced?)
What occurs when spending deviates from budget?
What is the process for notifying management of deviations from proposed spending?
Base Practice: 1.4.12 Review current and planned budgets and cost allocation plans with management/user
Are budgets and allocation plans submitted to management and user representatives for review?
Does management or customer sponsor sign off plans?
What is the procedure for modification of the budgets or plans if initial approval is not obtained?
Is the cost allocation plan reviewed to ensure that costs are accurately captured and prices are fair? How does this occur?
Base Practice: 1.4.13 Define what the reporting specifications are and report on financial information
Have the expenses reporting specifications been made?
Are financial reports produced according to these specifications?
What are the cost reports that are regularly generated? How frequently are these reports produced?
Base Practice: 1.4.14 Disseminate reports to appropriate parties
1. Who receives the regular financial reports on service costs and for what purposes?
2. Do departments use these reports to monitor their spending vis-a-vis their budgets?
Base Practice: 1.4.15 Chargeback administration
What are the entities for which statistics on service/resource usage are gathered?
What type of algorithm or system is used for allocating costs using the usage statistics? How are fixed costs allocated?
Is the data entry and allocation system periodically checked to ensure accurate and appropriate chargebacks?
Are combined costs for equipment and services calculated and allocated?
Are service provider costs reconciled against monitored costs and OLA violations?
Are rebates calculated due to any SLA violations?
Base Practice: 1.4.16 Reporting and trending of chargeback results
What type of trend analysis is performed on chargeback data? What information is sought?
2. Who reviews chargeback trends and what type of action might such reviews result in?
Generic Questions for Process Area
Who oversees and is involved in the Service Costing and Pricing process? What are their responsibilities? What training do they receive?
Are all service costing and pricing procedures documented? Do personnel involved with service pricing view these documents?
Are these procedures reviewed for the purpose of identifying potential improvements? How frequently does this occur?
Are any targets or goals set for performance of service pricing operations?
Are any metrics collected to assess performance or goal achievement with regard to service pricing? If so, what are they?
Do you feel that the resources allocated for Service Costing and Pricing purposes are adequate? Please elaborate.

Process Capability Assessment Instrument

Process Area	1.4 Service Pricing
Process Area	Service Pricing is comprised of the following areas:

Description	<p>Service Pricing & Cost: Service Costing & Pricing projects and monitors costs for the management of operations, provision of service, equipment installation, etc. Based upon the projected cost and business needs, a service pricing strategy may be developed to re-allocate costs within the organization. If developed, the service pricing strategy will be documented, communicated to the users, monitored and adjusted to ensure that it is both comprehensive and fair.</p> <p>Billing & Accounting: The purpose of Billing & Accounting is to gather information for calculating actual cost, determine chargeback costs and bill users for services rendered.</p>
-------------	--

Questionnaire

Process Area	1.4 Service Pricing
--------------	---------------------

5

		Yes	No	Don't Know	N/A
1	Are projections made of all service/equipment and depreciation costs for the distributed technical environment?				
2	Are items for which chargebacks are appropriate identified?				
3	Are usage trends determined for the various services/equipment?				
4	Are budgets prepared and their accuracy/validity verified?				
5	Given service level objectives, are suitable product/service options identified?				
6	Are available products/services communicated to users?				
7	Are service costs determined, modeled and evaluated?				
8	Are cost allocation plans determined for services and equipment?				
9	Is a regularly updated catalogue of service prices made available to users?				
10	Are appropriate user parties informed of costs charged to them?				
11	Are actual costs assessed against projected costs?				
12	Are budgets and cost allocation plans reviewed with management and users?				
13	Are regular reports generated on service costs?				
14	Do appropriate parties receive service cost reports?				
15	Are usage data used to allocate chargebacks according to an appropriate chargeback algorithm?				
16	Are trending reports on chargeback results created on a periodic basis?				

Work Product list

10

Process Area	1.4 Service Pricing
--------------	---------------------

- Depreciation schedules
- Sample budget
- Service price listing or catalogue
- Chargeback algorithm or strategy
- Chargeback reports

15

User Administration (1.5)

PA Number	1.5
PA Name	User Administration
PA Purpose	User Administration handles the day-to-day tasks involved in administering users on a system. Tasks include adding new users, changing user IDs, re-establishing user passwords and maintaining groups of users.
PA's Base Practices	Receive information from Human Resources regarding employee comings and goings Add users to all necessary systems (e.g., network, mail, etc)

	Change user information on all necessary systems Delete user information on all necessary systems Notify appropriate parties periodically of user administration status
PA Goals	To establish an accurate system for user administration management. To perform timely updates to existing accounts. To perform timely deletions of accounts for security purposes To create new accounts in a timely manner so new users can be up an running on the first day.
PA's Metrics	Monthly report of user accounts added to system Percentage of user account modifications performed on time Quarterly accounts of user account deletions Operations Maintenance Status Updates

Base Practices

BP Number	1.4.1
BP Name	Receive information from Human Resources regarding employee comings and goings
BP Description	An effective communication system should be established between Human Resources and the appropriate Operations Personnel. Maintenance of this system will facilitate up to date information regarding employee arrival and departure dates.
Example	<i>HR would send a list of new hires, their start dates, and the groups or departments they will be working in to the User Administration group.</i>
BP Number	1.4.2
BP Name	Add users to all necessary systems (e.g., network, mail, etc)
BP Description	Operations Personnel should create ids/accounts (e.g., network, mail, etc.) and add users with appropriate type of access to all necessary systems and accounts.
Example	<i>Creation of new login ID for new employees with proper access.</i>
BP Number	1.4.3
BP Name	Change user information on all necessary systems
BP Description	By having established an effective communication system, user Administration personnel can schedule updates and modifications to existing user accounts.
Example	<i>Account modifications examples: Change of Name Request Modify user's Access Control Profile</i>
BP Number	1.4.4
BP Name	Delete user information on all necessary systems
BP Description	Effective communication allows personnel to schedule user account deletions on all necessary systems. (e.g. network, mail, etc.)
Example	Deletion of user accounts after employee departure or change of access when an employee moves between groups or departments.
BP Number	1.4.5
BP Name	Notify appropriate parties periodically of user administration status
BP Description	Operations environment maintenance and goal fulfillment should be documented and distribute to the appropriate parties. Depending on the urgency of the maintenance this notification to other groups can take many forms: Immediate notification – e-mail, pager Scheduled status reports or information through change control meetings
Example	<i>An immediate notification via email may be sent to service desk and networking group regarding a new network user group, its associated access properties, and list of people or groups that this will effect.</i>

References

	MODE v1 Toolkit
--	-----------------

Process Area: User Administration
Level 1

Assessment Indicators: Process Performance

Generic Practice: Ensure that Base practices are performed

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
1.5.1 Receive information from Human Resources regarding employee comings and goings	<i>Human resources supply a list of all new hires and their associated start dates.</i>	
1.5.2 Add users to all necessary systems	<i>When questioned User administration personnel can explain the defined process for the creation and addition of users to all necessary systems. (E.g. network, mail, etc.)</i>	
1.5.3 Change User Information on all necessary systems	<i>User Administration personnel follow and can describe the process for changing user account information on all necessary systems. (E.g. network, mail, etc.)</i>	
1.5.4 Delete User Information on all necessary systems	<i>Operations Personnel follow a defined process for the deletion of users on all necessary systems. (E.g. network, mail, etc.)</i>	
1.5.5 Notify appropriate parties periodically of user administration status	<i>User Administration reports are distributed on a monthly basis via e-mail.</i>	

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>A policy exists to track and coordinate user account maintenance and communication plans.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>All User Administrator personnel have the correct access on all servers, applications, and platforms that they need to perform their daily duties.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>Training Policy is in place for new User Administration Staff. The organization provides training on all defined processes, applications, and/or hardware that aids the User Administration employees in their daily tasks.</i>	
	GP2.4 Collect data to measure performance	<i>Data are collected, for: % of user accounts added to systems, quarterly accounts of user account deletions, etc.)</i>	
	GP2.5 Maintain communication among team members	<i>User Administration personnel divide up tasks and communicate the status of these tasks in a weekly status report to all User Administration personnel.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>All forms associated with providing account details for new accounts are completed and appropriately filed for tracking purposes.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>Ensure that all User Administration are filling out the correct forms to track new accounts, modifications to</i>	

		<i>accounts, and deletion of accounts.</i>	
--	--	--	--

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an IT level	<i>Procedures for updating user accounts are defined and adhered to. This includes all additions, deletions, and maintenance tasks.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>New employees receive introductory User Administration training. Personnel are regularly trained on changes to defined processes.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>Documented procedures are followed for account administration and take into consideration the business' growth rate for the year.</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>User Administration personnel have weekly meetings for status, planning for the next week, and to discuss any changes to policy, process, etc.</i>	

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>User Administration user account maintenance activities are based on defined business needs vs. industry standards.</i>	
	GP4.2 Automate data collection	<i>Metrics are automatically collected on the number of new accounts on a weekly basis, % of changes to accounts in a week, etc.</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>Ties between User Administration and Human Resources Department are in place. This tie allows for accurate scheduling regarding the comings and goings of employees. .</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>User Administration maintenance processes are revised after reviewing metrics that have been collected. (E.g. Monthly report outlining the number of user accounts added to system, % of user accounts that undergo alterations, quarterly reports of user account deletions, etc.)</i>	

5

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>Current resources and procedures are periodically assessed or altered with the intent to promote continuous improvement.</i>	
Process Change	GP 5.1:Deploy "best practices" across the IT organization	<i>Process improvements, like implementing a new creation of account form, is rolled out to the entire organization..</i>	

Process Capability Assessment Instrument: Interview Guide

5

Process Area	1.5 User Administration
Questions	
Base Practice: 1.5.1 Receive information from Human Resources regarding employee comings and goings	
How is employee start and end date information communicated? (e.g. Email, phone call, Meeting, etc.)	
How often is this information collected and distributed? Who performs these responsibilities?	
Is receipt of information confirmed? How (e.g. reply of an e-mail)?	
Which parties in the operations environment utilize the received information?	
Base Practice: 1.5.2 Add users to all necessary systems	
What is the process for creating and adding users with appropriate types of access to all necessary systems? (e.g. network, mail, etc.)	
How is the type of access to be setup determined for each account?	
Who approves and determines the creation, access level, and/or addition of access groups to user accounts?	
3. How often are these additions performed and by whom? Who approves these additions and for what purpose/reason are additions performed?	
Is there a process for confirming timely and accurate completion of these additions? If so, please describe it.	
Base Practice: 1.5.3 Change User Information on all necessary systems	
For what purpose are accounts modified?	
How are updates and modifications to established user accounts performed?	
Who authorizes changes to established user accounts?	
How often do these modifications occur? Who performs them?	
Is there a means for ensuring that changes are completed in a timely and accurate manner?	
Base Practice: 1.5.4 Delete User Information on all necessary systems	
What is the process for deleting user accounts from all necessary systems?	
Who approves deletions of established user accounts?	
How often do these deletions occur? Why are accounts deleted? Are they performed on an as needed basis or are they scheduled? Who performs the deletions?	
Does the deletion process take into consideration any security issues regarding accounts and ids? (e.g. Employee is leaving company and security policy indicates that all accounts need to be disabled and/or deleted by end of employees last day.)	
Is there a process for confirming timely and accurate completion of these deletions?	
Base Practice: 1.5.5 Notify appropriate parties periodically of user administration status	
Do appropriate parties periodically receive status reports regarding user administration maintenance?	
Who creates the user administration reports? What formats are they distributed in (e.g. Mail, Email, Meeting, etc.)	
3. How are reports distributed? How often is such information distributed and by whom?	
4. Who is the intended audience? How do the different parties utilize this information?	
Generic Questions for Process Areas	
1. How are the various additions, alterations, and deletions to user accounts prioritized? Are all potential stakeholders involved in the decision process? (e.g. Coordination with Change Control Plan, Human Resources, Operations Personnel)	
2. Are current procedures and resources periodically assessed with the intent to promote continuous improvement? What is the approval process for proposed solutions? Are these solutions evaluated for impact?	

3. Are there regularly scheduled training programs that address User Administration procedures? If so, what type of training provided?
4. Do you find that adequate resources are allocated for User Administration? Please elaborate.

Process Capability Assessment Instrument

5

Process Area	1.5 User Administration
Process Area Description	User Administration handles the day-to-day tasks involved in administering users on a system. Tasks include adding new users, changing user IDs, re-establishing user passwords and maintaining groups of users.

Questionnaire

Process Area	2.4 User Administration
--------------	-------------------------

10

		Yes	No	Don't Know	N/A
1	Do Human Resources and Operations Personnel regularly communicate information regarding employee start and end dates? (e.g. List of new hires and their start dates)				
2	Is there a formalized process for adding users to all necessary systems? (e.g. network, mail, etc.)				
3	Are modifications on existing user accounts performed and are they changed on all necessary systems?				
4	Are personnel deleting user accounts to all necessary systems in a timely manner?				
5	Is a process in place for notifying the appropriate parties on the status of user administration?				

15

Work Product list

Process Area	2.4 User Administration
--------------	-------------------------

20

- User Administration Maintenance Status Report
- New Hire List
- Termination List
- Change of Name Request Form
- Access Control Profile Document
- Network Group Access Property Document

25

Production Scheduling (2.1)

PA Number	2.1
PA Name	Production Scheduling
PA Purpose	Production Scheduling determines the requirements for the execution of scheduled jobs across a distributed environment. A production schedule is then placed to meet these requirements, taking into consideration other processes occurring throughout the distributed environment (e.g., software and data distribution, and remote backup/restoration of data.)
PA's Base	2.1.1. Identify requirements for jobs in the distributed environment

Practices	Determine what processes are taking place throughout the distributed system Schedule ad hoc jobs and tasks Manage ad hoc production orders Set production parameters Assure correctness of input data Select service class/prioritize jobs Link multi-step batch processes based on success/failure of previous jobs Initiate batch jobs to application schedule Performance and recovery planning Maintain schedule information
PA Goals	To provide backup/recovery plans for job failure To provide cross-platform hooks to send messages to operations, batch scheduling, etc.
PA's Metrics	Number of times per month that jobs exceed network capacity % of rejected ad hoc production orders Mean number of successful batch process jobs Number of terminated/cancelled jobs per month % of time successfully adhered to schedule Correlation between platform performance and job activity over time

Base Practices

BP Number	2.1.1
BP Name	Identify requirements for jobs in the distributed environment
BP Description	Use the business capability requirements to collect the technology infrastructure requirements for production scheduling. Expertise in technology architecture will be needed to extrapolate the scheduling implications of varying requirements, and to add the appropriate supporting functions to the core business capability requirements.
Example	<i>If other processes are occurring throughout the distributed environment, but not under control of a scheduling system, (e.g., testing, software and data distribution, remote backup/restoration of data, hardware maintenance, etc.), then considerations need to be incorporated into system noting platform, time, data input, device and file requirements, job owners, etc.</i>
BP Number	2.1.2
BP Name	Determine what processes are taking place throughout the distributed system
BP Description	Identify production schedules, review network traffic trend data to validate that the performance of the jobs will not be adversely impacted due to high network traffic volumes. Consider using network management monitoring processes to monitor hardware and network traffic during the execution of production jobs.
Example	<i>If backups are the only network traffic that occurs every evening from 2am until 4am and you know that your production scheduling takes an estimated 2 hours you may want to begin production-scheduled jobs at 10pm.</i>
BP Number	2.1.3
BP Name	Schedule ad hoc jobs and tasks
BP Description	Validate that jobs are not executed during high network volume periods. Use network management to define thresholds to provide notifications that a job is exceeding network capacity.
Example	<i>By looking at current network utilization and what items are scheduled that may impact the network traffic that day you can plan and schedule ad hoc jobs that may come up.</i>
BP Number	2.1.4
BP Name	Manage ad hoc production orders
BP Description	When ad hoc production orders come through many considerations, such as other processes running (backup/restoration, software distribution, etc.), need to be weighed before approving and sending the ad hoc order.
Example	<i>When ad hoc requests are considered procedures/requirements are used to modify the master computer schedule.</i>
BP Number	2.1.5
BP Name	Set production parameters
BP Description	Analyze the critical performance factors for each scheduled task. Select a mixture of support aids to maximize workforce performance in completing each task. Use network management

	to define thresholds to provide notifications that a job is exceeding network capacity.
Example	<i>Workload should be scheduled based on documented controls, including time dependencies, successor/predecessor relationships, and external or internal event dependencies.</i>
BP Number	2.1.6
BP Name	Assure correctness of input data
BP Description	Data needs to be verified to prevent down time before sending across the distributed environment.
Example	<i>Job failures can be caused by incomplete/invalid parameters supplied by customers, unavailability of files, etc.</i>
BP Number	2.1.7
BP Name	Select service class/prioritize jobs
BP Description	Expertise in technology architecture is recommended to extrapolate the scheduling implications of varying requirements, and to add the appropriate supporting functions to the core business capability requirements.
Example	<i>Prioritizing a job can be based on one/some/all of the following: time, how other jobs end, existence of input files, complex conditions, conditions on others schedulers or devices and other processes that are occurring throughout the distributed environment but not under the control of the scheduling system.</i>
BP Number	2.1.8
BP Name	Link multi-step batch processes based on success/failure of previous jobs
BP Description	Verification of the success of the batch process will start the next step in a multi-step batch process and the failure of the batch job will raise a notification. At this point the notification may page, e-mail, log the failure, restart the batch job at point of failure, or a combination of the above.
Example	<i>Graphical and audible alarms are forwarded to a central management system when performance and fault thresholds for jobs are exceeded.</i>
BP Number	2.1.9
BP Name	Initiate batch jobs to application schedule
BP Description	Nearly all applications will have at least some element of batch processing, even if it is just file backup and restore, database maintenance and reorganization, or background printing of spooled reports. For applications with significant batch processing requirements, production scheduling may be highly complex and require automated support. This will occur when batch jobs must execute frequently (daily, hourly), when there are dependencies between jobs, when multiple sites must be scheduled, or when multiple vendor platforms are needed to execute different jobs that are interdependent.
Example	<i>Where possible, jobs should be initiated automatically without requiring human intervention. If more complicated, formal job scheduling procedures should exist.</i>
BP Number	2.1.10
BP Name	Performance and recovery planning
BP Description	Performance and Recovery Planning encompasses solutions for: Monitoring job completion/failure Varying schedule to account for failures and delays Recover/rollback from failed jobs Auditing production flow Terminate/cancel jobs Modifying batch streams Verifying results Surveying production performance
Example	<i>When a job fails, various procedures need to be in place to either re-start the job or cancel the job in order to continue with other jobs. Various tools like auditing production flow, recover/rollback and results verification can assist with production scheduling.</i>
BP Number	2.1.11
BP Name	Maintain schedule information
BP Description	Make sure batch processes are starting and stopping on schedule. Revise schedule when batch jobs change and require more time, bandwidth, etc.
Example	<i>Review network management network traffic trend data. Rearrange agenda due to new batch jobs that need to be added to the schedule.</i>

	MODE v2
	MODE v1 Toolkit
	Questionnaire and Interview Resources: OpsStrat.doc, Schedpkg.doc and Opstoolsrpf2.doc

Process Area: Production Scheduling

Level 1

5 *Assessment Indicators:* Process Performance

Generic Practice: Ensure that Base practices are performed

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
2.1.1 Identify requirements for jobs in the distributed environment	<i>Documentation explaining requirements for jobs (e.g. starting conditions, dependencies, etc.).</i>	
2.1.2 Determine what processes are taking place throughout the distributed system	<i>Documented processes throughout the distributed system (e.g. production schedule).</i>	
2.1.3 Schedule ad hoc jobs and tasks	<i>Schedule of ad hoc jobs and tasks. Member of Ops staff can explain how special processing is scheduled.</i>	
2.1.4 Manage ad hoc production orders	<i>When questioned, member of staff can explain how ad hoc jobs are managed (e.g. documented controls, etc.).</i>	
2.1.5 Set production parameters	<i>Walk through of current parameters.</i>	
2.1.6 Assure correctness of input data	<i>Example of notification to customer noting submitted data is incorrect.</i>	
2.1.7 Select service class/prioritize jobs	<i>When questioned member of staff can explain how scheduling is prioritized, coordinated, etc.</i>	
2.1.8 Link multi-step batch processes based on success/failure of previous jobs	<i>Example of notification sent for failed job.</i>	
2.1.9 Initiate batch jobs to application schedule	<i>Schedule of batch jobs for applications. When questioned, staff can explain how a new application that required batch jobs was added to the schedule, approved, etc..</i>	
2.1.10 Performance and recovery planning	<i>When questioned staff can explain how jobs are canceled. Example of recovery plan for failed job.</i>	
2.1.11 Maintain schedule information	<i>When questioned, staff can explain workload balancing capabilities.</i>	

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>Production scheduling has an established and maintained policy regarding job submission procedures, batch processing, etc. and it is followed.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>Production scheduling personnel have access to software, documentation and schedules.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>Training is provided to all new production scheduling personnel regarding scheduling, software and interaction with other process areas (e.g. event management, backup and restore, etc.). Organization wide, customers are aware of production scheduling and their capabilities.</i>	
	GP2.4 Collect data to	<i>Production parameters for production</i>	

	measure performance	<i>scheduling are measured (e.g. number of terminated/cancelled jobs per month, number of batch jobs per month, etc.).</i>	
	GP2.5 Maintain communication among team members	<i>Reports are distributed noting issues/problems that have been tracked to customers, management and staff.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>All job submission forms/tickets have all fields completed for tracking performance and master scheduling purposes.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>Ad hoc and batch job submissions are kept under version control for improved production scheduling purposes.</i>	

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an organization level	<i>There is one master production schedule for the organization vs. individual schedules throughout.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>New employees receive training and subsequent training is provided regarding new software, technology, procedures, etc. Future staff requirements are also addressed.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>Production scheduling submissions are always handled according to the stated policy vs. ad hoc processes.</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>Feedback to production scheduling is provided via reports, e-mail or comments section within the job submission form.</i>	

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Production scheduling is based on strategic needs vs. industry standards.</i>	
	GP4.2 Automate data collection	<i>Metrics are automatically collected from the production scheduling software/tool, for example: % of time successfully adhered to schedule, platform performance and job activity correlation, etc.</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>Metrics automatically collected by production scheduling are analyzed and reported. Production scheduling software tools updates backup and restore of any problems/interruptions.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>Production scheduling is evaluated against performance goals and metrics for suggested improvements and revisions to the process.</i>	

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators

			at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>Production scheduling is continuously improved via incremental changes, an example: the addition of an under used impact printer for invoice printing during non-peak times.</i>	
Process Change	GP 5.1:Deploy “best practices” across the organization	<i>Process improvement noted in 5.1 example is validated via metrics and business goals, for example: additional use of a resource provides a 3% increase of on schedule output and a 6% decrease in production scheduling exceeding network capacity.</i>	

Process Capability Assessment Instrument: Interview Guide

Process Area	2.1 Production Scheduling
--------------	---------------------------

Questions
Base Practice: 2.1.1 Identify requirements for jobs in the distributed environment
1. What types of controls are used when scheduling jobs (e.g. starting conditions, dependencies, etc.)?
2. What platforms are supported (e.g. local control of single device, remote control of single device, remote control of multiple but independent devices, etc.)?
3. What dependencies are encountered when scheduling jobs (e.g. valid input data, time, how other jobs end, input files, other schedules, other devices, etc.)?
4. What new requirements for service have been identified?
Base Practice 2.1.2 Determine what processes are taking place throughout the distributed system
How many production schedules are there? How are they maintained? By whom?
How often is the network traffic trend data reviewed for job performance?
Is the hardware and network traffic currently monitored during job execution? If yes, how?
4. Is file transfer and control considered? By whom? How?
5. Is print and report management considered? By whom? How?
6. Is system startup and shutdown considered? By whom? How?
7. Is mass storage, backup/restore and archiving considered? By whom? How?
8. Are adequate resources provided so an inventory of all processes are considered?
9. If changes should occur with SLA management, who handles these requests and how?
Base Practice: 2.1.3 Schedule ad hoc jobs and tasks
1. What procedures are in place for customers who request special processing and modification of the master schedule?
2. How are ad hoc jobs prioritized?
Base Practice: 2.1.4 Manage ad hoc production orders
1. Are documented controls, including time dependencies, successor/predecessor relationships, and external or internal event dependencies evaluated prior to acceptance of ad hoc jobs? If yes, by whom and how?
2. Are ad hoc jobs scheduled during a specific time of day or when processing power is available?
Base Practice: 2.1.5 Set production parameters
Is the network analyzed for critical factors to maximize workforce performance?
What production parameters does the system current address/measure?
What network management tools define/identify thresholds and provide notifications that a job is exceeding network capacity?
How does the manual/automated scheduling system handle an abnormal event like a job submitted with missing/invalid parameters?
Base Practice: 2.1.6 Assure correctness of input data
1. How is information validated prior to jobs being scheduled?
2. If input data is incorrect or unavailable, how is notification sent to the original customer requesting the job?
Base Practice: 2.1.7 Select service class/prioritize jobs
How does the scheduling tool, automated or manual, coordinate job submissions/prioritizing (e.g.

utilizing job dependencies, data set, events or physical calendar)?
Is there one master production schedule for prioritizing purposes? If not, how many are there and what are their functions?
Base Practice: 2.1.8 Link multi-step batch processes based on success/failure of previous jobs
1. What procedures are in place for initiating, monitoring or stopping jobs?
2. What type of notification is sent/alert system is provided due to a job failure?
How is verification sent that a job has been successfully completed?
Base Practice: 2.1.9 Initiate batch jobs to application schedule
1. Can tasks be initiated and managed on key server platform? On other server platforms?
2. Which applications require significant batch processing? Is this done daily, hourly?
3 Is a separate scheduling component available or managing batch process?
Base Practice: 2.1.10 Performance and recovery planning
1. Are jobs monitored for completion/failure?
2. How is the production schedule changed to account for failures and delays?
3. How does one recover/rollback from failed jobs? Is it automatic?
4. Can batch streams be modified?
5. What is the procedure for terminating or canceling jobs?
6. When is production performance surveyed and results verified?
Base Practice: 2.1.11 Maintain schedule information
1. Describe any workload balancing capabilities provided?
2. Are forecasting mechanisms available? When/how are they used?
3. What reports are produced that provide network traffic data?
4. What tools are used to quantify that the production schedule is meeting goals?
5. What other historical data is used to maintain performance?
Generic Questions for Process Area
1. What are the procedures/policies for the current version of production scheduling? (e.g. Process of submitting a job.)
2. What reports are produced for management, operations and customers that show production performance measurements and verifications? How are these used to manage the production scheduling process?
3. Explain the training provided to the production scheduling staff regarding procedures, systems and interaction with other functions and their importance (e.g. event management, backup and restore, fault recovery, etc.)?
4. Is the process/procedure for production scheduling reviewed for continuous improvement? If yes, how?
5. Has there been a shortage of resources while performing the production scheduling process?
6. When continuous improvements are executed, how is the improvement validated against business and performance goals (e.g. benchmarks, basic measurements, etc.)?
7. What objectives are established to measure the quality of operation standards and processes?
8. What reports are distributed to customers, management and staff that provide feedback/verify adherence regarding the production scheduling process/procedure?

Process Capability Assessment Instrument

Process Area	2.1 Production Scheduling
Process Area Description	Production Scheduling determines the requirements for the execution of scheduled jobs across a distributed environment. A production schedule is then placed to meet these requirements, taking into consideration other processes occurring throughout the distributed environment (e.g., software and data distribution, and remote backup/restoration of data.)

5 Questionnaire

Process Area	2.1 Production Scheduling
--------------	---------------------------

		Yes	No	Don't Know	N/A
1	Are requirements identified for jobs in the distributed environment?				

2	Is a determination made of what processes are taking place throughout the distributed system?				
3	Are ad hoc jobs and tasks scheduled?				
4	Are ad hoc production orders managed?				
5	Are production parameters set?				
6	Is the correctness of input data assured?				
7	Are service classes/job priorities selected?				
8	Is multi-step linking of batch processes based on success/failure of previous jobs?				
9	Are batch jobs initiated to the application schedule?				
10	Is job completion/failure monitored?				
11	Is the schedule varied to account for failures and delays?				

Work Product list

5

Process Area	2.1 Production Scheduling
--------------	---------------------------

Example of an existing production schedule and work flow diagrams

Existing operating procedure manuals

Software scheduling software documentation, detailed and quick reference

10 Examples of custom (or packaged) screens prompting for scheduling information needed to execute jobs or job streams

Phone list of who to call for different types of problems

Existing reports that analyze business customers performance

Existing reports that review network traffic and hardware during the monitoring process

15 Existing reports that review network traffic trend data to validate job performance

Results of any network performance testing across the network. (e.g. RMON, SNMP, etc.)

Output/Print Management (2.2)

PA Number	2.2
PA Name	Output/Print Management
PA Purpose	Output and Print Management monitors all of the printing done across a distributed environment and is responsible for managing the printers and the printing for both central and remote locations.
PA's Base Practices	Re-initialize printers Suspend print jobs Restart print jobs Send job to remote printer Redirect printing to another printer Batch print jobs Print forms
PA Goals	To provide end-to-end print management capabilities. To provide cross-platform hooks to send messages to operations, etc.
PA's Metrics	Average amount of time that print queue is in suspension Number of batch print jobs per month Number of remote location print transactions per month

20

Base Practices

BP Number	2.2.1
BP Name	Re-initialize printers
BP Description	Re-initializing printers can be powering on/off a printer to starting/stopping a print queue in a distributed environment.
Example	<i>By powering off a printer all data that has been sent to the printer queue will be deleted. This can be particularly helpful in a situation such as this; if a postscript print job gets sent to a printer that cannot handle postscript.</i>
BP Number	2.2.2

BP Name	Suspend print jobs
BP Description	Hold a print job in the print queue without deleting or removing the print job. The print job will then be printed at a later time when the suspense is removed.
Example	<i>A printer may be printing documents on paper with letterhead that should not be printed on letterhead. Instead of deleting all print jobs in a queue the print jobs are suspended so that the correct paper can be inserted into the printer.</i>
BP Number	2.2.3
BP Name	Restart print jobs
BP Description	Initializing a file/document to be sent to a print queue for printing on your distributed environment. If a print job has been suspended you can restart a print job by removing a suspense on a printer so that print job that has been sent to the print queue can print.
Example	<i>As in the example above in 2.2.2 the documents that were suspended can easily be unsuspending to resume printing.</i>
BP Number	2.2.4
BP Name	Send job to remote printer
BP Description	In a distributed environment it is possible to send a file or document to a remoter printer over a LAN/WAN line.
Example	<i>By attaching to a printer at a remote location on a WAN line you can send a print job to a printer in another office.</i>
BP Number	2.2.5
BP Name	Redirect printing to another printer
BP Description	Sending the file/document from one print queue to another print queue without intervention from the initial sender of the print job. This allows printing to continue to another printer while the initial printer is not in service. By having this transparently happen on the server end the customer community is not forced to individually change their default printer.
Example	<i>A printer may need service and have several print jobs in its queue. The print jobs in the queue can be redirected to another printer close by without customer intervention.</i>
BP Number	2.2.6
BP Name	Batch print jobs
BP Description	With large documents it is more efficient to send the print job in batch during a low usage time (e.g., over night) to prevent reduction of productivity.
Example	<i>If you need a 150 page document printed, instead of tying up a printer during the day you fill the paper tray before you leave and schedule a print job to take place early in the morning (e.g. 4:00am) and it can be printed when you come into the office. Many desktop operating systems have a scheduling option. For Windows 95 and NT it is located under Start, Settings, Printers, and under the properties of the printer you will be printing to.</i>
BP Number	2.2.7
BP Name	Print forms
BP Description	When printing forms (i.e., invoices) there may requirements such as special paper, special ink, manual feeds, special feeder for the printer, etc.
Example	<i>Some forms that may involved this are: Collate and pack forms Label output parcels Distribute parcels</i>

References

	MODE v2
	MODE v1 Toolkit

Process Area: Print Management

Level 1

5

Assessment Indicators: Process Performance

Generic Practice: Ensure that Base practices are performed

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
---------------	---------------------------------	---------------------------------

2.2.1	Re-initialize printers	<i>Example of instructions on how to re-initialize.</i>	
2.2.2	Suspend print jobs	<i>Print jobs can be suspended.</i>	
2.2.3	Restart print jobs	<i>Print jobs can be restarted.</i>	
2.2.4	Send job to remote printer	<i>Print jobs can be sent to a remote printer.</i>	
2.2.5	Redirect printing to another printer	<i>Print jobs can be redirected to another printer.</i>	
2.2.6	Batch print jobs	<i>Schedule of batch jobs.</i>	
2.2.7	Print forms	<i>Forms printing takes place throughout the distributed network.</i>	

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>Policy for print management exists and is followed. Print queues and jobs are monitored and managed across the organization according to procedure.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>All print management personnel have access to documentation, reports, technology and software, when needed, to perform the tasks at hand.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>Training policy in place for new print management personnel. Organization wide customers are aware of print management options that are available.</i>	
	GP2.4 Collect data to measure performance	<i>Data are collected, for example: number of batch jobs per month, number of remote print jobs per month, etc.</i>	
	GP2.5 Maintain communication among team members	<i>Feedback regarding issues from customers, management, and other process areas are tracked and reported via e-mail, reports, meetings, etc.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>Report or monitoring software and/or reports are complete with all information regarding a print job, leaving no fields or variables blank for interpretation.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>Print management software and or reports accommodate version control to reflect the most current changes to a print job.</i>	

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an organization level	<i>There is one centralized print management system versus individual or independent use of</i>	

		<i>various systems.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>New print management personnel are trained and receive subsequent training on new technologies, equipment, procedures, etc. Future employment needs are also considered.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>Print management print jobs are always handled according to policy vs. ad hoc.</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>Print management receives feedback via, e-mail, reports and meetings from customers and other process areas regarding issues, approvals and reviews.</i>	

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Print management is based on strategic business needs vs. industry standards.</i>	
	GP4.2 Automate data collection	<i>Metrics are automatically collected via the print management tool vs. manually.</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>Print management has adequate software, reports, equipment and technology to analyze metrics. Print management tools are tied to capacity planning and modeling for statistical purposes.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>Print management is evaluated against performance goals and metrics for suggested improvements and revisions to the process.</i>	

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>Print management is continuously improved via incremental changes, an example: new policy changes note that any job over 150 pages is to be forwarded for batch processing.</i>	
Process Change	GP 5.1: Deploy “best practices” across the organization	<i>Process improvement in 5.1 example is validated via metrics and business goals: 8% decrease in print job suspensions and a 4% increase in successful jobs completed for the month.</i>	

5 Process Capability Assessment Instrument: Interview Guide

Process Area	2.2 Print Management
--------------	----------------------

Questions
Base Practice: 2.2.1 Re-initialize printers
Can all printers throughout the distributed network be re-initialized? If yes, how often is this done? Who typically performs this task?
Are instructions provided to the customer on how to re-initialize? If yes, how (e.g. plaques on walls, e-mails, signs on the physical printer itself)?
Base Practice: 2.2.2 Suspend print jobs
How often are print jobs placed on hold due to paper change or letterhead stock requirements?
How long is a printer in a suspended state generally before it is restarted? Who takes it out of its suspended state?
Are there certain printers that are affected by suspended print jobs more so than others? If yes, why?
Base Practice: 2.2.3 Restart print jobs
Have there been any problems restarting a print job? If yes, what types of problems?
2. When restarting a print job, is it always confirmed that the correct paper, tray, or ink is in place?
Base Practice: 2.2.4 Send job to remote printer
1. Are reports forwarded to various printers within the distributed network for distribution purposes?
2. Do you use distribution lists to control sending remote print jobs? Is there a contact person who can place recipients on and off a distribution list?
Base Practice: 2.2.5 Redirect printing to another printer
1. Can print jobs be sent from one print queue to another without customer intervention? If so, how? Who redirects the print job?
What are the reasons that a print job would be redirected to another printer (e.g. off-line, out of paper, powered off, busy)?
Base Practice: 2.2.6 Batch print jobs
1. Are customers made aware of the batch print feature? How?
2. What is the typical length of time and size of a batch print job?
3. Do you schedule your batch print jobs during certain hours of the day? If yes, when?
4. Is there a software program that manages and monitors this process or does an administrator need to schedule and oversee? If yes, what is the process?
Base Practice: 2.2.7 Print forms
1. Does the output/print management personnel review forms prior to their use throughout the distributed system? Reports? How is this process of approval managed (e.g. meetings, requests, sample stock, test runs, etc.)?
2. Can forms be collated and packed?
3. Are there certain printers on the network where confidential forms/output is directed to? If yes, how are those printers managed (e.g. locked closet, attendant, specific time frame, etc.)?
4. How many different types of preprinted forms are used? How many standard paper stock reports are produced? Of these forms, how many are multi-part?
Generic Questions for Base Practice
1. Are customers able to access a master map or listing printer types and locations available to them? If yes, who updates this information?
2. Are customers notified of any delays or problems with regards to their print jobs? If yes, how are they informed (e.g. broadcasts messages, e-mails, phone mail, etc.)?
3. What type of training is provided on the procedure/policy regarding output/print management? Is it followed? When is it provided (e.g. orientation, new hire review, process change meetings, etc.)?
4. Is there a standard procedure provided on how to perform output/print management? How is this documented/maintained (e.g. hardcopy, manual, service procedure updates)?
5. What measurements are used to qualify and quantify the output/print management process?
6. Are there enough resources for output/print management (e.g. printers, supplies, personnel, software, etc.)?
Are there any business or processing goals for the output/print management process? If yes, what are they? How are they qualified and quantified?
8. Is the output/print management consistently review for continuous improvement for business and process aspects? If yes, are these recommendations acted on and tracked for their results?

Process Capability Assessment Instrument

Process Area	2.2 Print Management
Process Area Description	Output and Print Management monitors all of the printing and/or done across a distributed environment and is responsible for managing the printers and the printing for both central and remote locations.

Questionnaire

Process Area	2.2 Print Management
--------------	----------------------

5

		Yes	No	Don't Know	N/A
1	Are printers re-initialized to start or stop a print queue?				
2	Can a print job be suspended without deleting or removing the job from the print queue?				
3	Can a print job be released from a suspend status?				
4	Are print jobs sent to printers at a remote site over the LAN/WAN?				
5	Can a print job in a queue be re-directed to another printer, if the original printer is out of service, without a customer intervening?				
6	Are large documents printed in batches during low usage times to increase efficiency?				
7	Are there any special forms, equipment, and/or supplies needed to produce some print jobs?				

Work Product list

Process Area	2.2 Print Management
--------------	----------------------

10

- Operator's manual for output/print management personnel
- Customer's manual for available output/print resources
- Examples of any forms/paper stock used for non-typical print jobs
- List of equipment/supplies used for non-typical print jobs (e.g. feeders, inks, etc.)

15

File Transfer and Control (2.3)

PA Number	2.3
PA Name	File Transfer and Control
PA Purpose	File Transfer and Control initiates and monitors the files being transferred throughout the system as part of the business processing (e.g., nightly batch runs). File transfers can take place in a bi-directional fashion between hosts, servers and workstations.
PA's Base Practices	2.3.1 Transfer files on a scheduled basis 2.3.2 Determine backup and recovery scheme 2.3.3 Transfer files on an ad hoc basis 2.3.4 Location, format, and file verification
PA Goals	To provide file transfers and control across different platforms. This may require the support of different file types and formats. To implement a file transfer package that offers APIs with functionality to measure success/failure return codes, and the capability to check for space availability.
PA's Metrics	Number of file transfer events per month % of failed file transfers per month Percentage of file transfer events diverging from planned schedule

Base Practices

BP Number	2.3.1
BP Name	Transfer files on a scheduled basis
BP Description	Some issues to address when scheduling a file for transferring: Determine schedule of file transfers to and from devices

	Determine if you can perform concurrent file transfers Initiate file transfers by either sender or receiver (i.e., either can initiate the transfer)
Example	Concurrent File Transfers can take place from <i>Single machine to single machine</i> <i>Single machine to multiple machines</i> <i>Multiple machines to multiple machines</i>
BP Number	2.3.2
BP Name	Determine backup and recovery scheme
BP Description	Log file transfer events Retry a failed file transfer Invoke the backup/recovery plan for a file transfer Check that a file transferred successfully Notify of a successful/failed file transfer attempt
Example	<i>Once a month, test whether a failed file transfer invokes the backup/recovery plan.</i>
BP Number	2.3.3
BP Name	Transfer files on an ad hoc basis
BP Description	Some issues to address when transferring a file on an ad hoc basis: Determine if you can perform concurrent file transfers Initiate file transfers by either sender or receiver (i.e., either can initiate the transfer)
Example	<i>A scheduled file transfer is being done from a remote system to a host. A second remote system initiates an ad hoc file transfer, due to urgency of needed material, with the first remote system, who is currently in the middle of a scheduled file transfer. The file transfer and control system is set up to handle multiple transfers and both remote systems and the host complete file transfer successfully.</i>
BP Number	2.3.4
BP Name	Location, format, and file verification
BP Description	Determine if the file to be transferred exists Determine and check the version of the file to be transferred Determine if there is room on the recipient machine for the file Dynamically allocate space for file Convert file types (e.g., VSAM, PDS, etc.) Convert file formats (e.g., ASCII to EBCDIC) Encrypt/decrypt file being transferred Compress/decompress file at source and at target Rename file at source and/or target Create, write over or delete files Merge or append to transferred files
Example	<i>File Transfer Type Considerations include:</i> <i>Host to Host</i> <i>Remote System to Host</i> <i>Remote System to Remote System</i>

References

	MODE v2
	MODE v1 Toolkit

Process Area: File Transfer and Control

Level 1

5

Assessment Indicators: Process Performance

Generic Practice: Ensure that Base practices are performed

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
2.3.1 Transfer files on a scheduled basis	<i>A schedule referencing file transfer and control attributes, for example: types of files, sizes, platforms, time and requestor, etc.</i>	

2.3.2 Determine backup and recovery scheme	<i>File transfer and control personnel can explain failure notifications, number of re-tries a system attempts automatically, etc.</i>	
2.3.3 Transfer files on an ad hoc basis	<i>Ad hoc file transfers are requested and deployed. When questioned, staff can explain how ad hoc file transfers are handled.</i>	
2.3.4 Location, format, and file verification	<i>Complete procedure for all file transfers include, verification, space, conversion, encryption, compression/decompression, etc. Log of file transfers.</i>	

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>A policy regarding file transfer and control procedures and is followed.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>The file transfer and control group has the appropriate software, computer access and specification information to complete the procedures.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>New file transfer and control personnel are trained on the procedures and technologies used. Organization wide customers are aware of file transfer and control capabilities.</i>	
	GP2.4 Collect data to measure performance	<i>Data are collected, for example: number of file transfer events per month, % of failed file transfers per month, etc.</i>	
	GP2.5 Maintain communication among team members	<i>Notification of a failure is forwarded to fault management for tracking/issues purposes. Feedback is provided via e-mail, meetings, etc.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>A log showing all file transfer events noting file transfer and control issues/problems and successes.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>Version control is kept on file transfer schedule and backup/recovery scheme.</i>	

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an organization level	<i>All file transfers are completed via the stated policy vs. ad hoc methods.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>File transfer and control provides reports noting problems, issues or technology changes to customers and other process areas. Feedback should also be included.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>There is one centralized file transfer and control group for the organization vs. each department or group doing the procedure</i>	

		<i>independently.</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>New employees within file transfer and control receive training and subsequently attend training to update them on new skills, process, technologies, etc. Future employee requirements are addressed.</i>	

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Addressing and responding to file transfer and control issues based on strategic business needs vs. industry standards.</i>	
	GP4.2 Automate data collection	<i>Metrics are automatically collected from automated tracking software vs. a manual collection, for example: number of ad hoc file transfers per month, average size of file transferred, breakdown of file types per month, etc.</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>Metrics collected are analyzed by file transfer and control personnel and reported upon. File transfer and control software tool is tied to fault management indicating error/problem with process.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>File transfer and control is evaluated against performance goals and metrics for suggested improvements and revisions to the process.</i>	

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>File transfer and control is continuously improved via incremental changes, an example: a new compression technique is deployed for files larger than 20 MB</i>	
Process Change	GP 5.1:Deploy “best practices” across the organization	<i>Process improvement noted in 5.1 example is validated via metrics and business goals, for example: % of failures decrease by 17% and overtime decreased by 4% due to fewer recovery tasks.</i>	

Process Capability Assessment Instrument: Interview Guide

5

Process Area	2.3 File Transfer and Control
--------------	-------------------------------

Questions
Base Practice: 2.3.1 Transfer files on a scheduled basis
1. Has the schedule of file transfers to and from devices been determined? If yes, what is the schedule? Who is responsible for this task? Is it under version control? Does the schedule encompass all aspects of the service provider at the organizational level?

Can file transfers be initiated by the sender and/or the receiver? What is their customer level (e.g. administrator, all customers, some customers, etc.) and do they write scripts or assign priorities levels via an interface?
Can concurrent file transfers be performed? If yes, please explain how?
Can automated conditional file transfers be performed? If yes, please explain how?
Base Practice 2.3.2 Determine backup and recovery scheme
Are file transfer events logged? If yes how and is this information kept for historical purposes?
Are failed file transfers retried? If yes, by whom or is it automatic?
Has the backup/recovery scheme for a file transfer been invoked? If no, why? If yes, what was the end result (e.g. lost data, transfer complete, etc.)? Who is responsible for creating scheme and is it under version control?
Is there notification of a successful/failed file transfer? If yes, how is this performed (e.g. e-mail, banner message, report, etc.) and to whom (e.g. administrator, initiator, etc.)? Is fault management made aware of failures? If yes, how?
Is there a check for successful file transfers? If yes, how are these checks performed and logged?
Base Practice: 2.3.3 Transfer files on an ad hoc basis
Are files transferred on an ad hoc basis? If yes, what are the most common reasons and by whom? Do these transfers interfere with other process areas (e.g. production scheduling, output/print management, etc.)?
Who can perform or initiate an ad hoc file transfer (e.g. administrators, all customers, customers with permission, etc.)? Is it performed by senders, receivers or both?
Can ad hoc files be transferred concurrently? If yes, please explain how this is being done?
Base Practice: 2.3.4 Location, format, and file verification
Can space for a transferred file be dynamically allocated? If no, what is the customers recourse if there is a problem?
Can file types (e.g. VSAM, PDS, etc.) be converted? If yes, what is the most common? How are they converted? What tools do you use to convert them?
Have file formats (e.g. ASCII to EBCDIC) been converted? If yes, what is the most common? What tools do you use and how are they converted?
4. Are files being compressed/decompressed at source and at target? If yes, how?
5. Can files be renamed at source and/or target? Can files be created, written over or deleted? If yes to either, please explain the process of how this is done.
6. Can transferred files be merged or appended to? If yes, is this method used often?
7. What are the most common platforms encountered during file transfer? Has there been a problem with any particular platform? If yes, explain.
Are files transferred being encrypted/decrypted? If no, why? If yes, please explain how? What tools are being used?
Generic Questions for Process Area
Are file transfer times defined and/or evaluated for number of destinations, machines and platforms? If yes, explain?
Is there a policy established and maintained for file transfer and control? Is this process followed?
3. Are adequate resources available for file transfer and control? If no, explain?
4. Is training provided for all new employees within file transfer and control? If no explain? Are subsequent training times available for file transfer and control personnel to learn new processes, technologies, etc.? If yes, explain. Are proactive plans made for future personnel needs? If yes, explain.
5. Are reports to customers, administration and other groups provided as a means for process update and feedback? If yes, who gets these reports. If no, explain how feedback is provided?
Is the file transfer and control process and procedure reviewed for continuous improvement purposes? Are these improvements deployed and measured against process and business goals?
Are strategic goals in place for file transfer and control? If yes, what are they and can they be measured? Are metrics collected on the file transfer and control process? Is this process automated with use of software, tools, etc.? Are the metrics analyzed for process parameters and deviation identification?

Process Capability Assessment Instrument

Process Area	2.3 File Transfer and Control
Process Area Description	File Transfer and Control initiates and monitors the files being transferred throughout the system as part of the business processing (e.g., nightly batch runs). File transfers can take place in a bi-directional fashion between hosts, servers and workstations.

Questionnaire

5

Process Area	2.3 File Transfer and Control
--------------	-------------------------------

		Yes	No	Don't Know	N/A
1	Are files transferred on a scheduled basis?				
2	Is a backup and recovery scheme in place?				
3	Are files transferred on an ad hoc basis?				
4	Are the files verified for existence, version and space within target machine?				
5	Are the file formats and types always known?				

Work Product list

10

Process Area	2.3 File Transfer and Control
--------------	-------------------------------

Sample of a file transfer and control schedule

Sample of a backup and recovery scheme

15

List of file types and formats used during file conversions

Reports metrics, concerns and/or issues regarding file transfer and control

Network Services (2.4)

PA Number	2.4
PA Name	Network Services
PA Purpose	<p>Network Services is comprised of the following two areas:</p> <p><i>Directory Services:</i> is the function of publishing and maintaining organized inventories of information resources to make them available to networked customers. Directory Management can apply to internal directories as well as the publishing of directory information for global directory services.</p> <p><i>DNS:</i> ensures that IP services such as WINS and DHCP are provided to devices within an enterprise. Whether dealing with a new or existing capability, the communications address management function demands that high-level business requirements be taken into consideration.</p>
PA's Base Practices	<p><i>Directory Services:</i></p> <ul style="list-style-type: none"> 2.4.1 Populate directories 2.4.2 Manage directories 2.4.3 Determine organizational impacts 2.4.4 Extract information from directories 2.4.5 Identify component options <p><i>DNS:</i></p> <ul style="list-style-type: none"> 2.4.6 Document strategic drivers 2.4.7 Outline guiding principles for Communication Address Planning 2.4.8 Address and domain maintenance 2.4.9 Address capacity planning 2.4.10 Address design 2.4.11 IP technology research process
PA Goals	<p><i>Directory Services:</i></p> <ul style="list-style-type: none"> To reduce the risk of lost or misplaced files To ensure ease in managing access to confidential folders and files

	<p><i>DNS:</i> To ensure that uninterrupted addressing services are provided to devices within an enterprise.</p>
PA's Metrics	<p><i>Directory Services:</i> % of lost or misplaced files per month % of employees with restricted directory access Number of times per month communication between directories is disrupted</p> <p><i>DNS:</i> Average number of IP addresses available % of IP or DNS problems reported per month average response time to IP or DNS Problems % of customers experiencing down time due to IP and DNS issues</p>

Base Practices

Directory Services	
BP Number	2.4.1
BP Name	Populate directories
BP Description	Initially, directory information needs to be entered for the entities that will make up the directories.
Example	<i>Examples of first time information:</i> <i>Login ID</i> <i>Password information</i>
BP Number	2.4.2
BP Name	Manage directories
BP Description	Maintain organization of directories- ensure content is organized in a manner that supports logical, easy access.
Example	<i>Tasks may include:</i> <i>Maintain organization of directories- ensure content is organized in a manner that supports logical, easy access.</i> <i>Manage capacity- monitor and manage the volume of content that resides in directories.</i> <i>Manage relationships between directories- an internet firewall may maintain its own proprietary directory structure for authorized customers, but may depend on the contents of a LAN directory which is the master list of customers who should have access to network resources.</i> <i>Manage directory content- maintain the content of directories for all system components.</i> <i>Synchronize directories- ensure consistent directory contents when using Directory Synchronization distributed directories.</i>
BP Number	2.4.3
BP Name	Determine organizational impacts
BP Description	Take into consideration the primary drivers that will determine the appropriate structure of a directory management organization.
Example	<i>Centralized or distributed- within a single directory domain, an organization may implement a centralized or distributed directory management approach.</i>
BP Number	2.4.4
BP Name	Extract Information from directories
BP Description	Directories become a primary source of enterprise management information, and the process of extracting data will become important.
Example	<i>Information can be pulled from Network customer directories and Management Information Bases (MIBs) which contain extensive information about authentication, configuration, and access control profiles of the networked customers.</i>
BP Number	2.4.5
BP Name	Identify component options
BP Description	There are both physical and logical components required in directory management.
Example	<i>Physical Components may include:</i> <i>Directory standard</i> <i>Directory servers</i> <i>Directory interfaces</i> <i>Directory Administration interface</i> <i>Logical Components may include:</i>

	<i>Personal (name, address...) Security access profile Customer specific configuration Assets (hardware and software license to the customer)</i>
DNS	
BP Number	2.4.6
BP Name	Document strategic drivers
BP Description	Document characteristics of the environment. This will determine the nature of the IP services required.
Example	<i>Map all IP addresses and domains that exist, and project network traffic.</i>
BP Number	2.4.7
BP Name	Outline guiding principles for Communication Address Planning
BP Description	Guiding principles will allow the development team as well as the enterprise to share a common vision for the communications addressing function and will help manage expectations.
Example	<i>Guiding Principle Areas: Centralized versus distributed management Security Application/Infrastructure Customer Population Profile Business change profile Integration strategy with business partners</i>
BP Number	2.4.8
BP Name	Address and domain maintenance
BP Description	Adding, deleting, maintaining, and modifying any IP address information or Domain information on the enterprise's network.
Example	<i>The following tasks are example of address and domain maintenance: Move, add, and change to any IP/Domain information on the network Configure DHCP Perform updates to version control Add/Modify New IP segments Monitor and adjust lease times for DHCP addresses Install/Upgrade IP Management software Establish and maintain version control for IP address tables. Maintain DNS Design and implement subnet masking strategy Add/modify Domain names</i>
BP Number	2.4.9
BP Name	Address capacity planning
BP Description	This can include the following tasks: Determine the availability of addresses Procure addresses from appropriate organizations
Example	<i>A Network Manager, with a complete view of the organization's telecommunications infrastructure, can use his knowledge of the current business drivers and volume (number of employees and bandwidth) to assist in determining/predicting the future capacity needed for IP.</i>
BP Number	2.4.10
BP Name	Address design process
BP Description	Translate business and technical requirements into a workable network design.
Example	<i>A Visio flow chart of an IP address business and technical flows are helpful in determining where network conflicts or business process incompatibility may arise.</i>
BP Number	2.4.11
BP Name	IP technology research process
BP Description	Research emerging technologies that could contribute to Communications Address Management. Perform business case analysis for implementation of new technologies.
Example	<i>A research person or team, with knowledge of the current address management system, can be established to look into DHCP administration tools and look for improvements or add on to the current system.</i>

References

	MODE v2
	MODE v1 Toolkit

5

Process Area: Network Services

Level 1

Assessment Indicators: Process Performance

Generic Practice: Ensure that Base practices are performed

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
2.4.1 Populate Directories	<i>A formalized process for populating any and all new directories is followed by all Network Services personnel. (E.g. When rolling out a new domain, all necessary access information is entered.)When questioned, personnel can describe this process.</i>	
2.4.2 Manage Directories	<i>A schedule of directory maintenance tasks (such as scanning for viruses) is available.</i>	
2.4.3 Determine Organizational Impacts	<i>Directory Management Structure takes the company's organizational structure into consideration. (E.g. centralized or distributed approach) An example of how the organizational structure and needs are taken into consideration is: HR has their own private directory with access to confidential data restricted to HR personnel.</i>	
2.4.4 Extract Information from Directories	<i>The current system regularly checks and collects appropriate network directory information (e.g. Configuration information, authentication, etc.) for reporting and trending purposes. Such reports are available.</i>	
2.4.5 Identify Component Options	<i>Inventory list of the various network components that are assessed (E.g. Physical and Logical Components) are consistently assessed and inventoried.</i>	
2.4.6 Document Strategic Drivers	<i>A process is in place that tracks present and future directory management trends. Network Services personnel are aware of this process and act in accordance with this process. For example, a large influx of new employees would necessitate more disk space and personal directories to be created. The Network Services team is prepared to handle this flux.</i>	
2.4.7 Outline guiding principles for Communication Address Planning	<i>A document specifying network-capacity guidelines is available. The guidelines take into consideration security, geographic location, and other business needs or requirements.</i>	
2.4.8 Address and Domain Maintenance	<i>A schedule is available for address and domain maintenance tasks like configuring DHCP, performing updates to version control, and maintaining DNS.</i>	
2.4.9 Address Capacity Planning	<i>Future IP capacity needs are anticipated and tracked by looking at trending growth from the past couple years and the business direction or strategy.</i>	
2.4.10 Address Design Process	<i>A process is in place for the overall communications address design. The business and technical requirements, such as the defined protocol, are taken into consideration for Address Management. A Visio chart is then developed to map IP address, business, and technical flows.</i>	
2.4.11 IP Technology Research Process	<i>There is a review process in place for assessing and evaluating the relevancy of new emerging technologies.(E.g. Business Case Analyses are performed on new technologies)</i>	

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>A policy exists for the personnel to coordinate and track Directory management and communications address management plans and processes.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>Tools are in place to facilitate and track IP addresses. This Address Management step ensures that IP Addresses are available for all customers who need to access the network.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>Training Policy is in place for new Directory and Address Management Staff. The organization provides training on all defined processes and applications used by the Network Services team.</i>	
	GP2.4 Collect data to measure performance	<i>Data are collected, for example: Average number of available IP Addresses, % of loss or misplaced files in a month, % of employees, average DNS or IP issue response time, etc)</i>	
	GP2.5 Maintain communication among team	<i>Conflicts and network alterations are addressed and communicated to the Service Desk Monitoring, and Performance Management group</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>Work orders for additional IP addresses are filled out, processed, and filed for historical tracking.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>The relationship between different directories is continuously maintained. (E.g. The synchronization of two directories.)</i>	

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an organization level	<i>Personnel are able to perform Directory or Communications Address Management functions in a consistent and repeatable manner..</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>When Network Management tasks are distributed, success of the tasks are ensured by common resources such as tools, training and a company vision or direction.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>Network Services takes into consideration the growth of the</i>	

		<i>company when planning for hiring, updating systems with new technology, and other tools that may make their tasks manageable.</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>Monitoring group provides performance reports on address management to the Network Services Team.</i>	

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>A characteristic of the environment may be that the business requires 24-hour network availability. This can be set as a threshold and monitored for following this business requirement or driver.</i>	
	GP4.2 Automate data collection	<i>Metrics are automatically collected from the Directory and Address Management tools. (vs. Manual collection)</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>Tools to monitor and measure Network Services are in place. These tools distribute reports and send notifications to appropriate parties.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>Directory and Address maintenance processes are revised after reviewing collected metrics (E.g. % of loss or misplaced files per month, % of IP or DNS issues reported monthly, average response time to IP or DNS issues, etc.)</i>	

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>Current resources, applications, and procedures are periodically assessed or altered with the intent to promote continuous improvement. (e.g. an upgrade to the latest NT Administration tools.)</i>	
Process Change	GP 5.1: Deploy “best practices” across the organization	<i>Process improvements implemented in GP5.1 are validated via collected metrics and defined strategic drivers. (e.g. As in the example above the upgrade to the latest NT tools would be tested, rolled-out, and monitored to measure in business performance improvement.)</i>	

Process Area	2.4 Network Services
Questions	
Base Practice: 2.4.1 Populate Directories	
What is the process for adding first time directory information to new directories? Is there a different process for populating old directories? If so, please describe.	
How often does populating new directories occur and who approves this?	
How are directory permission properties defined and gathered?	
How often are directory permission properties surveyed and altered?	
Does the process of populating existing directories take various system needs into consideration? (E.g. Does directory population follow a convenient and logical schedule?)	
Base Practice: 2.4.2 Manage Directories	
Who is responsible for managing the network directories? What is the overall process for managing the directories?	
How is the directory content volume monitored and managed?	
How are the relationships between directories managed?	
How often is the interface between different directories updated?	
How is the content of different directories maintained?	
Do you have directories that require synchronization? What is the process for synchronizing the directories?	
Base Practice: 2.4.3 Determine Organizational Impacts	
Are organizational and business impacts taken into consideration when determining and designing various network services? (e.g. directory structure, permissions, etc.) If yes, how?	
What processes are in place to determine organizational impacts?	
Base Practice: 2.4.4 Extract Information from Directories	
What type of information do you gather or extract from directories (e.g. authentication information, access control profiles, etc.)?	
How do you store the information collected from directories?	
Are you creating reports from this data? If yes, what types of reports are you creating?	
Is anyone managing inconsistencies or flagging abnormalities? If yes, who and how are they flagging or correcting the abnormalities? Is their communication between the Network Services and Fault Management or Monitoring teams when sever abnormalities occur?	
Base Practice: 2.4.5 Identify Component Options	
What physical and logical components have you identified in your environment? How did you determine what components were needed for your environment?	
Is there a process for categorizing different network components? Are different people responsible for the different types of components? If yes, who are they and do they just receive training on the specific component types they are responsible for?	
Base Practice: 2.4.6 Document Strategic Drivers (e.g. geography, security, etc.)	
What are some of the strategic drivers identified for providing the optimum network services? Is there an order of importance for the strategic drivers you have identified? If yes, please elaborate.	
Are your strategic drivers documented? Are they revisited when a business or organizational change happens? How are they kept in line with the business or organizational needs?	
Base Practice: 2.4.7 Outline Guiding Principles for Communication Address Planning	
Do you have any guiding principles in place that allow the address team to develop and share a common vision for all addressing functions? If yes, what are some of these guiding principles?	
Are there common processes and practices across several of your networking functions? If yes, which ones?	
Is there a lot of cross functionality between your network groups? If yes, please explain the cross functionality?	
Base Practice: 2.4.3 Address and Domain Maintenance	
How often is address maintenance performed? What processes are used for the addition, deletion, maintenance, and modification of addresses?	

How often is domain maintenance performed? What processes are used for the addition, deletion, maintenance, and modification of domains?
How are the address tables maintained?
What is the process for maintaining DNS?
Base Practice: 2.4.5 Address Design Process
1. Are address design and technical network diagrams created? Are they updated? If so, how often?
2. Are conflicts or network issues taken into consideration when the address system is being designed? If yes, what conflicts or issues are considered and how are the network solutions modified? Is there a process to follow for making changes?
Base Practice: 2.4.6 IP Technology Research Process
How often is emerging technology considered and evaluated for the current network?
Are there defined processes that determine whether a new technology would enhance or improve the current network system? If so, what are they?
If a new technology is being considered what type of testing or research is done to ensure that the technology meets the business needs?
Generic Questions for Process Area
1. Are training classes provided and do all new Network Services personnel attend training on the defined Directory Maintenance and Communication Address Planning processes? If so what type of training ensures adequate execution of these established directory management and address servicing procedures?
2. Are current resources and procedures periodically assessed with the intent to promote continuous improvement? What is the approval process for proposed solutions? Are all potential stakeholders involved in the decision process? How often are these solutions implemented and by whom?
3. How are routine network services and continuous improvement solutions evaluated for impact?
4. Do you find that the resources allocated to network services is adequate? Please elaborate.

Process Capability Assessment Instrument

Process Area	2.4 Network Services
Process Area Description	<p>Network Services Process Area is comprised of the following two areas:</p> <p><i>Directory Services:</i> is the function of publishing and maintaining organized inventories of information resources to make them available to networked customers. Directory Management can apply to internal directories as well as the publishing of directory information for global directory services.</p> <p><i>DNS:</i> ensures that IP services are provided to devices within an enterprise. Whether dealing with a new or existing capability, the communications address management function demands that high-level business requirements be taken into consideration.</p>

5

Questionnaire

Process Area	2.4 Network Services
--------------	----------------------

10

		Yes	No	Don't Know	N/A
1	Is there a formalized process for populating new directories?				
2	Is maintenance of the directories performed on a regular basis?				
3	Is the organizational structure taken into consideration when creating the directory management structure?				
4	Is network directory information being collected? (e.g. authentication, configuration information, etc.)?				
5	Does a process exist which inventories the various network components (e.g. Physical and Logical Components)?				

6	Is general documentation of strategic drivers documented?				
7	Are network capacity guidelines outlined for the address plan?				
8	Are address and domain maintenance performed regularly?				
9	Do forecasts predicting future IP capacity needs exist?				
10	Is there a specific process documented and followed when creating business and technical requirements for Communications Address Management?				
11	Is there a review process for assessing and evaluating new emerging technologies for Communications Address Management and other Network Services Functions?				

Work Product list

5

Process Area	2.4 Network Services
--------------	----------------------

- Access Control Profiles
- Network Traffic Flow Diagrams
- IP Address Availability Report
- DHCP Address Lease Contracts
- IP Address Tables
- Copy of current documented Address Plan

10

15

Backup/Restore/Archiving (2.5)

PA Number	2.5
PA Name	Backup/Restore/Archiving
PA Purpose	Backup/Restore/Archive Management considers all of the back-ups and restorations that need to take place across a distributed system for master copies of data. Archiving saves and stores information across the distributed environment. These processes may occur centrally or in distributed locations.
PA's Base Practices	2.5.1 Test central/remote backup/restore/archival procedure periodically 2.5.2 File backup steps and considerations 2.5.3 File restoration steps and considerations 2.5.4 Compress and index information being archived 2.5.5 Notify that the backup/restoration/archival process has been completed successfully/failed 2.5.6 Perform housekeeping on the backup/archival library 2.5.7 Synchronize backups and restores
PA Goals	To establish islands of recovery/"firebreaks" in the logical data model to avoid having to restore all of the data in the database when only a portion of the database has failed To ensure that backups will be available beyond the previous day's processing To backup server and workstation data that is mission critical To perform backups and restorations with careful consideration to bandwidth, speed, data volumes, cross-platform dependencies and non transparent restores To have a solid plan for backups, restores, and archival for off-site data
PA's Metrics	% of successful backup/restoration/archival transactions per month How many low network time frame backups are performed weekly How many minutes it takes to respond to a failed backup server. # of routine backups done per week Mean time to restore data

Base Practices

BP Number	2.5.1
BP Name	Test central/remote backup/restore/archival procedure periodically
BP Description	Test initializing a central and remote backup, restore, and archival process to audit the entire system.
Example	Once a month test backing up and restoring a file, directory, or test machine. Then restore

	<i>the file, directory, or whole machine to verify the integrity of the data.</i>
BP Number	2.5.2
BP Name	File backup steps and considerations
BP Description	<p>Prepare system for backup processes</p> <p>Maintain service during backup and manage system non-availability</p> <p>Perform complete/incremental backups and archival of information centrally</p> <p>Perform complete/incremental backups and archival of information remotely</p> <p>Monitor backup/restoration/archival processes</p> <p>Verify the integrity of the backup media</p> <p>Provide audit trail of backup processes</p>
Example	<i>The backup scheme is based on a seven-day weekly schedule. Full-backup of all the volumes occurs on Friday, and differential backup based on the archive bit occurs on each of the other days. Backups occur at night and in the morning regular inspection of all the backup operations is performed and the backup reports are filed in appropriate folders. The backup tapes are labeled properly to ensure the correct tape is in the tape drive for each day of the week.</i>
BP Number	2.5.3
BP Name	File restoration steps and considerations
BP Description	<p>Prepare system for restoration processes</p> <p>Restore single/multiple objects from the backup media</p> <p>Restore complete/incremental backup/archival centrally</p> <p>Restore complete/incremental backup/archival remotely</p> <p>Monitor restoration processes</p> <p>Roll forward from the journal after a restore (i.e., update with current information)</p> <p>Validate integrity and consistency of restored information</p>
Example	<i>Customers are advised that backup/restore provisions are made primarily to handle disasters rather than for restoring files accidentally deleted or overwritten. However, special requests for restoring individual files are processed through the Service Desk with prior approval. After analyzing the request, the correct tape is determined and the corresponding directory/files are restored. If necessary, changes are applied from the journal to the restored copy of data.</i>
BP Number	2.5.4
BP Name	Compress and Index information being archived
BP Description	Data should be compressed and indexed for storage. Compression will reduce the amount of disk space needed to store the data. Indexing will allow for a "table of contents" to be created on the information stored, which will make it faster to access the data, if ever needed.
Example	<i>Data is stored in a compressed format and is indexed for future reference. Reports are prepared linking index references to information regarding the date, time, and description of content of each backup.</i>
BP Number	2.5.5
BP Name	Notify that the backup/restoration/archival process has been completed successfully/failed
BP Description	Event Notification. Verify that any backup/restore/archival notifications are integrated with alerts or status notifications from the network management system
Example	<i>Page support personnel via HP OpenView/Netview when backup server fails or generate an e-mail to support personnel if notification does not have to be immediate.</i>
BP Number	2.5.6
BP Name	Perform housekeeping/maintenance on the backup/archival library
BP Description	<p>Label backup media</p> <p>Store copies of backups in a vault/off-site</p> <p>Maintain the backup/archive library</p> <p>Perform generation maintenance tasks for archival</p>
Example	<i>Label backup media with date, type of data being stored, machine the data came from, and whether the backup is incremental or full. Ensure that media is stored offsite or in a library safe from environmental changes that could damage the media.</i>
BP Number	2.5.7
BP Name	Synchronize backups and restores
BP Description	Schedule backups and restores so they do not interfere with other batch jobs, backups/restores, or production activities.

Example	<i>Backups can be scheduled and performed during low network traffic times. Begin an incremental backup at 1:00am and confirming that the backup is completed before network traffic picks up in the morning, or doing complete backups on weekends when the network traffic is low.</i>
----------------	--

References

	MODE v2
	MODE v1 Toolkit

5 Process Area: Backup/Restore/Archiving
 Level 1
 Assessment Indicators: Process Performance
 Generic Practice: Ensure that Base practices are performed

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
2.5.1 Test central/remote backup/restore/archival procedure periodically	<i>Test plans are available for a monthly backup and restore test for a file, directory or test machine.</i>	
2.5.2 File backup steps and considerations	<i>A backup plan and schedule is avail. Backups occur during minimal use periods and the schedule gives priority to mission critical data.</i>	
2.5.3 File restoration steps and considerations	<i>Documented procedures for customers to request restoration of files are in place.</i>	
2.5.4 Compress and index information being archived	<i>Data is compressed and indexed for storage.</i>	
2.5.5 Notify that the backup/restoration/archival process has been completed successfully/failed	<i>Support personnel receive a page (via HP OpenView/Netview) when backup server fails or an email confirmation of a successful backup.</i>	
2.5.6 Perform housekeeping on the backup/archival library	<i>All archived tapes are adequately labeled for easy retrieval.</i>	
2.5.7 Synchronize backups and restores	<i>Backups are scheduled during low network traffic times.</i>	

10 Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>A documented policy is maintained, that describes the backup and archival plan and schedule. The SLA specifies the terms for restoration (e.g. time within which a requested file will be restored).</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>Adequate resources are allocated so that the backup/restore/archival process occurs according to plan and schedule.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>Personnel receive training on the backup/restore/archival tool and process.</i>	
	GP2.4 Collect data to measure performance	<i>Data such as the following are collected: percent of successful backup/restore/archive transactions per month, mean time to restore data, etc.</i>	

	GP2.5 Maintain communication among team members	<i>Backup/restore/archive personnel provide regular status reports to appropriate parties.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>Tapes are labeled according to specifications.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>Records are maintained of any updates made to backed-up/stored data, and any restorations performed.</i>	

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an organization level	<i>Channels exist (and customers are aware of them) for making restore requests.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>Planning for new backup/restore technologies includes projecting accompanying human resource needs.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>Backups occur in accordance with documented policies on frequency and type.</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>The backup/restore/archival team provides feedback on the process at periodic meetings.</i>	

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Quantitative targets for assessment metrics for the backup/restore/archival process are periodically set.</i>	
	GP4.2 Automate data collection	<i>The backup/restore tool automatically collects data needed for assessing the backup and restore processes.</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>All specified data for backup/restore/archival process evaluation is collected.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>Assessment metrics collected are compared to targets and discrepancies addressed.</i>	

5

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>The backup/restore/archival process and relevant technologies are periodically reviewed to identify potential enhancements or beneficial changes to the existing system. Actions are taken to implement the improvements identified.</i>	
Process Change	GP 5.1:Deploy “best practices”	<i>Policy documentation is updated to</i>	

	across the organization	<i>reflect any new/modified procedures and all appropriate parties within the organization receive notification.</i>	
--	-------------------------	--	--

Process Capability Assessment Instrument: Interview Guide

5

Process Area	2.5 Backup/Restore/Archiving
--------------	------------------------------

Questions
Base Practice: 2.5.1 Test Central/Remote Backup/Restore/Archival Procedure Periodically
What type of periodic testing of the backup/restore/archival procedures is performed?
Are both central and remote backup/restore/archiving tested?
How (in what format) and to whom are the testing results reported?
Have your tests typically been successful? What constitutes a successful test?
Base Practice: 2.5.2 File Backup Steps and Considerations
Have the backup requirements been defined and documented for the following items:
Customer, operations, applications responsibilities
Remote vs. central backups
Frequency of backups
Components to be backed up
What type of application or automated process is used for backup?
Are backup and restore processes managed centrally or remotely?
What type of backup (full, incremental, export) is performed and how often?
What media (tape, magnetic disc, cartridge etc.) is used for backup? Why was this medium chosen?
If the system is unavailable to customers during backups, how is system unavailability managed?
If parts of the system are down during a scheduled backup, is a manual backup performed when the system gets back online?
Where is backed-up/archived data stored? For what length of time is data stored?
Does the backup and restore process require manual intervention?
What type of monitoring of the backup process is performed?
Are backup records made? If yes, what information is documented?
Base Practice: 2.5.3 File Restoration Steps and Considerations
What events warrant a restoration and how is the process initiated? Are these policies documented?
Can customers submit requests for particular files to be restored? How are customer requests logged and tracked?
Can single/multiple objects be restored from the backup media?
Can a full/incremental backup be restored centrally and remotely?
What type of monitoring is done of the restoration process?
Are notification procedures in place to inform customers and service providers of success/failure of restoration?
Base Practice: 2.5.4 Compress and Index Information Being Archived
Is archiving triggered automatically or must it be manually initiated?
How is data compressed and indexed prior to being archived?
Base Practice: 2.5.5 Notify that Backup/Restoration/Archival Process has been Completed Successfully/Failed
Who receives notification of the outcome of the backup/restore/archival process?
How is this notification sent?
What action, if any, is taken on receipt of the notification?
Base Practice: 2.5.6 Perform Housekeeping on the Backup/Archival Library
What maintenance tasks are performed on the backup/archival library? Who is responsible for maintaining the library?
Is storage media labeled? What information is recorded on the label? Does labeling follow documented specifications?
How many copies of backup data are made, and how many generations are maintained? Are copies stored in different locations?
How is integrity of stored and retrieved files ensured (e.g. resurrecting relationships)?
Base Practice: 2.5.7 Synchronize Backups and Restores

Does a predefined schedule for regular backups and restores exist? If so, when do backups and restores occur?
What is the process for scheduling a backup/restore not regularly planned? Who manages this process?
Are there any indicators in the application that can help signal when a backup is needed if it does not fall on one of the scheduled backup times?
Generic Questions for Process Area
Are any quantitative targets set with regard to the backup/restore/archive process (e.g. % of successful backups per month)? If so, what are they? Are these targets achieved? How frequently are they evaluated?
Is the backup/restore/archive process periodically reviewed and new technologies evaluated with the purpose of identifying potential improvements? How frequently does this occur?
Do you find that adequate resources are allocated to managing the backup/restore/archive process?
What type of training do backup/restore/archive personnel receive?

Process Capability Assessment Instrument

Process Area	2.5 Backup/Restore/Archiving
Process Area Description	Backup/Restore/Archive Management considers all of the back-ups and restorations that need to take place across a distributed system for master copies of data. Archiving saves and stores information across the distributed environment. These processes may occur centrally or in distributed locations.

5

Questionnaire

Process Area	2.5 Backup/Restore/Archiving
--------------	------------------------------

10

		Yes	No	Don't Know	N/A
1	Is the backup/restore/archival procedure periodically tested?				
2	Are backups/restores performed both centrally and remotely?				
3	Are backup/restore processes monitored?				
4	Is an audit trail of backup/restore processes created?				
5	Is the integrity and accuracy of backed-up/restored data ensured?				
6	Are data compressed and indexed before being stored?				
7	Do appropriate personnel receive notification of success/failure of backup/restore/archival process?				
8	Are general maintenance and housekeeping tasks performed for the backup/archival library?				
9	Are backup and restores scheduled so that they do not interfere with other batch jobs or production activities?				

Work Product list

Process Area	2.5 Backup/Restore/Archiving
--------------	------------------------------

15

- Backup requirements document
- Sample backup log
- Document outlining schedule of backups (e.g. full, incremental, differential)
- SLA outlining backup and restore agreements

20

Monitoring (2.6)

PA Number	2.6
PA Name	Monitoring

<p>PA Purpose</p>	<p>Monitoring verifies that the system is continually functioning in accordance with defined operational thresholds. Monitoring consists of the following functions:</p> <p>Event Management: receives, logs, classifies and presents event messages on a console(s) based on pre-established filters or thresholds. Event information is sent from such components as: hardware, applications/system software, communications resources, etc. If an event is classified as “negative” (i.e., a fault), event management forwards the event on to fault management for diagnosis and correction.</p> <p>Fault Management: a negative event has been brought to the attention of the system, actions are undertaken within Fault Management to define, diagnose and correct the fault. This includes processes to notify the correct technical support team and escalate as necessary. Although it may be possible to automate this process, human intervention may be required to perform at least some of these management tasks.</p>
<p>PA’s Base Practices</p>	<p>Event/Fault Management: Poll for current status, if necessary (this may negatively impact performance) Gather and document monitoring information Classify events/Assign severity levels/Assess impact Analyze faults Route faults to be corrected Map event types to pre-defined diagnostic and/or corrective procedures Log events locally and/or remotely Suppress duplicated/informational messages until thresholds are reached Display status information on console(s) in multiple formats Display status information in multiple locations Issue commands on remote processors/hosts Set up and change local and/or remote filters Set up and change local and/or remote threshold schemes Analyze traffic patterns Send broadcast messages</p>
<p>PA Goals</p>	<p>Event Management: To provide for network service assurance. To quantify the level of service delivery provided. Fault Management: To provide proactive response to network and platform problems.</p>
<p>PA’s Metrics</p>	<p>Event Management: Average amount of time that an application is available # of duplicate/informational messages per month Fault Management: Average response time to network outages and issues % of troubles isolated correctly Mean time to recover/repair critical systems</p>

Base Practices

<p>BP Number</p>	<p>2.6.1</p>
<p>BP Name</p>	<p>Poll for current status</p>
<p>BP Description</p>	<p>If necessary, gather information on the current status of the distributed environment. This may negatively impact performance, based upon polling cycle.</p>
<p>Example</p>	<p><i>This information could be gathered through SNMP gets, pings, or management agents.</i></p>
<p>BP Number</p>	<p>2.6.2</p>
<p>BP Name</p>	<p>Gather and document monitoring information</p>
<p>BP Description</p>	<p>Receive information from element management systems Receive information from components in distributed system Reformat information to a standard message type</p>
<p>Example</p>	<p><i>Ping, service, and process data should be recorded in a standard log or database for tracking purposes.</i></p>
<p>BP Number</p>	<p>2.6.3</p>
<p>BP Name</p>	<p>Classify events/Assign severity levels/Assess impact</p>
<p>BP Description</p>	<p>Once the data or event is pulled in, the event is defined or classified. A severity level and</p>

	system impact is determined.
Example	<i>Events can be classified as informational messages, faults, etc.</i>
BP Number	2.6.4
BP Name	Analyze Faults
BP Description	Analyze any faults to identify whether it originates with a specific device or whether an entire segment is affected. If applicable, correlate events from multiple devices to assist in problem analysis.
Example	<i>If all the devices on an entire network segment are generating an alarm there may be a problem with a primary router or link. Find the common connection point of the faulty segment to the network by viewing the high-level network topology map. Drill-down to progressively more detailed location maps to pinpoint the problematic node.</i>
BP Number	2.6.5
BP Name	Route faults to be corrected
BP Description	Ensure that a fault is routed to an entity that can correct the problem.
Example	<i>A fault or event routed to an automated process or application such as BMC Patrol to restart a process or service.</i>
BP Number	2.6.6
BP Name	Map event types to pre-defined diagnostic and/or corrective procedures
BP Description	Define event types and provide proactive procedures for correcting any problems encountered.
Example	<i>As thresholds can be set, event types can be set to trigger a proactive response. If a service such as DNS fails an event type can be set to send information to an application such as BMC Patrol to restart the DNS service.</i>
BP Number	2.6.7
BP Name	Log events locally and/or remotely
BP Description	Record events/faults and make log or event database accessible to local and remote sights for troubleshooting purposes.
Example	<i>If a lot of data is being collected, and there is a need to report on the data, it may be best for the data to be converted from log files, or flat files, to a database format for creation of reports and graphs.</i>
BP Number	2.6.8
BP Name	Suppress duplicated/informational messages until thresholds are reached
BP Description	Duplicate/informational messages may clog up the log files with unnecessary messages making the log laborious to read. By only creating messages when thresholds are met operations staff can proactively assess and take action on the monitored system that has reached its' threshold.
Example	<i>An application with a rules based correlation engine such as NerveCenter can filter through and clean up any duplicate messages that may clog up the log files before it is passed to the log file or database. Other correlation engines are part of product suites from Tivoli, CA and HP Openview.</i>
BP Number	2.6.9
BP Name	Display status information on console(s) in multiple formats
BP Description	Immediate network status can be done by collecting ping and SNMP data, which is then displayed in log format, maps, and graphs.
Example	<i>HP Openview has maps which show the critical level of each device being monitored, and creates a log of the devices at the same time. If a server is down it will appear red on the map.</i>
BP Number	2.6.10
BP Name	Display status information in multiple locations
BP Description	In a distributed environment groups/people outside the operations staff may need to be aware of the environments status.
Example	<i>Help Desk notified of server being down so they can respond to calls appropriately</i>
BP Number	2.6.11
BP Name	Issue commands on remote processors/hosts
BP Description	Connect to a remote site and run/issue commands to processors/hosts at the remote location.
Example	<i>Issuing of a command can be initiated by a person or by an application such as BMC Patrol to restart a process, service, etc.</i>
BP Number	2.6.12

BP Name	Set up and change local and/or remote filters
BP Description	Configure router filters to allow or deny specific protocols and stations access to a distributed environment.
Example	<i>If you are monitoring several sites it may be necessary to make changes to firewalls and routers between the sites so SNMP, MIB, process, service, and other network information can pass through to be gathered, logged, and reported upon. This may include opening up IP ports for pass through.</i>
BP Number	2.6.13
BP Name	Set up and change local and/or remote threshold schemes
BP Description	Measure and determine the thresholds for each managed end point monitored for performance for both local and remote sites. Ensure that these thresholds meet SLAs. Advanced systems will support the concept of global thresholds, group or profile thresholds, and local thresholds.
Example	<i>When starting to monitor a network you will want to gather as much information on the network as you can. As you begin to see the trends you will want to define thresholds so that you are not inundated with information.</i>
BP Number	2.6.14
BP Name	Analyze traffic patterns
BP Description	Gather information on protocols and stations communicating on a network segment. Some autodiscovery configuration and monitoring can be supported.
Example	<i>Look for errors, misrouted traffic, thresholds, bandwidth, repetitious data patterns, protocols used on the network segment, etc.</i>
BP Number	2.6.15
BP Name	Send broadcast messages
BP Description	Send message to be received by all nodes in a distributed environment.
Example	<i>When a server needs to be rebooted due to a service or process failing send a broadcast message to all that may be connected so they can save their data and log off the machine.</i>

References

	MODE v2
	MODE v1 Toolkit

Process Area: Monitoring

Level 1

5 *Assessment Indicators:* Process Performance

Generic Practice: Ensure that Base practices are performed

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
2.6.1 Poll for current status, if necessary	<i>SNMP commands are used to gather information on the distributed environment, when necessary. Example of output of such a polling is available.</i>	
2.6.2 Gather and document monitoring information	<i>Standard log shows the event and fault information gathered and recorded.</i>	
2.6.3 Classify events	<i>When questioned, personnel can explain the criteria under which events are categorized as informational, fault etc.</i>	
2.6.4 Analyze faults	<i>Example of the results of a preliminary analysis that occurred to identify the extent/scope of a fault.</i>	
2.6.5 Route faults to be corrected	<i>Faults are routed to appropriate resource for handling. Personnel can explain the policy on where and how particular faults should be routed.</i>	
2.6.6 Map event types to pre-defined procedures	<i>Where possible, proactive procedures are predefined and triggered for particular events.</i>	
2.6.7 Log events locally and/or remotely	<i>Event/fault logs are accessible both locally and remotely.</i>	
2.6.8 Suppress duplicated/informational messages	<i>Duplicate/informational messages are suppressed until predefined thresholds are reached. Example of log shows that duplicate</i>	

until thresholds are reached	<i>messages are not recorded.</i>	
2.6.9 Display status information on console(s) in multiple formats	<i>Graphs, maps and logs are available to show status information.</i>	
2.6.10 Display status information in multiple locations	<i>Status information is conveyed to Service Desk and other relevant parties. When questioned, personnel can describe who is informed and the procedure for doing so.</i>	
2.6.11 Issue commands on remote processors/hosts	<i>Commands can be issued on remote processors/hosts.</i>	
2.6.12 Set up and change local and/or remote filters	<i>Router filters are in place to control access.</i>	
2.6.13 Set up and change local and/or remote threshold schemes	<i>Thresholds have been specified for critical nodes and documentation of the thresholds is available..</i>	
2.6.14 Analyze traffic patterns	<i>Traffic information is reviewed to detect errors, misrouted traffic, thresholds, bandwidth, repetitious data patterns etc.</i>	
2.6.15 Send broadcast messages	<i>Broadcast messages are sent when necessary.</i>	

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>Documentation is maintained of all necessary monitoring activities to be performed.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>A monitoring tool is employed that is appropriate for the breadth and complexity of the distributed environment.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>Qualified staff are assigned to performing the monitoring tasks that require manual intervention (e.g. reviewing logs) New monitoring personnel receive training on the monitoring tool.</i>	
	GP2.4 Collect data to measure performance	<i>Metrics are collected, for example: average response time to network outages and issues, average time an application is available.</i>	
	GP2.5 Maintain communication among team members	<i>Issues are tracked and logged. Members of the monitoring team provide status reports to appropriate groups.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>Monitoring logs contain all required entries and information that are outlined in monitoring policy.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>Monitoring information from the various components of the distributed system are reformatted to a standard message type. Monitoring data is archived for future reference.</i>	

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an organization level	<i>The monitoring provides mechanisms to alert appropriate resources when a fault is detected.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals	<i>As the monitoring technology changes, monitoring personnel receive additional training that is needed.</i>	

	consistently and repeatedly		
Process Resource	GP3.3: Plan for human resources proactively	<i>Fault management occurs according to stated policies and procedures. (e.g. for every fault a ticket is logged, the problem is resolved within the SLA/OLA specifications, and ticket is updated with fault resolution.</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>The manager of the monitoring function solicits feedback from the monitoring team on processes involved with monitoring their business environment.</i>	

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Targets are regularly set for metrics assessing fault management. Actual measures are compared against these targets.</i>	
	GP4.2 Automate data collection	<i>System capabilities and thresholds have been identified and recorded.</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>The monitoring tool automatically collects the necessary data for the defined metrics.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>Appropriate steps are taken to address discrepancies between actual monitoring logs or monitoring data and the targets or thresholds set.</i>	

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>Monitoring software and process are periodically evaluated with the intent of identifying potential new technologies that may fit the needs of the business strategy better than the existing technologies..</i>	
Process Change	GP 5.1:Deploy “best practices” across the organization	<i>The same reporting procedures and requirements are met when implementing or evaluating a new technology.</i>	

5

Process Capability Assessment Instrument: Interview Guide

Process Area	2.6 Monitoring
--------------	----------------

Questions
Base Practice: 2.6.1 Poll for Current Status, if necessary
How is polling of the current status of the network done?
Does polling impact the performance of the network? If so, how?
Base Practice: 2.6.2 Gather and Document Monitoring Information
From what sources is monitoring information gathered (e.g. element management systems, network components)?
Has a document been created that specifies the type of information that should be collected for monitoring purposes? Are these specifications followed?
In what format is monitoring information stored?
Base Practice: 2.6.3 Classify events/Assign severity levels/Assess impact
How do you classify or define your events?

What system or applications do you used for gathering, defining, and classifying events?
How are severity levels and system impact determined?
Base Practice: 2.6.4 Analyze Faults
What type of preliminary analysis of a fault event occurs? Is the extent of the fault investigated? If so is this process automated?
Does your monitoring tool have the capability to correlate multiple events?
Can your tool provide a high level view and then enable “drilling down” to analyze a fault?
Base Practice: 2.6.5 Route Faults to be Corrected
How is routing of faults to the appropriate resource managed?
Are fault notifications anticipated due to other errors being received?
Is a determination of the customers/devices affected by the fault made and are those customers notified?
If a fault puts the system at risk, are appropriate resources (e.g. help desk) notified?
Once the fault is identified, are associated alarms suppressed?
Is fault handling tracked to ensure successful resolution? (e.g. trouble ticket logged)
Does a fault log exist, and is the appropriate level of documentation made? If so, please describe the information recorded.
Are fault statistics reported and managed? Are targets set for statistics relating to fault management and how well are these met?
Base Practice: 2.6.6 Map Event Types to Pre-defined Procedures
What types of events activate pre-defined resolution procedures?
How are these pre-defined procedures managed? How was the decision made of which events to set up with pre-defined solutions? How frequently is the collection of such events updated?
What mechanism is in place to check for successful execution of pre-defined procedures when necessary?
Base Practice: 2.6.7 Log Events Locally and/or Remotely
Where are event records stored?
For what time length is event data stored?
Who accesses the event log and for what purposes?
Base Practice: 2.6.8 Suppress Duplicated/informational Messages Until Thresholds are Reached
What mechanism checks for duplicated/informational messages and clears them from the event log unless a threshold is reached?
Base Practice: 2.6.9 Display Status Information on Console(s) in Multiple Formats
1. What types of current status information can be obtained?
In what formats can such status information be viewed (e.g. graph, map, log)?
Base Practice: 2.6.10 Display Status Information in Multiple Locations
In what locations is status information displayed?
Do personnel other than operations staff access this status information? If so who does and for what purposes?
Base Practice: 2.6.11 Issue Commands on Remote Processors/Hosts
What types of commands can be run on remote processors/hosts?
Can commands to remote processors/hosts be initiated both manually or by an application?
Base Practice: 2.6.12 Set up and Change Local and/or Remote Filters
For what types of purposes are router filters set up?
How frequently does the need arise for these filters to be changed?
What is the procedure for changing filters? Who manages this process?
Base Practice: 2.6.13 Set up and Change Local and/or Remote Threshold Schemes
How are thresholds determined for critical nodes?
Do these thresholds meet SLAs?
Under what circumstances are these thresholds changed?
What is the procedure for changing threshold schemes? Who controls this process?
Base Practice: 2.6.14 Analyze Traffic Patterns
What information about network traffic is collected?
What types of conclusions are sought in analyzing the traffic data? Are there predefined guidelines for the analysis that needs to be done?
Who performs this analysis and how frequently?
Base Practice: 2.6.15 Send Broadcast Messages
Are there provisions for sending broadcast messages?

What circumstances necessitate broadcast messages?
Who has the ability/responsibility for sending broadcast messages?
How frequently are broadcast messages sent?
Generic Questions for Process Area
What personnel are involved in the monitoring process? What roles to they play? What type of relevant qualification/training do they have?
Are personnel trained to decipher monitoring data, understand the processes involved in monitoring a distributed environment, and how to make changes to the monitoring system?
Are the monitoring software and process periodically evaluated with the intent of identifying potential improvements? Who facilitates this evaluation process?
Do you feel that adequate resources are allocated for monitoring purposes? Please elaborate.

Process Capability Assessment Instrument

Process Area	2.6 Monitoring
Process Area Description	<p>Monitoring verifies that the system is continually functioning in accordance with defined SLAs. Monitoring consists of the following functions:</p> <p>Event Management: receives, logs, classifies and presents event messages on a console(s) based on pre-established filters or thresholds. Event information is sent from such components as: hardware, applications/system software, communications resources, etc. If an event is classified as “negative” (i.e., a fault), event management forwards the event on to fault management for diagnosis and correction.</p> <p>Fault Management: a negative event has been brought to the attention of the system, actions are undertaken within Fault Management to define, diagnose and correct the fault. Although it may be possible to automate this process, human intervention may be required to perform at least some of these management tasks.</p>

5

Questionnaire

Process Area	2.6 Monitoring
--------------	----------------

		Yes	No	Don't Know	N/A
1	Is an application for monitoring the system's functioning used?				
2	Is information on the current status of the distributed environment collected?				
3	Is event information continuously gathered and recorded?				
4	Are events classified (e.g. faults, informational messages)?				
5	Is the extent of a fault determined?				
6	Are faults routed to the appropriate resource for correction?				
7	Do pre-defined corrective procedures exist that are automatically triggered when a particular event occurs?				
8	Are events recorded in a log accessible locally and remotely for troubleshooting purposes?				
9	To prevent clogging of log files, are duplicate or informational messages suppressed until thresholds are reached?				
10	Is current managed end point status displayed in multiple formats (e.g. log, map, graph)?				
11	Is current status information displayed in multiple locations (e.g. help desk)?				
12	Can commands be issued to remote processors/hosts?				
13	Are router filters in place and managed to control access to the network?				
14	Are threshold schemes that meet SLAs in place for local and remote nodes?				
15	Are network traffic patterns analyzed?				
16	Are broadcast messages sent to all nodes when necessary?				

10

Work Product list

Process Area	2.6 Monitoring
--------------	----------------

- 5 Sample of event log
- Network status map
- Reports on traffic patterns
- Reports on faults

10 **Performance Management (2.7)**

PA Number	2.7
PA Name	Performance Management
PA Purpose	Performance Management ensures that the required resources are available at all times throughout the distributed system to meet the agreed upon SLAs. This includes the monitoring and management of end-to-end performance based on utilization, capacity and overall performance statistics. If necessary, Performance Management can make adjustments to the production environments to either enhance performance or to rectify degraded performance (throttling).
PA's Base Practices	2.7.1. Monitor resource utilization/performance to ensure adequacy of resources Establish thresholds for each managed end-point Prioritize information and flag abnormalities Capture, save, summarize and collate necessary capacity statistics Create reports on utilization/capacity/performance Disseminate reports to appropriate parties Determine where performance requires short-term adjustments Isolate the cause of the performance problem
PA Goals	To have notifications sent from the applications/technical architecture utilization limits are reached. To provide performance information from applications in a consistent manner. To provide hooks to allow utilization/capacity/performance to be monitored from end-to end. To provide application transaction and/or nested transaction response time. This is done utilizing A.R.M. (application response measurement)
PA's Metrics	% of troubles isolated correctly % of bandwidth used Average response time to access applications Percentage of time that a server, router, hub, etc is available

Base Practices

BP Number	2.7.1
BP Name	Monitor resources utilization/performance to ensure adequacy of resources
BP Description	Monitoring is a function in a distributed environment that watches the workload of systems, applications, network, etc. in an operations organization.
Example	<i>Monitoring of servers, applications, processes, services, and other network devices will reveal areas that need to be expanded upon or modified to provide a high quality performance.</i>
BP Number	2.7.2
BP Name	Establish thresholds for each managed end-point
BP Description	Measure and determine the thresholds for each critical node monitored for performance. Ensure that these thresholds meet SLAs.
Example	<i>Setting thresholds for network devices such as CPU, router, application utilization, etc., will provide the operations team with information on the distributed environment that will allow them to be proactive and meet SLA with customers.</i>
BP Number	2.7.3
BP Name	Prioritize information and flag abnormalities
BP Description	Set levels for the thresholds and prioritize the performance statistics. Send signals when any statistic reach outside the levels and priorities set for that device's performance.
Example	<i>If a server reaches 70% capacity it may be protocol for a notification to be sent to the server</i>

	<i>team so they can plan on adding space, perform load balancing, etc. Thus being proactive and preventing a possible fault.</i>
BP Number	2.7.4
BP Name	Capture, save, summarize and collate necessary capacity statistics
BP Description	Collect ongoing statistics and prioritize the data for analysis.
Example	<i>Statistics are summarized according to some algorithm and then rolled up (averages, mean, etc.) and organized for trending reports. This data can be then passed on to the Capacity Modeling and Planning group for future forecasting.</i>
BP Number	2.7.5
BP Name	Create reports on utilization/capacity/performance
BP Description	Graph data to determine the utilization/capacity/performance of devices in the distributed environment you are monitoring.
Example	<i>As mentioned in the example above the trending data can be used to determine future business/capacity planning. It can also be used as an aide in the purchasing process of new hardware and software, or it can be used for load balancing.</i>
BP Number	2.7.6
BP Name	Disseminate reports to appropriate parties
BP Description	Reports should be distributed to appropriate people/groups.
Example	<i>Operations could receive a detailed daily report, and an executive would receive a high-level report highlighting only the problems encountered in the distributed environment.</i>
BP Number	2.7.7
BP Name	Determine where performance requires short-term adjustments
BP Description	Adjustments may need to be made when collecting performance data from devices that are taken down for repairs, upgrades, etc.
Example	<i>A server may be taken down on a weekend for maintenance. The monitoring system should be set up to ignore the machine until it is place back on line and is back in production. Gathering data on a machine that is purposefully taken down will skew the trending information and reports.</i>
BP Number	2.7.8
BP Name	Isolate the cause of the performance problem
BP Description	Gather and analyze data to determine the source of a performance problem.
Example	<i>An application on a server may appear to be having performance problem. Performance and capacity planning application such as BMC/BEST 1 and HP PerANALYZER/MEASUREMENT can gather the performance data and analyze the complete system revealing that the performance issue may be with the server capacity.</i>

References

	MODE v2
	MODE v1 Toolkit

Process Area: Performance Management

Level 1

5 Assessment Indicators: Process Performance

Generic Practice: Ensure that Base practices are performed

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
2.7.1 Monitor resource utilization/performance to ensure adequacy of resources	<i>A monitoring tool collects usage information that is evaluated to ensure system adequacy. When questioned, personnel can describe tools used to monitor resource utilization and performance.</i>	
2.7.2 Establish thresholds for each critical node	<i>Thresholds for each critical node have been determined and documentation of these thresholds are available.</i>	
2.7.3 Prioritize information and flag abnormalities	<i>When questioned, personnel can describe the signals that are sent when statistics near or cross threshold levels.</i>	
2.7.4 Capture, save,	<i>Performance statistics are collected on an ongoing basis.</i>	

summarize and collate necessary capacity statistics	<i>Personnel can provide examples of statistics collected, explain the statistics collected and reasons for collection.</i>	
2.7.5 Create reports on utilization/capacity/performance	<i>Example of utilization/capacity/performance reports.</i>	
2.7.6 Disseminate reports to appropriate parties	<i>Appropriate parties receive and review reports.</i>	
2.7.7 Determine where performance requires short-term adjustments	<i>Personnel can explain when short-term adjustments to performance data are deemed necessary and how they are made.</i>	
2.7.8 Isolate the cause of the performance problem	<i>Personnel can explain how performance data are analyzed to identify the source of a performance problem.</i>	

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>Documentation is maintained of all necessary performance monitoring activities to be performed.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>A performance monitoring tool is used that is appropriate for the breadth and complexity of the distributed environment.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>Qualified staff are assigned to analyze performance data to identify performance problems and isolate their causes. All performance management personnel have experience or training in analyzing performance data.</i>	
	GP2.4 Collect data to measure performance	<i>Metrics are collected, for example: percent of bandwidth used, percent of troubles isolated correctly.</i>	
	GP2.5 Maintain communication among team members	<i>Issues are tracked and logged. Members of the performance management team provide status reports to groups impacted by the network performance issues.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>Performance reports follow predefined specifications on content and format.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>Ensure that any new or updated format to performance reports adhere to the format and versioning as other reports.</i>	

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an organization level	<i>The system-monitoring tool tracks all critical events and generates logs. Personnel are able to review the logs to isolate performance problems.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>As the performance management technology changes, personnel receive additional training that is needed.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>Stated policies are followed in dealing with situations arising from thresholds being reached.</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>The manager of the performance management function solicits feedback from the team.</i>	

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Targets are regularly set for metrics assessing performance. Performance trending data can be utilized by the Capacity Modeling and Planning teams to aide in future capacity forecasting.</i>	
	GP4.2 Automate data collection	<i>System capabilities and thresholds have been identified and recorded.</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>The performance management tool automatically collects the appropriate data and generates reports based on defined reporting structures (i.e. defined x + y axes, type of graph etc.).</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>Appropriate steps are taken to address and correct any discrepancies between actual performance and the targets set.</i>	

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>New performance management technologies are evaluated and policies reviewed to identify potential improvements.</i>	
Process Change	GP 5.1: Deploy “best practices” across the organization	<i>The same procedures for setting, testing, and monitoring performance thresholds are followed in both remote and central locations.</i>	

5

Process Capability Assessment Instrument: Interview Guide

Process Area	2.7 Performance Management
--------------	----------------------------

Questions
Base Practice: 2.7.1 Monitor Resources Utilization/Performance to Ensure Adequacy of Resources
How are systems/applications/network workloads monitored to check for adequacy?
What condition qualifies a resource as inadequate, and what action occurs if an inadequacy is noted? Are these procedural policies documented?
Who is responsible for monitoring adequacy of resources?
How is trending data reported to the service provider for planning?
Base Practice: 2.7.2 Establish Thresholds for Each Critical Node
How are thresholds measured and determined for managed resources?
Do these thresholds meet SLAs?
Base Practice: 2.7.3 Prioritize Information and Flag Abnormalities
How is utilization monitored vis-à-vis thresholds?
As utilization is monitored, what types of abnormalities are flagged?
What is the procedure for handling abnormalities and who is responsible for ensuring that the necessary action occurs?
Base Practice: 2.7.4 Capture, Save, Summarize and Collate Necessary Capacity Statistics
Are capacity statistics collected on an on-going basis?
For how long is this capacity data saved?
What types of summary or trend reports on capacity are generated? How often?
Who reviews these reports and for what purposes?

Base Practice: 2.7.5 Create Reports on Utilization/Capacity/Performance
What types of reports on utilization/capacity/performance are generated?
Are guidelines for the format and contents of regular reports documented?
Base Practice: 2.7.6 Disseminate Reports to Appropriate Parties
1. Who receives the utilization/capacity/performance reports and for what purposes?
How frequently are these reports distributed?
Base Practice: 2.7.7 Determine Where Performance Requires Short-term Adjustments
Are adjustments to performance data made to account for down time related to repairs, upgrades, etc. (to ensure trending information is not skewed)? If so, in what situations are adjustments made?
Who decides on the appropriate adjustments, and on what basis?
Base Practice: 2.7.8 Isolate the Cause of the Performance Problem
Is system-wide data gathered and analyzed to identify the source of a performance problem? How is this data reported? Does any trending occur?
What is the mechanism or procedure by which the cause of a performance problem is isolated using system-wide data?
Generic Questions for Process Area
What personnel are involved in the Performance Management process? What roles do they play? What type of relevant qualification/training do they have?
Is a documented set of procedural policies followed in activities related to managing performance?
Are any data collected for use in assessing performance management? If so, please describe the information collected and any metrics that are computed. Are targets for the metrics set and performance evaluated against those targets?
Do you feel that adequate resources are allocated to performance management? Please elaborate.

Process Capability Assessment Instrument

Process Area	2.7 Performance Management
Process Area Description	Performance Management ensures that the required resources are available at all times throughout the distributed system to meet the agreed upon SLAs. This includes the monitoring and management of end-to-end performance based on utilization, capacity and overall performance statistics. If necessary, Performance Management can make adjustments to the production environments to either enhance performance or to rectify degraded performance.

5

Questionnaire

Process Area	2.7 Performance Management
--------------	----------------------------

		Yes	No	Don't Know	N/A
1	Is resource utilization and performance monitored to ensure adequacy?				
2	Are thresholds defined for each critical node?				
3	Are utilization and performance information prioritized so that abnormalities can be flagged?				
4	Are ongoing capacity statistics collected and analyzed?				
5	Are reports on utilization, capacity and performance generated?				
6	Are these reports disseminated to appropriate parties?				
7	Are short-term adjustments to performance statistics made when appropriate?				
8	Are performance data analyzed to isolate the cause of a performance problem?				

10

Work Product list

Process Area	2.7 Performance Management
--------------	----------------------------

Capacity reports
 Utilization reports
 Performance reports
 Document listing thresholds for managed resources

5

PA Number	2.8
PA Name	Security Planning & Management
PA Purpose	<p><i>Security Planning</i> initially involves defining the organization’s security policy and developing a security “plan of action”. An ongoing function of Security Planning is to evaluate the effectiveness of the existing security plan -particularly in the context of changing technologies - and plan for future security needs.</p> <p><i>Security Management</i> controls both physical and logical security for the distributed system. Due to the nature of a distributed environment, security may need to be managed centrally, remotely or through a combination of the two methods. Security Management also handles the logging of proper and illegal access, provides a way to audit security information, rectify security breaches and address unauthorized use of the system.</p>
PA’s Base Practices	<p><i>Security Planning</i></p> <ul style="list-style-type: none"> Define security objectives Develop security plan Obtain feedback & update security plan <p><i>Security Management</i></p> <ul style="list-style-type: none"> Establish security Receive information from Human Resources regarding employee comings and goings 2.8.6 Maintain accounts and Ids 2.8.7 Log security events 2.8.8 Check for viruses and clean up any found 2.8.9 Audit logs 2.8.10 Take corrective actions for security violations 2.8.11 Monitor security plan for its effectiveness
PA Goals	<p>To reduce the number of people with multiple IDs and passwords.</p> <p>To review security frequently to identify and resolve weaknesses.</p> <p>To provide security training and high-level support to gain customer acceptance of the security restrictions.</p>
PA’s Metrics	<ul style="list-style-type: none"> % of individuals with multiple IDs and passwords Number of security modifications made per month Number of security violations per month Mean number of accounts deleted and created per month

Base Practices

Security Planning	
BP Number	2.8.1
BP Name	Define security objectives
BP Description	A formal policy is developed that defines the organization’s security objectives and such as confidentiality, integrity, authenticity, non-repudiation etc. The security policy conveys the nature or tone of the company’s approach to security. The policy is approved and supported by management with a commitment to perform ongoing reviews and updates.
Example	<i>The development of a security policy entails an analysis that takes into account organizational goals, the cost of a potential violation (in terms of down time, lost revenue, lost trade secrets, etc.), the likelihood of attack (existence of competitors, accessibility of systems, etc.), and other relevant criteria. The security policy is periodically reviewed and updated to accommodate changing security objectives and new threats.</i>
BP Number	2.8.2
BP Name	Develop security plan and policies
BP Description	The defined security objectives are used as a basis for identifying security policies and actions. A security plan is detailed that specifies the actual tools or procedures that will support the security objectives. The plan also delineates the responsibilities of designated personnel (e.g. Security Administrator) and other employees.

Example	<i>After evaluating available technologies and the distributed environment's requirements, selections are made for firewall, encryption, authentication, virus protection, remote access and proactive evaluation tools. Security awareness programs' requirements and necessary compliance policies affecting staff/customers are specified.</i>
BP Number	2.8.3
BP Name	Obtain feedback & update security plan
BP Description	Feedback on the security plan is necessary to maintain a tight security process. Items that you should receive constant feedback on: Current performance of the security system (e.g. security monitoring reports produced by the security management function) New technologies that may compromise the security system Updates to the network that may compromise the security system New technologies that could improve the security of the distributed environment
Example	<i>Security objectives, policies and plans are periodically audited and updated for appropriateness. Changes to the distributed environment and new developments in the security arena (either new threats or new protection technologies) are taken into account.</i>
Security Management	
BP Number	2.8.4
BP Name	Establish security
BP Description	Implement logical and physical security controls, as specified by the security plan. Make customers aware of security policies, the importance of system security and their responsibilities in supporting security.
Example	<i>Software can be installed on the system to handle particular security issues, e.g. a firewall can address some threats raised by external connectivity. Physical security controls could include building access monitoring and policies to ensure laptop lock-down, if applicable. All customers receive a security awareness orientation that covers topics such as acceptable network use, the importance of selecting "unguessable" passwords, and physical security.</i>
BP Number	2.8.5
BP Name	Receive information from Human Resources regarding employee comings and goings
BP Description	Be in constant contact with HR to gather information on new employees coming into your distributed environment and for the employees leaving the environment. This will allow for creation of accounts and deletion of accounts in a timely manner.
Example	<i>Human Resources provides the system administrator(s) with information on new employees so that accounts and appropriate access can be set up. Notification of employee leaving is communicated so access can be disabled by the end of the day of departure.</i>
BP Number	2.8.6
BP Name	Maintain accounts and Ids
BP Description	Maintaining accounts entails: Maintain passwords Maintain customer profiles Maintain groups of customers Maintain supervisor profile Maintain resource profiles Disable customer ID after "N" failed attempts Expire customer ID after defined period of inactivity
Example	<i>Individual customer profiles and secure passwords are assigned to each authorized system customer, to enable tracking and reviewing of system activities.</i>
BP Number	2.8.7
BP Name	Log security events
BP Description	Keep logs of account names, times logged in, and duration that the account was accessed. Keep log of when security modifications are made and by whom.
Example	<i>Logs can monitor a virtual myriad of data, including access times, customer IDs, locations from where the system was accessed, actions the customer performed, and whether or not those actions were successfully completed. Logs should be searchable for known or suspected patterns of abuse, and should be protected from alteration by unauthorized personnel.</i>
BP Number	2.8.8
BP Name	Check for viruses and clean up any found
BP Description	Scan the hardware and software on a distributed environment and clean any viruses found with

	an anti-virus software package.
Example	<i>Identify and install an anti-virus product that best suits the network architecture. Since new viruses are constantly being created and discovered, the product should incorporate periodic updating.</i>
BP Number	2.8.9
BP Name	Audit logs
BP Description	Monitor logs on a consistent basis. This will allow for immediate corrective actions if a breach of security occurs.
Example	<i>Automated monitoring and alerting is employed to notify appropriate personnel when certain pre-defined events occur. For example, an email message is sent if a log fills up, an icon on a system administrator's screen flashes if someone's customer ID is disabled, or a network administrator is paged if a link to the ISP goes down. Logs are periodically scanned to identify any security events not covered by the automated system.</i>
BP Number	2.8.10
BP Name	Take corrective actions for security violations
BP Description	Listed are some steps to taking corrective actions for security violations: Escalate security violations Handle security violation off-line Report on security violations Disseminate reports to appropriate parties
Example	<i>A set of guidelines is maintained of procedures to follow in the event of a security violation. Appropriate response teams, as specified by the guidelines, are contacted to deal with a security violation.</i>
PB Number	2.8.11
PB Name	Monitor security plan for its effectiveness
PB Description	Test security plans periodically, monitor logs, and test the limits of your security system. (i.e. attempt to hack the system) Report test results to appropriate parties (e.g. security planning).
Example	<i>Security violation data is periodically reviewed to assess whether security objectives are being met or whether a modification of the security plan is needed. In testing the system, "hacker" tools, like password crackers, are run to attempt to break through security barriers.</i>

References

	"Network Security Best Practice" Alfred G. Leach @Andersen Consulting, 1997,1998.
	"Security Implications of Net-Centric Computing Sharon K. Dietz @Andersen Consulting, 1997, 1998.
	MODE v2
	MODE v1 Toolkit

Process Area: Security Planning & Management

Level 1

Assessment Indicators: Process Performance

Generic Practice: Ensure that Base practices are performed

5

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
2.8.1 Define security objectives and policies	<i>A formal policy that describes the organization's security objectives, security approach and security actions exists.</i>	
2.8.2 Develop security plan	<i>A plan is available that specifies all security measures to be implemented.</i>	
2.8.3 Obtain feedback & update security plan	<i>Documentation shows that new technologies (both security threatening and enhancing) are periodically evaluated to assess impact on existing system.</i>	
2.8.4 Establish security	<i>A variety of logical and physical security controls are in place (e.g. firewall, authentication mechanisms, encryption systems, security awareness programs etc.)</i>	
2.8.5 Receive information from Human Resources regarding employee	<i>A direct channel between HR and the systems administrator exists, and employee arrival/departure</i>	

comings and goings	<i>information is received in a timely manner.</i>	
2.8.6 Maintain accounts and Ids	<i>Authorized system customers receive individual customer profiles and confidential passwords.</i>	
2.8.7 Log security events	<i>Data such as access times, customer Ids, actions performed etc. are logged for monitoring purposes.</i>	
2.8.8 Check for viruses and clean up any found	<i>An anti-virus product is installed and periodically updated.</i>	
2.8.9 Audit logs	<i>Security logs are reviewed to detect any questionable activity.</i>	
2.8.10 Take corrective actions for security violations	<i>A set of procedures, including contact persons and appropriate steps, are detailed for dealing with security violations.</i>	
2.8.11 Monitor security plan for its effectiveness	<i>The security plans and data are periodically evaluated to ascertain effectiveness of security measures.</i>	

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>A policy outlining all security actions to be taken and responsibilities of staff and security management personnel exists.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>Sufficient resources are allocated to security planning so that all planned actions can be implemented.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>All security management personnel receive training on the policy, procedures and technologies associated with security management.</i>	
	GP2.4 Collect data to measure performance	<i>Data such as the following are collected: percent of individuals with multiple Ids and passwords, number of security violations per month.</i>	
	GP2.5 Maintain communication among team members	<i>Security issues are tracked and logged. Appropriate parties are informed of security violations.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>All specified security events and information are logged.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>All workstations receive the most recent version of the anti-virus product.</i>	

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an organization level	<i>Security management personnel consistently handle security violations or issues according to documented policies and procedures.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>Security management provides reports and meets with the security function to discuss security issues and effectiveness of security program.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>All customers are aware of their responsibilities in supporting security and the procedures/channels for reporting security violations or concerns.</i>	

	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>Training on new technologies is planned and provided for security management personnel. Security planning projects future human resource needs.</i>	
--	---	--	--

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Targets are set for metrics assessing effectiveness of security programs. For example a target ceiling for number of security violations per month is established.</i>	
	GP4.2 Automate data collection	<i>A tool is used for automatically collecting security events, logging them and providing summary statistics.</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>Sufficient resources are provided so that all specified metrics for assessing security management is collected.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>Actual security management metrics are compared to targets or goal set and discrepancies are addressed.</i>	

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>Periodic meetings are held to review new technologies and the security management programs in order to identify and plan for potential improvements.</i>	
Process Change	GP 5.1: Deploy “best practices” across the organization	<i>All system customers receive a security awareness orientation that emphasizes the importance of their role in supporting security. Topics such as periodically changing passwords, not giving passwords out on the phone, and physical site security are covered.</i>	

5

Process Capability Assessment Instrument: Interview Guide

Process Area	2.8 Security Management & Planning
--------------	------------------------------------

Questions
Base Practice: 2.8.1 Define Security Objectives
What types of issues are covered by the formal security policy?
Was the security policy submitted to management for approval?
Is the security policy documented and available to customers and management?
Base Practice: 2.8.2 Develop security plan and policies
Please describe the contents of the security plan?
What was the process for creating the security plan and policies?
Who is involved in the creation of the security plan/policies and who views the completed document?
Base Practice: 2.8.3 Obtain feedback & update security plan
What is the procedure by which new factors that affect the system’s security are determined and incorporated into security planning?
Who is responsible for identifying and monitoring factors that might necessitate changes to the current security plan?
How does the security planning function receive information on planned changes to the distributed environment? Who is responsible for communicating such information?

How are developments of new technology (that threatens or enhances security) tracked and taken into consideration for security planning?
Base Practice: 2.8.4 Establish Security
List all security software (encryption, authentication, virus protection, remote access, proactive evaluation etc.) that currently protects your system?
What other types of security measures have been implemented?
How are customers informed of the importance of network security and their responsibilities in supporting security?
Base Practice: 2.8.3 Receive Information from Human Resources Regarding Employee Comings and Goings
How is information on employee comings and goings communicated by Human Resources?
How long after an employee's departure is the account disabled?
Who is responsible for creating and deleting accounts?
Base Practice: 2.8.4 Maintain Accounts and Ids
Who is responsible for maintaining accounts, passwords and IDs?
Are customer, supervisor and resource profiles maintained?
Do any shared login ids exist on the system? If so, for what purposes?
Does a default "guest" login ID exist on the system? If so, for what purpose and how are access rights controlled?
Are there any specifications for valid customer passwords, such as minimum length, character combinations etc.?
How frequently are customers required to change their passwords? Are customers required to change their password after an administrative reset (e.g. customer forgets password)?
Are customer accounts locked out when consecutive failed logins occur? If yes, how many failed login attempts cause a lock-out? How long is the account locked before it is reset automatically?
Are customer accounts disabled when they are inactive for a set period of time? If so, what is this time period?
Base Practice: 2.8.5 Log Security Events
What types of event information are logged for security monitoring purposes?
Where are these logs stored and for what time period?
Who has access to the security event logs and for what purposes?
How are log records protected from alteration by unauthorized personnel?
Base Practice: 2.8.6 Check for Viruses and Clean up any Found
What forms of virus protection does your system have?
Are viruses checked for only when a virus scan is explicitly ordered by the customer, or does the virus checker implicitly monitor all file accesses? If the former is the case, is there a mechanism to ensure customers routinely run virus scans?
How frequently are updates to the anti-virus product received?
Base Practice: 2.8.7 Audit Logs
Is the security log monitoring process automated? If so, what types of events generate alerts?
Are the logs reviewed regularly for abnormalities that might not be automatically flagged?
What types of summary reports are created from the log information? Who receives these reports and for what purposes?
Base Practice: 2.8.8 Take Corrective Actions for Security Violations
What is the procedure for dealing with security violations? Are these procedural guidelines documented and viewed by security personnel?
Are security violations handled off-line?
When are security violations escalated and what is the process for doing so? Are escalation policies documented?
What types of reports are generated on security violations? Who reviews these reports and for what purposes?
Base Practice: 2.8.9 Monitor Security Plan for its Effectiveness
At time of security plan creation, were any means for judging plan effectiveness specified? If so, what are these methods, and are they routinely employed?
How frequently are security data reviewed to assess effectiveness of security plan? Who is responsible for performing these reviews?
Are any quantitative targets related to security set? Are these typically met? If they are not met, what is done?
What types of explicit testing (e.g. running hacker tools) of the system's security are performed?

How frequently?
Generic Questions for Process Area
Do you find that adequate resources are devoted to planning, implementing and monitoring system security?
Are security policies and procedures documented and communicated to appropriate personnel?
What type of training do security personnel receive?

Process Capability Assessment Instrument

Process Area	2.8 Security Planning & Management
Process Area Description	<p><i>Security Planning</i> initially involves defining the organization’s security policy and developing a security “plan of action”. An ongoing function of Security Planning is to evaluate the effectiveness of the existing security plan –particularly in the context of changing technologies - and plan for future security needs.</p> <p><i>Security Management</i> controls both physical and logical security for the distributed system. Due to the nature of a distributed environment, security may need to be managed centrally, remotely or through a combination of the two methods. Security Management also handles the logging of proper and illegal access, provides a way to audit security information, rectify security breaches and address unauthorized use of the system.</p>

5

Process Capability Assessment Instrument: Questionnaire

Process Area	2.8 Security Planning & Management
--------------	------------------------------------

10

		Yes	No	Don't Know	N/A
1	Has a formal security policy been defined and approved by management?				
2	Has a security plan been documented?				
3	Is the security plan periodically reviewed to ensure ongoing appropriateness in the face of changes to the environment and security threats?				
4	Are security mechanisms in place to protect the distributed system?				
5	Are all customers made aware of their role in supporting security?				
6	Is information on new/departing employees necessary for creating/disabling accounts communicated in a timely manner?				
7	Are customer accounts and IDs maintained?				
8	Are access events (i.e. account name, time logged in, duration of access) logged?				
9	Are virus checks and eradication periodically performed?				
10	Are security logs monitored and action taken if a security breach is detected?				
11	If a security violation occurs, are the appropriate corrective actions taken?				
12	Is the effectiveness of the security plan periodically tested?				

Process Capability Assessment Instrument:
Work Product list

15

Process Area	2.8 Security Planning & Management
--------------	------------------------------------

- Security policy document
- Security plans and procedures document
- Sample of security log
- Security violations reports
- Report on any tests of the security system

20

Physical Site Planning & Management (2.9)

PA Number	2.9
PA Name	Physical Site Planning & Management
PA Purpose	Physical Site Management monitors the central and distributed sites' environment to ensure environments are being controlled properly according to environmental and regulatory levels. When necessary corrective actions are issued and monitored according to pre-defined environmental control plans.
PA's Base Practices	<p>Planning</p> <p>Determine the physical site needs</p> <p>Management</p> <p>Test environmental/regulatory control plans periodically on a per-site basis</p> <p>Notify appropriate party of environmental failure on a per-site basis</p> <p>Monitor progress of corrective actions to failure on a per-site basis</p> <p>Monitor physical site management plan for its effectiveness on a per-site basis</p> <p>Provide feedback on physical site management to physical site planning function</p>
PA Goals	<p>Provide the service provider with an environmentally sound site/s where computer equipment can function within optimal operating parameters.</p> <p>Prepare a plan to test and monitor each site for compliance with environmental controls and regulatory measures.</p>
PA's Metrics	<p>Average monthly temperature of heating/air conditioning units per site</p> <p>Number of times per month temperature exceeds optimal at all sites</p> <p>Time of day, reason and length of UPS usage per month at all sites</p> <p>Monthly count of alarm activation's per site/reason</p>

Base Practices

Planning	
BP Number	2.9.0
BP Name	Determine the physical site needs
BP Description	Business requirements, strategies and functions are considered for each physical site to address the existing needs and future plans.
Example	<i>Planning may involve construction/development of a site expansion to address growth estimates of 20% for the next fiscal year.</i>
Management	
BP Number	2.9.1
BP Name	Test environmental/regulatory control plans periodically on a per-site basis
BP Description	The purpose of this activity is to confirm physical site management's readiness and compliance to procedures on all sites via testing of environmental and regulatory parameters.
Example	<i>Testing completed on switch over from utility to generator on all sites should be 6 seconds or less with the UPS in the mean time taking on the full load.</i>
BP Number	2.9.2
BP Name	Notify appropriate part of environmental failure on a per-site basis
BP Description	This task is intended to signal the respective dependent computer systems and customers of a sites environmental failure.
Example	<i>Banner message to system administrator should notify her/him of a 5 degree Celsius change within a computer room and possible a/c malfunction.</i>
BP Number	2.9.3
BP Name	Monitor progress of corrective actions to failure on a per-site basis
BP Description	The purpose of this practice is to oversee and monitor all corrective actions so that future failures can be adverted and/or prevented on sites.
Example	<i>Monitor the replacement of an unsatisfactory UPS with a new unit to handle increased load and track subsequent usage.</i>
BP Number	2.9.4
BP Name	Monitor physical site management plan for its effectiveness on a per-site basis
BP Description	The physical site management plan should be monitored to allow for changes in any of the site requirements and/or decreased efficiencies.
Example	<i>Monitoring shows that new computer room on a remote site, which has been re-designed with larger aisles making it easier for technicians to installs/de-install servers and run cables, proves more efficient.</i>
BP Number	2.9.5

BP Name	Provide feedback on physical site management to physical site planning function
BP Description	Feedback to physical site planning personnel allows knowledge gain from site management personnel and potential to incorporate changes or suggestions into future re-modeling or newly constructed computer sites.
Example	<i>Widening the aisles in Base Practice 2.9.4 above led to improvements on the site. The feedback to physical site planning from physical site management regarding the subsequent improvements may usher in new floor plans for other sites.</i>

References

	MODE Best Practices in Service Desk Practice Aid - Volume I
	MODE v2
	MODE v1 Toolkit
	Operations Architecture High Level Data Center Assessment – DataCenterHighLevelAssessment.doc

Process Area: Physical Site Planning & Management
Level 1

Assessment Indicators: Process Performance

Generic Practice: Ensure that Base practices are performed

5

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
2.9.0 Determine physical site needs	<i>The physical site plan considers hardware capacity/layout, emergency requirements, construction schedules. A cost/benefit analysis is performed prior to physical site plan finalization.</i>	
2.9.1 Test environment/regulatory control plans periodically on a per-site basis	<i>Test of smoke detectors within AC units should activate alarms and shutdown respective units.</i>	
2.9.2 Notify appropriate part of environmental failure on a per-site basis	<i>Notification is sent to system customers at site B and other off site customers regarding a planned power outage during a weekend period. This system unavailability notice is sent several weeks before-hand via various media.</i>	
2.9.3 Monitor progress of corrective actions to failure on a per-site basis	<i>Progress is monitored for all sites regarding corrective action taken, for example: monitoring the installation of a larger air conditioning unit shows fewer temperature alert alarms.</i>	
2.9.4 Monitor physical site management plan for its effectiveness on a per-site basis	<i>Each site is monitored to provide physical site management with areas of improvement or success, for example: HVAC alarms at three sites are down due to new thermostat installs.</i>	
2.9.5 Provide feedback on physical site management to physical site planning function	<i>Feedback via e-mail survey to data center operators is collected and incorporated into future physical site plan.</i>	

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>A policy regarding physical site management with regards to procedures is established and followed.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>All physical site management personnel have the appropriate documentation regarding regulatory /environmental controls, diagrams, security and safety measures.</i>	
	GP2.3 Ensure personnel receive the appropriate type	<i>New physical site management personnel are trained on the process, procedures and</i>	

	and amount of training	<i>technologies of the group. Organization wide, customers are aware of capabilities of physical site planning and management.</i>	
	GP2.4 Collect data to measure performance	<i>Data are collected to provide information, for example: monthly count of alarm activation's and types.</i>	
	GP2.5 Maintain communication among team members	<i>Physical site management collects/ logs issue and feedback. These are both noted in reports and provided to physical site planning for knowledge gain purposes.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>A complete tracking document or report showing the progression of a physical site management issue/problem progressing through to resolution.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>Version control is kept on the physical site management plan and change control documents are produced noting any referencing departments (i.e. physical site planning, security, etc.).</i>	

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an organization level	<i>Physical site management handles all site management issues according to a stated policy vs. ad hoc.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>Physical site management provides and subsequently obtains feedback from physical site planning and security via reports, meetings and e-mails.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>There is one centralized physical site management group that is responsible for all sites throughout the organization vs. each site using different methods or protocols.</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>New physical site management personnel receives training and all employees receive subsequent training from new skills, issues and technologies. Future employee requirements are addressed.</i>	

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Addressing and responding to physical site management issues based on strategic business needs vs. industry standards.</i>	
	GP4.2 Automate data collection	<i>Metrics are automatically collected from physical site management vs. a manual collection, for example: Time of day and reason UPS usage occurred, breakdown of test performed according to plan and their results, etc.</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>Metrics collected by physical site management personnel are analyzed and reported.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>Physical site management is evaluated against performance goals and metrics for suggested improvements and revisions to the process.</i>	

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>Physical site management is continuously improved via incremental changes, an example: upgrading of air filters to a smaller micron size for all computer room vents on three sites.</i>	
Process Change	GP 5.1: Deploy “best practices” across the organization	<i>Process improvement noted in 5.1 example is validated via metrics and business goals, for example: lower cost by 4% due to longer product life and 10% decrease in air conditioning maintenance.</i>	

Interview Guide

5

Process Area	2.9 Physical Site Planning & Management
Questions	
Base Practice: 2.9.0 Determine physical site needs	
Is there a procedure in place that plans for the control and management of construction, development or changes to the physical site? If yes, what it is? Is it followed? Who is responsible for this plan?	
Is the physical site planning handled via one plan or several? If more than one, why? Is feedback collected for one or all plans? If yes, how often and by whom?	
Are plans determined by balancing implementation costs with estimated business benefits? If yes, by whom (e.g. team, individual, management, etc.)?	
Does planning consider the following requirements and functions: hardware capacity and layout, HVAC and fire suppression, power, structural planning (i.e. mitigate Manmade or natural disaster), and integration with security planning & management? If yes, explain.	
Are business goals established for physical site planning and incorporated? If yes, by whom? How often is the plan reviewed?	
Base Practice: 2.9.1 Test environmental/regulatory control plans periodically on a per-site basis	
1. Is testing performed regarding environmental and regulatory controls on a periodic basis? If yes, how often for each site and by whom? If no, explain?	
What are the main environmental/regulatory concerns for each site? Please prioritize and explain?	
Are the plans for testing updated to include new equipment, regulations, etc.? If yes, how often are they reviewed and by whom?	
Base Practice 2.9.2 Notify appropriate part of environmental failure on a per-site basis	
When a failure is encountered are there identified contacts who you notify for each site? If yes, how is notification done (e.g. pager, e-mail, phone, etc.)?	
What are the most common failures within each site and how often do they occur? How is feedback from the various sites collected (e.g. reports, conference calls, e-mail, etc.)?	
Are data collected regarding the types of failures, response time, locations, reasons, etc? If yes, what data are collected and who receives this data? Are data collected on a manual basis or automatically?	
Base Practice: 2.9.3 Monitor progress of corrective actions to failure on a per-site basis	
Are corrective actions, in response to previous failures, monitored per site? If yes, how are they monitored and who is responsible for this? Are other related groups notified of changes or issues concerning any corrective action? If yes, how and when? If no, explain?	
Are metrics collected on the progress or status of physical site management procedures for each site? If yes, how often and are these collections done manually or are there software/automation tools in use? Are these metrics analyzed against goals and quantified objectives? If yes, by whom?	
Base Practice: 2.9.4 Monitor physical site management plan for its effectiveness on a per-site basis	
Are business goals and strategies for each site used to measure the success or failure of corrections	

and/or the general operation procedures for physical site management?
Are the physical site management tasks continuously improved? If yes, are these improvements deployed and measured for effectiveness?
Are enough resources available, as far as equipment, space, procedures, software and/or personnel on each site? If no, explain how the addition of resources would improve the effectiveness of a site (e.g. better monitoring, quicker response time, accurate data, etc.)?
Base Practice: 2.9.5 Provide feedback on physical site management to physical site planning function
Is feedback from physical site management forwarded to physical site planning? If yes, how (e.g. conference calls, reports, e-mail, etc.)?
Are the plans, procedure reviews, issues and problems for each site collected and addressed via one centralized group or is each site a completely separate entity? If separate, does each communicate with physical site planning?
Generic Questions for Process Area
Is there a written policy regarding physical site management's procedures? If yes, is it followed? Is version controlled enacted on this plan? Are change control documents regarding the plan cut and forwarded to appropriate departments?
Is training made available to new hires within physical site management? Is follow-up training covering new technologies, procedures, etc. provided? Are plans made for future employment needs within physical site management?
Is the entire physical site management process reviewed for continuous improvement? If yes, by whom and how often? Are the improvements deployed and measured against business goals and metrics? If yes, by whom?

Process Capability Assessment Instrument

Process Area	2.9 Physical Site Planning & Management
Process Area Description	Physical Site Management monitors the central and distributed sites' environment to ensure environments are being controlled properly according to environmental and regulatory levels. When necessary corrective actions are issued and monitored according to pre-defined environmental control plans.

5

Questionnaire

10

Process Area	2.9 Physical Site Planning & Management
--------------	---

		Yes	No	Don't Know	N/A
1	Is there a procedure in place that defines, controls and manages the physical site planning?				
2	Are environmental/regulatory control plans periodically tested on a per-site basis?				
3	Are the appropriate personnel/systems notified of an environmental failure on a per-site basis?				
4	Are corrective actions, in response to failures, monitored on a per-site basis?				
5	Is the physical site management plan monitored for its effectiveness on a per-site basis?				
6	Is feedback regarding physical site management forwarded to physical site planning?				

15

Work Product list

Process Area	2.9 Physical Site Planning & Management
--------------	---

- Procedures noting physical site planning (e.g. expansion, new layout, etc.)
- Procedures regarding environmental/regulatory control plans for each site
- Failure monitoring/reporting procedures for each site
- 5 Reports noting status of physical site management for each site
- List of risk issues for physical site management (e.g. earthquakes, wild fires, temperature extremes, brown/black outs, frequency of lighting strikes, tornadoes, etc.) for each site

Mass Storage Management (2.10)

PA Number	2.10
PA Name	Mass Storage Management
PA Purpose	Mass storage involves those activities related to the handling of various types of centralized and distributed storage media (e.g., tapes, disks, etc.) including the monitoring and controlling of storage resources and their usage. Mass Storage Management can be viewed as providing the top level of storage management with support form Archiving and Backup/Restore Management.
PA's Base Practices	Monitor and control storage usage Define usage standards for storage media Disk space management for Mass Storage Rectify problems with stateless file systems (e.g., hanging) Locate datasheets according to access priority Tape management
PA Goals	To avoid creating large data systems that cannot be backed up due to: volumes, bandwidth requirements, cross-platform dependencies, or poor hardware/software support. To ensure convenient location of hardware (single operations center/console is ideal).
PA's Metrics	Number of times per month data cannot be backed up due to breadth of system % of time when system lacks appropriate storage items Number of times per month On line data is accessed Number of times per month Near line data is accessed Number of times per month Off line data is accessed

Base Practices

BP Number	2.10.1
BP Name	Monitor and control storage usage
BP Description	Key factors in monitoring and controlling storage usage: Team of knowledgeable people Mass Storage tools to support items such as: Multiple platforms Multiple addressing media forms Media-sharing Scalability/flexibility Automated media management Use of hierarchical storage management (reduce online storage and tape backup requirements)
Example	<i>Qualified database administrators oversee the operation of a tool able to support the operating systems within the distributed environment, to determine available space, to assess the physical file placement and volume mappings, to eliminate fragmentation, and to manage the number/type/location of storage devices.</i>
BP Number	2.10.2
BP Name	Define usage standards for storage media
BP Description	Usage standards and support for storage media is typically defined in the following manner: System description documents Operational procedures documents Software description documents Contact list for help desk and problem resolution personnel Detailed and quick-reference Mass Storage Management software documentation Mass Storage Management software on-line help or context sensitive help Operating systems on-line help or manual pages Hard copy backups of Mass Storage Management configuration files or customized scripts

	Disaster recovery plan
Example	<i>Storage policies, naming standards and storage hardware configurations and characteristics (e.g. maximum usage level per device) are registered in the storage information database.</i>
BP Number	2.10.3
BP Name	Disk space Management for Mass Storage
BP Description	Determine the requirements for shared disk space. Partition the disk space as necessary.
Example	<i>A set of usage profiles is established to aid in allocating disk space. Once space is partitioned, drive access is restricted appropriately. Usage requirements are tracked so disk space allocation can be updated to reflect changes.</i>
BP Number	2.10.4
BP Name	Rectify problems with stateless file systems (e.g., hanging)
BP Description	Some ways to rectify stateless file system problems: Identify whether a file has been or is being changed during backup. Scheduling of backups during times when files are least likely to be in use. Lock files during backup.
Example	<i>During backup a log is generated to track all stateless files, unable to be backed up. Additional attempts to backup those files are made until a predefined threshold is reached. At that point, notification of unsuccessful backup of specific files is sent to appropriate parties.</i>
BP Number	2.10.5
BP Name	Locate Datasheets According to Access Priority
BP Description	The media hierarchy is typically broken up into the following levels: Frequently accessed data: On-line storage (e.g. harddrive) Moderately accessed data: Near-line storage (e.g. CD-ROM) Rarely accessed data: Off-line storage (e.g. tape) Determine how often data is access and decide what storage level is appropriate for that data. The data can be moved up and down this hierarchical format to fit the access needs of the data
Example	<i>A Hierarchical Storage Management (HSM) system is installed that determines which files are being accessed and which files should be moved to another form of storage. The HSM software looks at how often the customers are accessing various files then it categorizes them according to the age of the last access. The more frequently a file is accessed, the more likely it will reside on the fastest available level in the hierarchy.</i>
BP Number	2.10.6
BP Name	Tape Management
BP Description	Tape Management consists of the following tasks: Receiving requests to load tape Locating appropriate tape Determining where the tape needs to be loaded Loading tape onto machine Initiating tape read/write process Monitoring the tape process Removing the tape and file it into tape storage Maintaining tape library Allocating tapes Returning tapes to pool Labeling tapes
Example	A set of documented procedures is followed in performing activities involved in tape management. Clear labeling and location documentation for all tapes are maintained.

References

	MODE v2
	MODE v1 Toolkit

Process Area: Mass Storage Management

Level 1

Assessment Indicators: Process Performance

Generic Practice: Ensure that Base practices are performed

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
2.10.1 Monitor and control storage usage	<i>A mass storage management team exists and an appropriate tool is employed to monitor and control storage usage.</i>	
2.10.2 Define usage standards for storage media	<i>Documentation exists detailing storage policies, naming standards and storage hardware configurations, etc.</i>	
2.10.3 Disk space management for Mass Storage	<i>Usage profiles are maintained to aid in allocating shared disk space.</i>	
2.10.4 Rectify problems with stateless file systems	<i>During backups, all stateless files are tracked and subsequently backed up.</i>	
2.10.5 Locate datasheets according to access priority	<i>Data is stored in a "media hierarchy" (e.g. online, nearline and offline storage) which places frequently accessed data at levels or in storage mediums with faster retrieval provisions.</i>	
2.10.6 Tape Management	<i>Procedures for handling tapes (loading, read/write, labeling etc.) are specified and followed.</i>	

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>Documented policies specify usage standards and support for storage media.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>The mass storage management tool is adequate given the volume and variety of storage media controlled. The tool can support all platforms and media forms used in the distributed environment.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>Involved personnel receive training on the tool, tape management procedures and all policies related to mass storage management.</i>	
	GP2.4 Collect data to measure performance	<i>Data such as the following are collected: percentage of time when system lacks appropriate storage items, number of times per month that backups are unsuccessful due to breadth of the system.</i>	
	GP2.5 Maintain communication among team members	<i>The mass storage management team provides status reports to appropriate parties.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>Tape labeling and naming of other storage devices occurs according to documented specifications.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>If multiple copies of data are stored, mechanisms are in place to ensure that the labeling corresponds and any changes are applied to all copies (or appropriate note of the changes are made)</i>	

5

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an organization level	<i>All data storage occurring within the organization is tracked/controlled through a single mass storage management system.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals	<i>Planning of future human resource needs occurs for mass storage management, given organization and related storage growth</i>	

	consistently and repeatedly	<i>projections and/or new technology considerations.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>The functioning of the mass storage monitoring and control processes according to specifications keep backup problems at a minimum.</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>The storage management team provides feedback on the storage management process at periodic meetings.</i>	

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Quantitative targets for mass storage management performance are periodically set.</i>	
	GP4.2 Automate data collection	<i>The storage management tool automatically collects data on how frequently files are accessed and reassigns storage locations within the media hierarchy accordingly.</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>All data specified as necessary for mass storage management (e.g. available disk space, access frequencies) or for assessing the process are collected.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>Assessment metrics collected are compared to targets and discrepancies addressed.</i>	

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>The mass storage management process and relevant technologies are periodically reviewed to identify potential enhancements. Actions are taken to implement improvements identified.</i>	
Process Change	GP 5.1: Deploy “best practices” across the organization	<i>Any modifications of standards or processes are applied to all storage activities throughout the organization, where applicable.</i>	

5

Process Capability Assessment Instrument: Interview Guide

Process Area	2.10 Mass Storage Management
Questions	
Base Practice: 2.10.1 Monitor and Control Storage Usage	
What type of system or tool do you have in place for monitoring and controlling storage usage? What utilities does it have?	
Can the tool support all the operating systems within the distributed environment?	
Does the tool have the ability to assess the physical file placement and determine space availability?	
Does the tool allow for reordering of files to eliminate fragmentation?	
What media types are used for storage? Can the tool monitor all these media types?	
Who oversees or manages the monitoring and control process? What are their responsibilities?	
Base Practice: 2.10.2 Define Usage Standards for Storage Media	
What information is specified as part of the storage media’s usage standards? Are system descriptions, operational procedures, help-desk/problem resolution contacts, Mass Storage Management configuration files etc. included?	

Where is the usage standards documentation stored and who accesses these documents?
Who is responsible for maintaining usage standards documentation?
How frequently are usage standards reviewed and updated? What is the process for doing so?
Base Practice: 2.10.3 Disk Space Management for Mass Storage
What is the procedure for determining shared disk space requirements?
On what basis is disk-space partitioning done?
How is disk space allocation kept track of?
How frequently are disk space requirements reevaluated and space reallocated?
Base Practice: 2.10.4 Rectify Problems with Stateless File Systems
What mechanisms are employed to rectify backup problems resulting from stateless file systems?
Has an assessment been made of how well these mechanisms deal with the problem? If so, what was the outcome of the assessment?
Base Practice: 2.10.5 Locate Datasheets According to Access Priority
Does a storage media hierarchy (based on ease of access) exist and is data stored at particular levels based on defined strategies or priorities? If so, what are the levels of the hierarchy (e.g. online, nearline, offline) and how is data assigned to a particular level?
Are data moved around within the hierarchy? What circumstances initiate such location changes?
Is there an automated process for discerning what datasheets should be moved? (e.g. the storage management software keeps track of the number of times particular files are accessed and determines which files should be moved to make retrieval more efficient)? If manual intervention is required, what needs to be done and who does it?
Do you have any means of gauging the efficiency of your data organization at a particular time? If so how frequently is the efficiency assessed? Are any efficiency-related targets set?
Base Practice: 2.10.6 Tape Management
What is your procedure for requesting, locating and loading tapes?
Where are tapes stored? How is the location of each tape in storage tracked?
How do you ensure that all tapes are labeled? What information is recorded on the label?
Generic Questions for Process Area
Are problems ever experienced in running backups due to large data volumes, inadequate bandwidth or sub-optimal hardware/software support?
What type of training do storage management personnel receive on standards, policies and actual operation of the mass storage management system?
Are procedures audited to verify that standards and policies are being followed?
Are storage management operations periodically reviewed with the purpose of identifying potential improvements?
Do you find that the resources devoted to mass storage management satisfactorily meet the storage needs of the organization?

Process Capability Assessment Instrument

Process Area	2.10 Mass Storage Management
Process Area Description	Mass storage involves those activities related to the handling of various types of centralized and distributed storage media (e.g., tapes, disks, etc.) including the monitoring and controlling of storage resources and their usage. Mass Storage Management can be viewed as providing the top level of storage management with support form Archiving and Backup/Restore Management.

5

Questionnaire

Process Area	2.10 Mass Storage Management
--------------	------------------------------

10

		Yes	No	Don't Know	N/A
1	Do you use a storage management tool for monitoring and controlling storage usage?				
2	Do you have a dedicated mass storage management team for centralized and				

	distributed storage media management?				
3	Are usage standards for storage media defined?				
4	Are disk space requirements determined and is disk space partitioned accordingly?				
5	Are measures adopted to rectify problems with stateless file systems?				
6	Are data stored and moved around in the media hierarchy (eg. on-line, near-line, off-line) according to determined strategies or priorities?				
7	Are tape management procedures defined for retention, rotation and labeling of files?				

Work Product list

Process Area	2.5 Backup/Restore/Archiving
--------------	------------------------------

5

- Storage policies document
- Naming standards document
- Tape management procedures
- Usage level reports

10

Release Management (3.1)

PA Number	3.1
PA Name	Release Management
PA Purpose	<p>Release Management is the overall process of delivering an on-time release into production. Release Management is broken down into several areas, which are described below:</p> <p><u>Release Planning</u> Release Planning coordinates the release of updates to the distributed and central sites. Due to the fact that any change in the distributed environment may impact other components, releases must be planned carefully to ensure that a change will not negatively impact the distributed system.</p> <p>Release Planning defines the content of a release; groups new or changed software, data, procedures, training material and upgrade packages for distribution and implementation; applies versions to the release components, and creates a release schedule.</p> <p><u>Release Tracking</u> Release Tracking is the process of monitoring the progress of release contents and all releases.</p>
PA's Base Practices	<p>3.1.1 Analyze change request priorities</p> <p>3.1.2 Confirm technical feasibility of the release package</p> <p>3.1.3 Perform release requirements analysis</p> <p>3.1.4 Define contents of the release package</p> <p>Plan release testing</p> <p>Agree on and document release schedule, confirm with appropriate parties</p> <p>Report on progress of release plan</p>
PA Goals	<p>To ensure all changes are agreed upon, and managed throughout the release process.</p> <p>To monitor the release progress of all activities against the schedule to ensure that the schedule is maintained.</p> <p>To deliver an on time (based on the release schedule) release into production.</p> <p>To deliver new sites or services to existing sites on time based on the rollout schedule.</p>
PA's Metrics	<p>Total number of batch rollouts scheduled per month</p> <p>Number of hours used per month for rollouts</p> <p>% of time that rollout schedule is successfully adhered to</p> <p>Ratio of emergency versus planned changes</p>

Base Practices

BP Number	3.1.1
BP Name	Analyze change request priorities
BP Description	Determine if change is emergency or planned.
Example	<i>The management of change requests is done so that the impact is fully realized and prioritized for resource purposes. Some change order requests though may really be work orders for the help desk because of improper installation.</i>
BP Number	3.1.2
BP Name	Confirm technical feasibility of the release package
BP Description	Determine release effort based on SLAs. SLAs should outline the type of equipment the package will be installed on taking into consideration space and memory issues.
Example	<i>Service Level Agreements spell out specifically what is to be provided to the customer/s and when. These SLA's have to be reviewed in order to stay compliant.</i>
BP Number	3.1.3
BP Name	Perform release requirements analysis
BP Description	Perform assessment, and ensure the release is compatible with the current environment. Obtain understanding of workload for all resources.
Example	<i>When qualifying the need for the release and its technical requirements, all bases need to be covered when confirming (e.g. target environment, testing and logical data configurations, hardware and software resources, etc.).</i>
BP Number	3.1.4
BP Name	Define contents of the release package
BP Description	The purpose of this activity is to determine the boundaries of the release package.
Example	<i>Confirming the platform, distribution lists, configuration and data parameters provides scope and indicates the boundaries of a release</i>
BP Number	3.1.5
BP Name	Plan release testing
BP Description	The purpose of this activity is to prepare release work plans.
Example	<i>Work plans clearly define when a release will take place and the subsequent testing for a particular module, version or package. This allows all customers, management and Service Provider personnel to be prepared for releases and to better ensure success.</i>
BP Number	3.1.6
BP Name	Agree on and document release schedule, confirm with appropriate parties
BP Description	Document the release schedule and confirm it with appropriate parties Determine whether schedule will be impacted by issues or problems that arise. Change release schedule as necessary to address problems/issues.
Example	<i>Various departments need to agree to a release schedule (e.g. service desk, SLA administration, customers, etc.) and provide feedback to its validity or lack thereof due to issues/problems. Problems and issues could range from lack of resources, problem with hardware, training of customers, to inadequate lead time.</i>
BP Number	3.1.7
BP Name	Report on progress of release plan
BP Description	Distribute reports to appropriate parties, and provide feedback to the release coordinator.
Example	<i>Reports noting the progress of the release plan are distributed so that appropriate personnel within various departments can be scheduled for needed tasks. The reports should note the overall schedule of a release and any break downs for the individual departments and/or groups (e.g. service desk, software/data distribution group, SLA documents, etc.).</i>

References

	MODE v2
	MODE v1 Toolkit

Generic Practice: Ensure that Base practices are performed

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
3.1.1 Analyze change request priorities	<i>Each request is clearly marked with an emergency/non-emergency status (e.g. planned vs. unplanned). When questioned, rules of prioritization can be explained.</i>	
3.1.2 Confirm technical feasibility of the release package	<i>Results of impact analysis show that technical feasibility of release packages was evaluated.</i>	
3.1.3 Perform release requirements analysis	<i>Results of impact analysis show that payroll resource requirements (e.g. software and people) were assessed.</i>	
3.1.4 Define contents of the release package	<i>Platform, distribution lists, configuration and data parameters are considered for scope and contents of release.</i>	
3.1.5 Plan release testing	<i>Release work-plans are available that note testing schedules for modules, versions or packages and their subsequent release date.</i>	
3.1.6 Agree on and document release schedule, confirm with appropriate parties	<i>Payroll agrees on release schedule after it is confirmed with migration control and validation.</i>	
3.1.7 Report on progress of release plan	<i>Reports are distributed to various parties and feedback is coordinated.</i>	

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>A policy for release planning and tracking exists and is followed.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>Release management personnel have access to software, documentation and reports to perform their tasks.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>Training policy is in place for all new release management personnel. Organization wide, customers are aware of release management's capabilities.</i>	
	GP2.4 Collect data to measure performance	<i>Data are collected, for example: number of rollouts per month, number of emergency releases per month, etc.</i>	
	GP2.5 Maintain communication among team members	<i>Status reports covering progress, issues and problems are provided to other related areas and management. Feedback is provided via meetings, reports, etc.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>All release contents are defined and accessible prior to scheduling.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>Version control is placed on release components.</i>	

5

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an organization level	<i>There is one centralized release management area vs. several throughout the organization.</i>	

	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>New release management personnel receive training on the process. Subsequent training is provided for new technologies, software or procedures. Future employee requirements are addressed.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>Release management handles releases according to the stated policy vs. ad hoc.</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>Release management receive feedback from SLA, Service Desk, etc. via e-mail, reports or meetings regarding changes, concerns or issues.</i>	

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Release management processes are based on strategic business needs vs. industry standards.</i>	
	GP4.2 Automate data collection	<i>Metrics are automatically collected from the release management software tool vs. manual collection, for example: % of releases approved per month, % of on time delivery per month, etc..</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>Metrics are collected by release management personnel are analyzed and reported. Software tools may tie deployment and release management for improved data collection.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>Release management is evaluated against performance goals and metrics for suggested improvements and process revisions.</i>	

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and process	<i>Release management is continuously improved via incremental changes, an example: Change order requests reviewed for improper customer installation on a weekly basis.</i>	
Process Change	GP 5.2: Deploy “best practices” across the organization	<i>Process improvement notes in 5.1 example is validated via metrics and business goals, for example: review identifies 7% of requests are truly Service Desk issue, decreasing man hours for release management by 2.5%.</i>	

5

Process Capability Assessment Instrument: Interview Guide

Process Area	3.1 Release Management
Questions	
Base Practice: 3.1.1 Analyze change request priorities	
Have change request priorities been analyzed (emergency, non-emergency)? How?	
Are rollout plans put into place? Who is involved in this?	
How are emergencies documented?	
Base Practice: 3.1.2 Confirm technical feasibility of the release package	
Are SLAs considered for technical/compliance issues? If no, why not?	
How is the technical feasibility of the release package confirmed (e.g. meetings,	

conference calls.)? With whom (e.g. operations, vendors, etc.)?
Are model and architecture requirements in place for “new” releases? If no, why?
Base Practice: 3.1.3 Perform release requirements analysis
1. Identify which work flow tools are utilized?
Have the resource requirements been analyzed (e.g. hardware, software, people, etc.)? If yes, by whom?
3. Is there a process model in place that provides a “big picture” view?
Base Practice: 3.1.4 Define contents of the release package
1. Are the versioned application/system software and hardware platforms defined? If yes, by whom?
2. Are operation/test procedures clearly defined and distributed? If yes, what are the testing procedures? If no, why?
3. Is the test/reference data and configuration parameters required documented? If no, why? If yes, what are the parameters?
Base Practice: 3.1.5 Plan release testing
Do the work plans include release dates for all modules/versions (e.g. hardware, software, application, etc.) being released? If no, why?
2. Is appropriate lead time provided to customers prior to release and subsequent training? How is this lead time and training communicated?
3. Who in management reviews release plans? Does management quantify and qualify objectives for all release management processes performed?
4. Is the release fallback/contingency approach defined? If yes, elaborate.
Base Practice: 3.1.6 Agree on and document release schedule, confirm with appropriate parties
How is the overall release plan/effort managed and coordinated with the appropriate parties?
2. Is feedback on implementation of releases received and reviewed? If yes, by whom?
Base Practice: 3.1.7 Report on progress of release plan
What reports are produced regarding release planning? How are these updates/reports distributed (e.g. meeting reviews, e-mail, hard copy, etc.)? Who are these reports distributed to?
Generic Questions for Process Area
1. Are there release management procedures/policies noting how change orders, schedules, reports, analysis and feedback are processed? If yes, what are the procedures? Is this followed? If not, why?
2. Please describe training for release management personnel? Is this enacted for new and well as existing staff members?
3. What metrics are collected on the release management process to measure success/completion/failure? Are adequate resources provided to gather these statistics? What is done with these metrics?
4. Are standardized checklists, processed and required deliverables noted to personnel who perform the release process? If yes, what is used (e.g. checklists, process, etc.)?
5. Is the release management process reviewed for continuous improvement and are these improvements enacted? If yes, how is the improvement validated against business and performance goals (e.g. benchmarks, basic measurements, etc.)?

Process Capability Assessment Instrument

Process Area	3.1 Release Management
Process Area Description	Release Management is the overall process of delivering an on-time release into production. Release Management is broken down into several areas, which are described below: Release Planning Release Planning coordinates the release of updates to the distributed and central sites. Due to the fact that any change in the distributed environment may impact other components,

	<p>releases must be planned carefully to ensure that a change will not negatively impact the distributed system.</p> <p>Release Planning defines the content of a release; groups new or changed software, data, procedures, training material and upgrade packages for distribution and implementation; applies versions to the release components, and creates a release schedule.</p> <p><u>Release Tracking</u> Release Tracking is the process of monitoring the progress of release contents and all releases.</p>
--	--

Questionnaire

Process Area	3.1 Release Management
--------------	------------------------

5

		Yes	No	Don't Know	N/A
1	Are change requests prioritized over others because of their emergency status (e.g. Emergency over planned requests)?				
2	Are service level agreements and technical feasibility/impact considered when determining technical issues for the release?				
3	Are procedures followed to ensure that the release is compatible with the existing distributed environment?				
4	Is a procedure in place and used which helps determine the contents and scope of a future release?				
5	Are release work plans/schedules prepared in advance of the actual release?				
6	Are schedules agreed upon and dates confirmed with all related parties prior to the actual release?				
7	Are reports on the progress of release plans provided?				

Work Product list

Process Area	3.1 Release Management
--------------	------------------------

10

- Documented release procedures
- Example of a past release schedule
- Example of configuration parameters
- Example of build procedures and scripts
- Example of operations procedures
- Example of customer procedures

15

- Example of customer training materials
- Example of legacy data interfaces
- Example of early release rollout process successes and failures.

Change Control (3.2)

PA Number	3.2
PA Name	Change Control
PA Purpose	<p>Change Control is responsible for coordinating and controlling all change administration activities with the enterprise environment (i.e. document, impact, authorize, schedule, implementation control). Change Control determines if and when a change will be carried through in the enterprise environment. Change potentially covers all events that impact application software, systems software, or hardware.</p> <p>Changes may often be divided into categories, for example: New capability, such as new applications or hardware components. Modifications, which can change functionality, improve performance, etc. Maintenance, typically to correct errors. Emergency, which require immediate attention and correction/implementation.</p>
PA's Base Practices	3.1.1 Change Initiation 3.1.2 Change Impact Analysis/Assessment

	<p>3.1.3 Change Approval 3.1.4 Change Communication and Scheduling 3.1.5 Change Implementation Planning and Preparation 3.1.6 Change Request Tracking 3.1.7 Change Implementation 3.1.8 Change Backout and Contingency Planning 3.1.9 Change Reporting 3.1.10 Change Post-Implementation Reviews</p>
PA Goals	<p>To increase the tracking of changes in software development. To establish a more accurate estimate of how long the change will take, identify any unanticipated impacts of the change and to identify the resource requirements. To provide a process to make changes to software more visible. To facilitate communication between software development teams, their management, and their clients. To reduce the risk a change could have on the enterprise environment.</p>
PA's Metrics	<p>Number of requests placed through Change Control on a monthly basis Percentage of requests declined by Change Control Number of requests scheduled by Change Control each month Percentage of requests not completed by Change Control on time Percentage of requests which are urgent Number of request put on hold each month</p>

Base Practices

BP Number	3.2.1
BP Name	Change Initiation
BP Description	The change request serves as a formal record to document and track the status of a change from identification to its eventual completion. In this activity, a change request is created and logged, and the criticality of the change is determined. Receipt of change request with the requestor is confirmed.
Example	<i>The requester completes and submits a 'Change Request Form' that contains information such as the date the Change Request Form was completed, the name and signature of the employee requesting the change, the type of change request (systems, security, or other), the description of the change, rationale for the change, and the priority. The Change Request Form is logged in the change control database.</i>
BP Number	3.2.2
BP Name	Change Impact Analysis / Assessment
BP Description	Before proceeding with a change request, a detailed understanding of the change's impact on the system is documented. The purpose of the change impact analysis is to assess both business and technical implications of making that change. Key steps in this activity are to: Determine effort required to fulfill change Determine dependencies and milestones for the change request
Example	<i>Impact analyses are performed to determine the customers, workstations, file/application/database servers, and service levels impacted by the proposed change. In addition, dependencies to other applications, databases or systems are identified.</i>
BP Number	3.2.3
BP Name	Change Approval
BP Description	Authority to proceed with a Change Request can come from various sources depending on the type of change. The organization must be able to cope with not only varying types of change but varying urgencies as well. Change Requests coming from multiple sources may need to be prioritized.
Example	<i>Depending on the impact level of the change, a change request requires the Change Control Coordinator's or the Managing Director's signature before it will be implemented. It is up to the person giving approval to clarify any concerns regarding the change request with the requestor (or the business leader, as appropriate). If necessary given the urgency of other requests received, the priority level of the change request might be changed.</i>
BP Number	3.2.4
BP Name	Change Communication and Scheduling
BP Description	As a result of the detailed analysis, the release schedule will need to be updated, in order to communicate a more accurate completion date. The time estimates and completion date must

	be coordinated with other project completion dates, and available resources to determine which release the change will belong to.
Example	<i>The change request is reviewed and the time to complete the change is estimated. The estimate and the date of the estimate (complete date) are entered in the change control log. Similar or related change requests might be grouped and assigned to a single change control team.</i>
BP Number	3.2.5
BP Name	Change Implementation Planning and Preparation
BP Description	Before a Change may be initiated in the client environment, all affected parties must be notified. Change Notifications must be completed prior to any change. Notifications should be given with enough advance notice so affected parties may plan accordingly.
Example	<i>Affected parties identified during the impact assessment are notified of the change and if necessary, scheduled time of system unavailability.</i>
BP Number	3.2.6
BP Name	Change Request Tracking
BP Description	The purpose of this activity is to track the implementation of the change and initiate appropriate action as needed.
Example	<i>The change control log notes information such as necessary escalation or an approaching/passed estimated complete date, so that action can be taken to do the needed.</i>
BP Number	3.2.7
BP Name	Change Implementation
BP Description	The purpose of this activity is to verify that the change was successful. The Change Coordinator is responsible for reviewing functionality testing and documenting the results.
Example	<i>If appropriate, completed change requests are tested to make sure the change corresponds with the design and to identify any unpredicted impacts.</i>
PB Number	3.2.8
PB Name	Change Backout and Contingency Planning
PB Description	The purpose of this activity is to ensure that back out plans and contingency plans are in place in the event that problems arise.
Example	<i>Courses of actions are outlined to reverse change or to serve as alternative methods of achieving desired outcome, in the event of unpredicted consequences.</i>
BP Number	3.2.9
BP Name	Change Reporting
BP Description	The purpose of this activity is to report on changes made to the operations environment. Changes put on hold, cancelled, etc. should also be reported on.
Example	<i>Monthly reports are generated detailing the status of change requests. Completed changes as well as pending changes are noted.</i>
BP Number	3.2.10
BP Name	Change Post-Implementation Reviews
BP Description	Inform requestor that change is complete, and close the request. Provide an audit trail of all change requests
Example	<i>The change control coordinator notifies the change requester of the completed request. Confirmation of successful completion is sought from the change requester. The logged status of the request is changed to closed once rollout management completes the change and confirmation is received from requestor.</i>

References

	MODE v1 Toolkit
	MODE v2

Process Area: Change Control

Level 1

Assessment Indicators: Process Performance

Generic Practice: Ensure that Base practices are performed

5

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
---------------	---------------------------------	---------------------------------

3.2.1 Change Initiation	<i>A log shows change requests are recorded at time of receipt.</i>	
3.2.2 Change Impact Analysis/Assessment	<i>Impact analysis template or an example of completed analysis report.</i>	
3.2.3 Change Approval	<i>Example of completed change request form shows authorization by appropriate personnel.</i>	
3.2.4 Change Communication and Scheduling	<i>A system for coordinating the planned date of a change with other activities is in place.</i>	
3.2.5 Change Implementation Planning and Preparation	<i>When questioned, the process for notifying all affected parties of a change can be explained.</i>	
3.2.6 Change Request Tracking	<i>Change control log shows that each change request is tracked until completion and the log updated at important milestones.</i>	
3.2.7 Change Implementation	<i>Results of testing of implemented changes exist.</i>	
3.2.8 Change Backout and Contingency Planning	<i>Contingency and/or back-out plans are available for each planned change.</i>	
3.2.9 Change Reporting	<i>Example of reports detailing completed, suspended and pending changes.</i>	
3.2.10 Change Post-Implementation Reviews	<i>Example of notification of change completion that is sent to the requestor.</i>	

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>A documented policy is maintained, that describes procedures for requesting changes, time-frames for implementing changes, and change reporting requirements.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>Adequate resources enable scheduled changes to be completed on time and according to plan.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>All new employees receive training on change control policies and procedures.</i>	
	GP2.4 Collect data to measure performance	<i>Data is collected to measure the change control process. For example: Percentage of requests declined by Change Control, Number of requests scheduled by Change Control each month, Percentage of requests not completed by Change Control on time.</i>	
	GP2.5 Maintain communication among team members	<i>Issues are tracked and logged. The Change Control team provides status reports.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>All required information from a change request is logged. Logs are updated at all necessary milestones.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>Modifications to reporting requirements or report formats are duly noted and applied.</i>	

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an organization level	<i>Procedures for requesting changes are known throughout organization, If applicable, change request forms are</i>	

		<i>readily available.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>Planned changes are reviewed to project the need for additional staff or human resource qualifications.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>Change requests are always handled according to the documented policy (e.g. requests are not processed without appropriate approval).</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>On completion of a change request, feedback is solicited from the requester.</i>	

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Quantitative performance targets are periodically set.</i>	
	GP4.2 Automate data collection	<i>Capability numbers are estimated for the defined performance metrics.</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>All predefined metrics are collected and distribution to appropriate parties.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>Performance metrics are compared to targets and discrepancies addressed.</i>	

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>The Change Control process and relevant technologies are periodically reviewed to identify potential enhancements. Actions are taken to implement improvements identified.</i>	
Process Change	GP 5.1: Deploy “best practices” across the organization	<i>All appropriate parties in the organization are informed of new/modified procedures aimed at improving the Change Control process.</i>	

5

Process Capability Assessment Instrument: Interview Guide

Process Area	3.2 Change Control
--------------	--------------------

10

Questions
Base Practice: 3.2.1 Change Initiation
How is a change initiated? Is a change-request form completed and submitted? What information is required on a change-request form?
Is confirmation of request receipt sent?
Where is a change-request logged? What information is recorded when a change-request is logged?
Does each change-request receive a priority level? If so, what are the various priority levels and what action or service level does a particular priority level warrant? Does a documented policy specify these actions/levels?
Does the requestor specify the criticality of the change or do change control personnel determine the request’s priority level? If the latter is the case, on what basis is a criticality level assigned to the

request?
Base Practice: 3.2.2 Change Impact Analysis/Assessment
What type of analysis of the change's impact is performed? What issues are considered?
Are both technical and business implications taken into consideration?
Is the effort required to complete the change determined?
Who performs the analysis and who reviews it?
What are the consequences of the change impact analysis (i.e. is the change request rejected if the change analysis yields particular results)?
Base Practice: 3.2.3 Change Approval
Whose approval is needed before a change request can be implemented? Does the person(s) whose approval is necessary depend on the scope or priority level of the change?
How is approval obtained and documented?
Is the change requestor notified of change approval or rejection?
Base Practice: 3.2.4 Change Communication and Scheduling
Once approval is obtained, what is the process for estimating the time and scheduling the change?
Are other completion times and dates factored into the estimated time of a change to be implemented?
Does a master schedule exist on which the change is noted, or how is the scheduled change communicated to appropriate parties?
Base Practice: 3.2.5 Change Implementation Planning and Preparation
Who is notified of an impending change?
How does change notification take place?
How much time before the implementation of the change does notification occur?
If the system or parts of the system will be unavailable during the change implementation, how is this unavailability managed?
Base Practice: 3.2.6 Change Request Tracking
What is the process for tracking the implementation of a change request?
What events or conditions related to the change request are logged, i.e. when is the change request status updated?
Is the log reviewed to identify changes that might be overdue or that require additional action?
Base Practice: 3.2.7 Change Implementation
If necessary are change requests escalated/re-routed? What is the process for doing so? Is this process documented and followed?
How is successful completion of the requested change testified or verified?
Who is responsible for verifying the successful completion of the change?
Base Practice: 3.2.8 Change Backout and Contingency Planning
For what types of changes are back-out or contingency plans devised? Does a policy exist specifying changes that require such plans?
Where are back-out/contingency plans documented?
How frequently (often, rarely, never) are these back-out or contingency plans utilized?
Base Practice: 3.2.9 Change Reporting
What reports are generated pertaining to changes? What are the contents of these reports?
Do the reports follow documented guidelines on format and content?
How frequently are these reports created and disseminated?
Who views these reports and for what purposes?
Base Practice: 3.2.10 Change Post-Implementation Reviews
Is requestor notified of change completion and confirmation received?
What is the process for closing a change request?
Is an audit trail of each change request stored? If so, what documentation is saved?
Can the audit trail for a particular change request be obtained? If so, how?
Generic Questions for Process Area
Are any metrics (e.g. percent of change requests completed on time, percent of requests put on hold) collected to measure performance of the change control process? If so, what are they?
Are any quantitative performance targets set for change control? If so, please describe them. Is performance evaluated against these targets?
What type of training do change control personnel receive? Are employees aware of all document policies and procedures?
Is the change control process periodically reviewed/evaluated with the intent of identifying potential

improvements?

Process Capability Assessment Instrument

Process Area	3.2 Change Control
Process Area Description	<p>Change Control is responsible for coordinating and controlling all change administration activities with the enterprise environment (i.e. document, impact, authorize, schedule, implementation control). Change Control determines if and when a change will be carried through in the enterprise environment. Change potentially covers all events that impact application software, systems software, or hardware.</p> <p>Changes may often be divided into categories, for example: New capability, such as new applications or hardware components. Modifications, which can change functionality, improve performance, etc. Maintenance, typically to correct errors. Emergency, which require immediate attention and correction/implementation.</p>

5 Questionnaire

Process Area	3.2 Change Control
--------------	--------------------

		Yes	No	Don't Know	N/A
1	Do you have a system for recording and tracking all change requests submitted?				
2	Prior to implementing a proposed change, is an impact analysis performed to identify the effects of the proposed change?				
3	Does a change request require approval from designated personnel before being implemented?				
4	Are the implementation time and completion date estimated and scheduled?				
5	Are all affected parties notified of a scheduled change?				
6	Is the implementation of a change tracked and logged?				
7	When applicable, does testing of the change occur?				
8	Are contingency or back out plans in place in the event that problems arise with the change?				
9	Does periodic reporting occur on the changes to the operations environment?				
10	Is the change requestor informed when the change is complete?				
11	Is an audit trail of all changes available?				

10 Work Product list

Process Area	3.2 Change Control
--------------	--------------------

- 15 Change request form
- Sample change control log record
- Change control reports
- Complete audit trail of a change request
- Impact analysis results
- Master change control schedule
- 20 Example of back-out/contingency plan

Validation (3.3)

PA Number	3.3
PA Name	Validation
PA Purpose	<p>Validation involves testing potential hardware and software for the distributed environment prior to procurement to determine how well a product will fulfill the requirements identified. Validation also ensures that the implementation of a new product will not adversely affect the existing environment.</p>

PA's Base Practices	3.3.1 Determine what needs to be tested for the product 3.3.2 Prepare test plans 3.3.3 Document test inputs and expected results 3.3.4 Install new product in test environment 3.3.5 Test product and evaluate results 3.3.6 Perform regression testing on environment & system's functionality
PA Goals	To ensure product meets business requirements To ensure that new product conforms to the production architecture To verify the reliability, operability and performance of the product
PA's Metrics	Percentage of new items migrated successfully Average test set up time

Base Practices

BP Number	3.3.1
BP Name	Determine what needs to be tested for the product
BP Description	The specification of what needs to be tested is guided by the business requirements and technical standards that the product needs to meet. Capacity, performance, reliability, operability, compatibility (system interface and technical architecture) and stress tests need to be performed.
Example	<i>The testing requirements verify that the product functionality properly supports the business processes. Testing also verifies that the object conforms to the production architecture environment and that there will be no incidents caused by hardware, software, version or communication incompatibilities.</i>
BP Number	3.3.2
BP Name	Prepare test plans
BP Description	Planning the test is the most critical part of the entire validation process. Proper test planning can eliminate substantial rework in the subsequent phases. The following tasks must be completed in this phase: specify test environment develop testing approach, test model and test requirements review all required test documents establish test execution schedule
Example	<i>The test planning process involves determining what resources, data, measurements and activities will be required. The time to complete the test is estimated. As the processes mature time estimates are formalized and time to complete is solidified.</i>
BP Number	3.3.3
BP Name	Document test inputs and expected results
BP Description	Based on the test plans, input data are determined to satisfy each of the testing requirements. Expected outcomes corresponding to each input item are also specified.
Example	<i>Test documents are prepared that link each testing requirement or test condition to appropriate input and expected output values.</i>
BP Number	3.3.4
BP Name	Install new product in test environment
BP Description	In preparing the test environment, the following tasks are completed: Verify that the hardware, software, network, etc. has been properly setup Establish the proper access and accounts to required systems and libraries or verify that they already exist. Establish or verify the appropriate interfaces between systems. Ensure that the standard and custom test cycles/scripts are in the appropriate libraries/regions for test execution. Establish appropriate monitoring/data capture methods for the test execution. This includes monitoring and automated reporting and data capture tools. Load test data in the appropriate libraries and regions of the test environment. Also, clear data from previous tests as necessary Install new product and confirm that the appropriate components are in place
Example	<i>A test environment exists that has a switchable channel to the production environment. This arrangement allows for the copying of information from the production to test environment. The new product is then installed in the test environment and prepared for testing.</i>

BP Number	3.3.5
BP Name	Test product and evaluate results
BP Description	Product is tested in the test environment against all the predefined requirements, using the input data specified. Test results are evaluated against the documented expected outcomes. User confirmation of business functionality, system navigation/ease of use, and adequacy of training/job aids is obtained.
Example	<i>During testing, the following tasks are performed: All application logic, calculations, navigation, conformance to standards, exception/error processing and reporting detail is tested. All program-to-program interfaces, logical business units of work, and daily/weekly/monthly/year-end processing is tested. The testing verifies that the product executes normally including startup and shutdown of applications and hardware operates without failure. Products installation method is documented and installation issues noted.</i>
BP Number	3.3.6
BP Name	Perform regression testing on environment & system's functionality
BP Description	Regression testing is the process of testing previously existing functionality after the addition of a new module or component to the system. Regression testing ensures that a modification or addition does not generate errors by having unintended effects on other existing areas.
Example	<i>If a new version of a software application is under consideration, the same test cases run on the previous version are run on the new one to ensure that the old capabilities continue to be present. In the case of hardware, the product being tested is shown to not cause disruption to existing systems including, but not limited to, servers, network traffic, and existing applications.</i>

References

	MODE v2
	MODE v1 Toolkit
	Corning's Integrated Testing and Certification Lab – Scope Document and Workplan
	Service Delivery Testing - Requirements Definition (Kraft Foods)

- 5 Process Area: Validation
- Level 1
- Assessment Indicators: Process Performance
- Generic Practice: Ensure that Base practices are performed

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
3.3.1 Determine what needs to be tested for the product	<i>An example testing requirements document shows that business requirements, technical standards etc. are evaluated.</i>	
3.3.2 Prepare test plans	<i>Test preparation documents, such as necessary resources/data lists and test execution schedules exist.</i>	
3.3.3 Document test inputs and expected results	<i>Test scripts are created that detail input data and expected results for each testing requirement.</i>	
3.3.4 Install new product in test environment	<i>Prior to testing, a test environment is appropriately prepared and the product installed.</i>	
3.3.5 Test product and evaluate results	<i>All specified testing requirements are tested and test reports are produced.</i>	
3.3.6 Perform regression testing on environment & system's functionality	<i>Regression testing results show that previously existing functionality is tested.</i>	

10

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client

Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>A documented policy is maintained that specifies in general terms any standard tests that need to be performed for every new product.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>Sufficient resources exist so that all needed testing occurs on schedule.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>Validation personnel receive training on any testing tools used and all validation policies/procedures.</i>	
	GP2.4 Collect data to measure performance	<i>Data such as the following are collected: percentage of new items migrated successfully, average test set up time.</i>	
	GP2.5 Maintain communication among team members	<i>The validation team provides status reports to appropriate parties.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>Test plans and test scripts are produced according to documented specifications.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>If the product is tested at multiple levels (unit, system etc.), a method for keeping track of all documents belonging to each test exists.</i>	

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an organization level	<i>Validation of all new products for the distributed environment is controlled or overseen by a single central validation team.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>When new technology for testing is considered, corresponding human resource requirements are projected and planned for if the new technology is to be adopted.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>The validation process manages to keep problems with new products at a minimum.</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>The validation team provides feedback on the validation process and raises any issues or concerns at periodic meetings.</i>	

5

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Quantitative targets are set for assessing the effectiveness of the validation process.</i>	
	GP4.2 Automate data collection	<i>Automated monitoring and data capture tools are used during test execution.</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>All specified metrics for assessing the validation process are collected.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>Assessment metrics collected are compared to targets and discrepancies addressed.</i>	

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>The validation process and relevant technologies are periodically reviewed to identify potential enhancements. Actions are taken to implement improvements identified.</i>	
Process Change	GP 5.1:Deploy “best practices” across the organization	<i>All appropriate parties in the organization are informed of new/modified procedures aimed at improving the validation process.</i>	

Process Capability Assessment Instrument: Interview Guide

5

Process Area	3.3 Validation
--------------	----------------

Questions
Base Practice: 3.3.1 Determine what needs to be tested for the product
What is the process for identifying all that needs to be tested for a new product? Are business requirements reviewed and taken into consideration?
Has a general set of technical standards been defined for components of the distributed environment? If so, are the testing requirements defined to ensure that compliance with these standards will be tested?
For any product are there certain standard tests performed (e.g. capacity, operability, compatibility etc.)? If so, what are these tests?
Base Practice: 3.3.2 Prepare test plans
What tasks are completed while preparing test plans?
Is a test environment specified, and the necessary preparations detailed?
How is the appropriate testing approach and test model developed?
What test plan documents are produced? Are these a standard set of documents produced for every testing project? If not, how might they vary?
Are all resources required for the testing process identified? Who is in charge of identifying them, (i.e. are others consulted for this decision or is this just done by the validation team)?
Who is involved in creating the final test plans? Who reviews the final test plan documents?
Base Practice: 3.3.3 Document test inputs and expected results
What document(s) are prepared detailing all test inputs to be used and the expected results? What other information do these documents contain? Are these documents prepared according to predefined specifications?
Are the test inputs/expected results directly linked back to individual testing requirements identified earlier?
Base Practice: 3.3.4 Install new product in test environment
Please describe the test environment used for testing. Does a single environment exist for all testing purposes?
Does the test environment cover all operating systems, configurations, applications, etc. that are in the production environment?
What tasks or activities are involved in preparing the test environment for the installation of a new product (e.g. verifying proper setup of hardware, software, network, clear data from previous tests, load test data in appropriate regions)? Are these procedures documented?
Can information be copied from the production environment to the test environment? If so, typically what information is transferred? How is this information transferred?
Is the product’s installation method documented and installation issues noted? Does the installation follow a standard process or policy for all new installations? If yes, please describe this policy or process.
Base Practice: 3.3.5 Test product and evaluate results
Are all predefined testing requirements tested? Are any mechanisms in place to ensure that all

specified test cases are run? If yes, what are these mechanisms?
Are any tools used for automated testing? If so, please describe them. Approximately what proportion of testing is automated and what proportion is performed manually?
Who manages/controls the testing process? What are his/her responsibilities?
In addition to testing the product functionality, is the product's business functionality verified (i.e. does the product meet the business requirements for which it is intended)? If so, what is the process for doing so?
If appropriate, is the product tested on customers to check system navigation/ease of use and adequacy of training/job aids that accompany the product?
What reports or documents are produced as the output of the testing process? What information is presented and who receives this information? Have reporting guidelines been defined?
Base Practice: 3.3.6 Perform regression testing on environment and system's functionality
What is the process for identifying the requirements for regression testing?
Is any tool employed for automated regression testing? If so, please elaborate. Does this tool meet all regression testing requirements? If not, where does it fall short? How are these shortcomings addressed?
Are any manual or automated test scripts created and retained for reuse during future regression testing activities? If yes, are these test scripts periodically updated or changed to accommodate new processes or requirements? Who updates these scripts?
If regression testing results show that the product has unintended impacts on other areas, what is done? Is the change rolled back? Who decides that a roll back should occur and at what point during the process does this happen?
Generic Questions for Process Area
Does a designated "validation team" exist? If so, please describe the roles and responsibilities of members of the team. How does the team coordinate its activities?
What other groups does validation interface with? Where do requests for testing of a particular product originate?
Are the testing process and new technologies periodically evaluated to identify potential improvements? Are associated future human resource requirements considered? How frequently does such a review occur? Who is involved in the process?
What type of training do testing personnel receive? Does formal training occur or does training primarily occur on-the-job?
Are any statistics collected for purposes of evaluating the testing process (e.g. percent of successful migrations of tested products)? If so please describe them and the method by which they are collected. Are targets for these metrics set? What is the process for assessing performance against these targets? How has performance been vis-à-vis the targets defined?
Do you find that adequate resources are allocated for validation activities. Please elaborate.

Process Capability Assessment Instrument

Process Area	3.3 Validation
Process Area Description	Validation involves testing potential hardware and software for the distributed environment prior to procurement to determine how well a product will fulfill the requirements identified. Validation also ensures that the implementation of a new product will not adversely affect the existing environment.

5

Questionnaire

Process Area	3.3 Validation
--------------	----------------

10

		Yes	No	Don't Know	N/A
1	In preparation for testing of a new product for the distributed environment, are all conditions that need to be tested determined?				
2	Is a testing approach/test model developed?				
3	Is a schedule for executing the test developed?				

4	Are test scripts created that document all test inputs and expected results?				
5	Is the new product installed in a test environment?				
6	Is the product tested against all the predefined requirements?				
7	Is regression testing performed to verify that the new product will not adversely affect existing functionality?				

Work Product list

Process Area	4.3 Validation
--------------	----------------

5

Sample test plans (e.g. test requirements, test execution schedule)

Sample testing documents (e.g. test scripts)

Sample test report

Technical standards required of all products

10

Deployment (3.4)

PA Number	3.4
PA Name	Deployment
PA Purpose	Deployment monitors the rollout schedule against the activities taking place to ensure that rollout happens smoothly according to the planned schedule. As there are many dependencies within a distributed system, deployment can become highly complex and must be synchronized. In addition, numerous groups within and external to the organization will be involved in the rollout. Deployment is responsible for managing these groups, coordinating the information received from these groups, and determining whether or not the schedule will be negatively impacted by any activity taking place. If changes to the schedule are required, Deployment is responsible for coordinating the changes across all of the groups involved and seek management approval for the changes.
PA's Base Practices	Confirm schedule with all key groups periodically Determine whether schedule will be impacted based on issues or problems that arise Change deployment schedule as necessary to accommodate issues/problems Report on progress of deployment plan Disseminate reports to appropriate parties Provide feedback on the deployment to deployment planning
PA Goals	To ensure all changes are agreed upon, and managed throughout the release process. To monitor the release progress of all activities against the schedule to ensure that the schedule is maintained. To deliver an on time (based on the release schedule) release into production. To deliver new sites or services to existing sites on time based on the rollout schedule.
PA's Metrics	Total number of batch rollouts scheduled per month Number of hours used per month for rollouts % of time that rollout schedule is successfully adhered to Ratio of emergency versus planned changes

Base Practices

BP Number	3.4.1
BP Name	Confirm schedule with all key groups periodically
BP Description	Appropriate lead times for system rollouts are needed to establish and allow customers to prepare.
Example	<i>Schedule confirmations with internal and external groups might refer to dates, times, contingency dates and times (if problems arise) and deliverables.</i>
BP Number	3.4.2
BP Name	Determine whether schedule will be impacted based on issues or problems that arise
BP Description	Suggested schedules provided to external and internal groups may be affected by feasibility, resource or lead time issues.
Example	<i>An external vendor group may need to evaluate whether hardware installation prior to deployment can be completed.</i>
BP Number	3.4.3

BP Name	Change deployment schedule as necessary to accommodate issues/problems
BP Description	Communication with internal and external groups may result in a scheduling conflict or a need for longer lead time. The deployment schedule should accommodate this issue and managerial approval should be gained.
Example	<i>If an external vendor cannot complete hardware installations prior to scheduled deployment, the deployment schedule should be changed accordingly and management should approve prior to any advancement.</i>
BP Number	3.4.4
BP Name	Report on progress of deployment plan
BP Description	The current status of deployment and any successful/failed/backout activities need to be recorded/reported.
Example	<i>If a deployment has failed in a component, then subsequent data need to be distributed as to the problem, solution, time frame and any other components that maybe affected.</i>
BP Number	3.4.5
BP Name	Disseminate reports to appropriate parties
BP Description	Internal, external, Service Provider deployment personnel, management and customers need to be advised of the current status of deployment and any effects which might affect their activities or any future deployment schedule.
Example	<i>The service desk personnel should be made aware/reminded that a particular deployment may affect some processing temporarily until its completion.</i>
BP Number	3.4.6
BP Name	Provide feedback on the deployment to deployment planning
BP Description	Completion of deployment milestones need to be communicated and tracked. Frequent feedback/communication from various groups should be collected and be represented in any deployment schedule/report apparatus.
Example	<i>Feedback from customers to management via hardcopy, meetings, etc. can add value to subsequent deployment schedules, activities, and ideally add value as a learning/benchmark tool.</i>

References

	MODE Toolbook
	MODE v2
	Questionnaire and Interview source: INSURE System Requirements – Section II

Process Area: Deployment

Level 1

Assessment Indicators: Process Performance

Generic Practice: Ensure that Base practices are performed

5

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
3.4.1 Confirm schedule with all key groups periodically	<i>Feedback is received during a meeting with payroll noting the approval of a May deployment, as the new date is after the tax season. An electronic or hard copy schedule noting prep, training and customer types is available.</i>	
3.4.2 Determine whether schedule will be impacted based on issues or problems that arise	<i>When questioned, personnel can describe what would impact a deployment schedule.</i>	
3.4.3 Change deployment schedule as necessary to accommodate issues/problems	<i>When questioned, personnel can describe how changes to schedule are made, communicated etc.</i>	
3.4.4 Report on progress of deployment	<i>Deployment is tracked via reports that indicate successes/failures/back outs. Reports from internal groups may also reflect progress.</i>	
3.4.5 Disseminate reports to appropriate parties	<i>Electronic or hard copy reports noting deployment status are disseminated on a regular basis to external</i>	

	<i>and internal groups for advisement purposes.</i>	
3.4.6 Provide feedback on the deployment to deployment planning	<i>Feedback from external and internal groups are collected and tracked. This may be via reports, meetings, surveys, etc.</i>	

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>Policy regarding deployment and the synchronized efforts of other process areas is established and followed.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>All deployment personnel have access to software tools, schedules, and feedback necessary in order to complete their tasks.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>Training policy is in place for new deployment personnel regarding, procedures, technologies, software, etc. Organization wide customers are aware of the capabilities within the deployment group.</i>	
	GP2.4 Collect data to measure performance	<i>Data are collected, for example: number of batch jobs per month, number of hours per batch job, etc.</i>	
	GP2.5 Maintain communication among team members	<i>Feedback might be collected via meetings and reports from physical planning and management regarding lead times.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>Deployment schedules are complete with all necessary data (e.g. lead time, external/internal groups effected, resources, etc.).</i>	
	GP2.7 Employ version control to manage changes to work products	<i>Approvals are gained on schedules to accommodate the latest issues noted on current deployment plan.</i>	

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an organization level	<i>There is one centralized Deployment plan vs. multiple plans throughout the company in compliance with policies and procedures.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>New employees receive training on the deployment process and subsequent new technologies, processes, software, etc. Future employment needs are also considered.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>Deployment schedule is always handled according to stated policy vs. ad hoc.</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>Deployment solicits and provides feedback from external and internal groups for issues/problems and changes that should be reflected on the schedule.</i>	

5

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client

Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Deployment plan is based on strategic business needs vs. industry standards.</i>	
	GP4.2 Automate data collection	<i>Metrics are automatically collected from the deployment schedule vs. collected manually</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>Metrics automatically collected by deployment personnel are analyzed and reported. Deployment software tool maybe linked to physical site management schedule and might reflect scheduling conflict via e-mail message.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>Deployment is evaluated against performance goals and metrics for suggested improvements and revisions to the process.</i>	

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>Deployment issues are continuously improved via incremental changes, for example: e-mail survey information may be collected from external and internal parties for phase one of four vs. hard copy surveys.</i>	
Process Change	GP 5.1: Deploy “best practices” across the organization	<i>Process improvement noted in 5.1 example is validated via metrics and business goals, for example: by collecting data via e-mail survey 20% more external responses were received which decreased deployment planning for phases two – four by 30%.</i>	

Process Capability Assessment Instrument: Interview Guide

5

Process Area	3.4 Deployment
--------------	----------------

Questions
Base Practice: 3.4.1 Confirm schedule with all key groups periodically
Does the deployment schedule include rollout dates, software verification, training time, backout strategy, physical site preparation, locations, numbers and type of customers involved, either internal and/or external?
What is the procedure for identifying, assigning, and defining responsibilities and schedules to key internal and external deployment groups? Is this being done? How often are people re-assigned different responsibilities based on schedules and need?
How often are meetings set with internal and/or external groups to discuss deployment activities?
What avenues are available to internal/external groups to communicate and provide feedback regarding deployment activities (e.g. meetings, video/conference calls, hardcopy, email, etc.) ?
Base Practice: 3.4.2 Determine whether schedule will be impacted based on issues or problems that arise
Is lead-time provided to internal/external groups so they may evaluate any issues or problems? If yes, how long?
Are required resources (e.g. personnel, time, software, hardware, etc.) reviewed individually for deployment schedule purposes? What resources do you take into consideration?
Who is responsible for collecting internal/external group responses regarding deployment issues? Is this communicated to all stakeholders?
Base Practice: 3.4.3 Change deployment schedule as necessary to accommodate issues/problems
Have deployment schedules been changed to reflect issues and problems from

stakeholders? If so, please describe how?
In the past, what have been the reoccurring problems and issues considered by the deployment schedule?
Do the deployment schedules allow time for “catch-up” or recovery time for deployment errors?
Base Practice: 3.4.4 Report on progress of deployment plan
How are audits performed regarding rollout activities and reported? Are adequate resources provided for this task?
What mode of communication is used to distribute reports? How often?
Are qualified /quantifiable deployment milestones determined and reported to all internal/external groups?
Are customers provided with a contact person to communicate progress/issues/problems (e.g. service desk personnel, deployment contact)?
What data is collected and reported upon with deployment?
Base Practice: 3.4.5 Disseminate reports to appropriate parties
1. Who receives reports noting progress/success/failures/concerns about deployment?
2. How often are these report disseminated to internal/external stakeholders?
Base Practice: 3.4.6 Provide feedback on the deployment to deployment planning
Do other departments monitor and respond to deployment feedback? If so, whom and what type of feedback do you receive?
How does the deployment team/personnel receive feedback from stakeholders (e.g. through service desk request tickets, deployment public mailbox, etc.)?
Is this information tracked and used for current and future deployment ease and troubleshooting?
Generic Questions for Process Area
Is training provided that reviews the deployment process/procedure? If yes, describe the training.
Is training provided for all customers effected by the deployment? If yes, describe the training.
Are the deployment activities and processes monitored for continuous improvement? If yes, how?
Have any changes been enacted and validated after they have been identified as a continuous improvement area?

Process Capability Assessment Instrument

Process Area	3.4 Deployment
Process Area Description	Deployment monitors the rollout schedule against the activities taking place to ensure that rollout happens smoothly according to the planned schedule. As there are many dependencies within a distributed system, deployment can become highly complex and must be synchronized. In addition, numerous groups within and external to the organization will be involved in the

	rollout. Deployment is responsible for managing these groups, coordinating the information received from these groups, and determining whether or not the schedule will be negatively impacted by any activity taking place. If changes to the schedule are required, Deployment is responsible for coordinating the changes across all of the groups involved and seek management approval for the changes.
--	--

Questionnaire

5

Process Area	3.4 Deployment
--------------	----------------

		Yes	No	Don't Know	N/A
1	Are deployment schedules confirmed with all key groups periodically?				
2	Are deployment schedules sometimes impacted by problems that arise with other networking functions or business issues?				
3	Is the deployment schedule changed to accommodate issues/problems?				
4	Are reports generated which provide information on the deployment progress?				
5	Are reports disseminated to the appropriate external and internal parties?				
6	Is feedback provided to deployment planning personnel regarding the deployment process/progress?				

Work Product list

10

Process Area	3.4 Deployment
--------------	----------------

Example of a previous deployment plan

Example of training schedule/materials that was provided to employees who recently received deployed application

15

Example of a previous deployment reports

A copy of the standard procedures regarding deployment

Example of a backout strategy if deployment is not successful

20

Software & Data Distribution (3.5)

PA Number	3.5
PA Name	Software & Data Distribution
PA Purpose	The Software and Data Distribution process allows software and data to be installed or updated on hosts, servers and workstations providing customers with new and improved system functionality. Distributed architectures require compatibility between software and data on the various machines within the system and, at times, across different platforms (e.g., MVS host and Windows clients). Updates therefore must be carefully planned, synchronized, executed and, if necessary, regressed.
PA's Base Practices	Identify Architecture appropriate for environment Identify Architectures Per Business Process Detailed Design
PA Goals	To deliver new products or services to existing sites on time based on the rollout schedule.
PA's Metrics	Total number of batch rollouts scheduled per month Number of hours used per month for rollouts % of time that rollout schedule is successfully adhered to Ratio of emergency versus planned changes

Base Practices

BP Number	3.5.1
BP Name	Identify Architecture appropriate for environment

BP Description	The purpose of this activity is to identify which architecture(s) may be useful in the given environment(s) topology. There are several different options to chose from, including push, pull, diskette, stage and switch, phased, domino, and split and share.
Example	<i>An example of a push technology would be Microsoft's Systems Management Server (SMS). In an SMS environment an upgrade or patch can be distributed and executed without customer intervention. This can be very handy in an environment that the customers of the system are reluctant to perform upgrades or do not have time to run upgrades. SMS would allow you to run the upgrade during the evening or other down time.</i>
BP Number	3.5.2
BP Name	Identify Architectures Per Business Process
BP Description	The purpose of this activity is to determine which of the architectures that have been identified can be used depending upon the business process requirements. Different business processes will have different requirements. Once the architectures have been identified for the locations and business processes within the locations, the detailed process design stage can be started.
Example	<i>An example of two different architectures that would work for two different business processes would be batch verses online. In a billing environment data can be processed in a batch mode overnight, but in a telephone sales scenario an online environment would work best to give immediate information regarding availability.</i>
BP Number	3.5.3
BP Name	Detailed Design
BP Description	The detailed process design phase should be technology independent. The purpose of this activity is to integrate the existing and new technology into the strategic software distribution process.
Example	<i>The detailed design phase also includes the identification of interfaces to other operational process areas, such as asset management, SLA Management, Event Management, and Reporting.</i>

References

	MODE v2
	MODE v1 Toolkit

- 5 Process Area: Software & Data Distribution
Level 1
Assessment Indicators: Process Performance
Generic Practice: Ensure that Base practices are performed

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
3.5.1 Identify architecture appropriate for environment	<i>The quarterly reports for sales will be distributed using push architecture. Phased software distribution will take place for the new software. Software and data distribution personnel can identify an architecture for each distribution.</i>	
3.5.2 Identify architectures per business process	<i>On-line processing is used with new software. Software and data distribution personnel can identify which business processes are used.</i>	
3.5.3 Detailed Design	<i>A detail design shows overlap into other process areas (e.g. SLA Management, Event Management, Reporting, etc). Reports/issues/problems are identified between process areas and noted by personnel when asked.</i>	

10 Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators
-------------------	------------------	---------------------------------	-----------------------

			at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>A policy that would cover the software distribution of an application, patch or upgrade and is followed.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>Software copies are ordered and personnel have been assigned distribution tasks.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>Training policy is in place for new software and data distribution staff. Organization wide, customers are aware of the capabilities of software and data distribution.</i>	
	GP2.4 Collect data to measure performance	<i>Data are collected, for example: total number of batch rollouts scheduled per month, number of hours used per month for rollouts, etc.</i>	
	GP2.5 Maintain communication among team members	<i>Status reports noting issues/scope of change are forwarded to customers and departments. Feedback via meetings, report, etc. is collected.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>A complete copy of the detailed design plan available.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>A change control document referencing overlapping department being notified of distribution and related documents being updated accordingly.</i>	

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an organization level	<i>Software and data distribution is always handled according to the stated policy vs. ad hoc.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>Users email, confer, report back to software and data distribution personnel about reports they have been copied on and impact them.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>Software and data distributions are performed by one department within the organization.</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>New employees within the software and data distribution group received training on the process. Subsequent process changes for distribution are noted to all distribution staff within training, meetings, videoconferencing, etc. Future employment needs are considered.</i>	

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Software and data distribution is based on strategic business needs vs. industry standards.</i>	
	GP4.2 Automate data collection	<i>Metrics are automatically collected from the distributed network vs. manually collected.</i>	

	GP4.3 Provide adequate resources and infrastructure for data collection	<i>Software and data distribution is tracked via a remote diagnostic tool that allows the administrator, for example, to perform remote troubleshooting of workstations and servers on the network. Problems can be solved without visiting each machine and analysis can be rendered.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>Completed software and data distribution processes are evaluated against performance goals and metrics for suggested improvements and revisions to the process.</i>	

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>Software and data distribution continuously improved via incremental changes, an example: push architecture might be identified as better for small patches vs. upgrades.</i>	
Process Change	GP 5.1:Deploy “best practices” across the organization	<i>Process improvement noted in 5.1 example is validated via metrics and business goals, for example: it improved ease of installation, shorter downtime by 10% and fewer service calls from customers.</i>	

Process Capability Assessment Instrument

5

Process Area	3.5 Software & Data Distribution
Process Area Description	The Software and Data Distribution process allows software and data to be installed or updated on hosts, servers and workstations providing customers with new and improved system functionality. Distributed architectures require compatibility between software and data on the various machines within the system and, at times, across different platforms (e.g., MVS host and Windows clients). Updates therefore must be carefully planned, synchronized, executed and, if necessary, regressed.

Questionnaire

10

Process Area	3.5 Software & Data Distribution
---------------------	---

		Yes	No	Don't Know	N/A
1	When planning for software and/or data distribution are different architectures (e.g. push, pull, stage, switched, phased) identified before the actual distribution?				
2	When planning for software and data distribution, are different business processes taken into consideration?				
3	When planning for software and data distribution, is integration with existing and new technologies taken into consideration?				

Work Product list

15

Process Area	3.5 Software & Data Distribution
---------------------	---

- 5 Example of Software Performance Evaluation
- Example of "Manual" Distribution Package sent to User's.
- Example output of Software/Data Distribution Reports (Successes/Failures/etc.)
- Example of Asset Inventory Report for Software/Data Distribution
- Current copy of Detailed Design Plan
- Example of Change Control Document

Migration Control (3.6)

PA Number	3.6
PA Name	Migration Control
PA Purpose	Migration Control is the process of testing updates to the distributed system prior to being released into the distributed environment. To control the updates as they move from the development into the production environment, Migration Control ensures that the proper updates are: received from development versioned according to the version strategy of Release Planning moved into the test environment moved from the test environment into the production environment after the pre release tests have been successfully completed.
PA's Base Practices	Assemble the release package Maintain integrity of all master release packages Implement version control on release received from development Migrate proper versions of release from development to test environment Receive confirmation that release package has been tested successfully Notify appropriate parties of status of release package's migration Maintain migration libraries
PA Goals	To effectively migrate a release through the various environments (development to test, test to production). To ensure proper version of a release is migrated.
PA's Metrics	Percentage of migrations delivered on time Number of components incorrectly moved

10

Base Practices

BP Number	3.6.1
BP Name	Assemble the release package
BP Description	The purpose of this activity is to bundle the requirement components of a release, and ensure that it is correct and complete.
Example	<i>Assurances are made that the tools, testing, software, space and version control is in place before a package is released.</i>
BP Number	3.6.2
BP Name	Maintain integrity of all master release packages
BP Description	This activity ensures that the changes in the enterprise environment are synchronized in order to ensure a successful change/release.
Example	<i>Master releases should be processed from development, testing to production in a like manner to ensure integrity of all releases.</i>
BP Number	3.6.3
BP Name	Implement version control on release received from development
BP Description	The purpose of this activity is to ensure that the multiple entities which make up the release package are versioned and controlled.
Example	<i>Version control on releases allows for software to be documented thoroughly. Change requests, environment, description, responsible programmer, migration date, problems and status should be noted for all versions via Change Control personnel.</i>
BP Number	3.6.4
BP Name	Migrate proper versions of release from development to test environment
BP Description	Completion of this activity will ensure that a version control mechanism has been invoked on migration contents. Version and migrate fixes from the development to test environment as necessary.

Example	<i>The actual migration takes places to testing only after all fields within noting required version control document have been approved and are complete.</i>
BP Number	3.6.5
BP Name	Receive confirmation that release package has been tested successfully
BP Description	Completion of this process will ensure that tested release packages are stored prior to release.
Example	<i>Releases will be tested and confirmation will be noted on the version control documents as to the tester, status, comments, etc. Dates will be assigned and the release stored until its actual deployment.</i>
BP Number	3.6.6
BP Name	Notify appropriate parties of status of release package's migration
BP Description	This activity will ensure that access to tested release for distribution to production environment is available to those who require access.
Example	<i>Multiple releases can be dependent and need to be deployed in sync. Users, programmers and other departments should be informed. Deployment and/or Software & Data Distribution personnel are notified of the release status so they can schedule appropriately for possible system unavailability, etc.</i>
BP Number	3.6.7
BP Name	Maintain migration libraries
BP Description	The purpose of this activity is to ensure housekeeping is performed on migration libraries.
Example	<i>Libraries are maintained for roll-back and back-up purposes. This ensures that copies of releases are available for any future use along with supporting documentation that thoroughly describes changes, status, programmers and owners of release.</i>

References

	MODE v1 Toolkit
	MODE v2

- 5 Process Area: Migration Control
 - Level 1
 - Assessment Indicators: Process Performance
 - Generic Practice: Ensure that Base practices are performed

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
3.6.1 Assemble the release package	<i>Release packages are assembled/complete from development. Hardcopy or electronic checklist is available for bundle requirements. When questioned, personnel can explain tools used, procedures for and policies on assembling release packages.</i>	
3.6.2 Maintain integrity of all master release packages	<i>Changes to the environment are synchronized so that all master release packages are complete and are also referenced on the release management schedule. Personnel are aware of importance and location of master copies.</i>	
3.6.3 Implement version control on release received from development	<i>Version control is maintained on software entities. Electronic form or report indicates version control number.</i>	
3.6.4 Migrate proper versions of release from development to test environment	<i>Checks are in place to validate that correct versions of fixes and releases have been processed from development into the testing environment. Tracking report notes migration progress/status. Personnel provided with copy or access to report.</i>	
3.6.5 Receive confirmation that release package has been test	<i>Confirmation is received that a release package has been tested successfully. Personnel receive e-mails</i>	

successfully	<i>of test completion.</i>	
3.6.6 Notify appropriate parties of status of release package's migration	<i>Other parties are notified of the migration status regarding a release package.</i>	
3.6.7 Maintain migration libraries	<i>Migration libraries are maintained.</i>	

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>Standard procedure exists for migration control, whether it is a patch/fix or new software and it is followed.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>Migration control personnel have access to software tools, code, systems, and material in order to complete the process.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>Training policy is in place for new migration control staff. Organization wide, customers are aware of migration control and their capabilities.</i>	
	GP2.4 Collect data to measure performance	<i>Data are collected, for example: number of migrations per month, number of migrations into testing, etc.</i>	
	GP2.5 Maintain communication among team members	<i>Status reports covering migration control schedules, issues/problems tracked and updates are provided to other process areas, customers, programmers, etc.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>All applicable software, approvals, space, and systems are considered when completing the migration control schedule and subsequent proces.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>The migration control process places version control on software when transferred into a new environment which is documented and reviewed on a regular basis.</i>	

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an organization level	<i>Migration control is always handled according to the stated policy vs. ad hoc.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>Validation, Change Control, Deployment and the Software/Data Distribution groups have provided feedback to Migration Control via e-mail, reports, and meetings regarding changes, concerns or issues.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>There is one migration control group that is responsible for migration vs. independent groups using different methods and procedures.</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>Migration control personnel receive new training and subsequent training that reviews new technologies, process, systems, etc. Future employee requirements are addressed.</i>	

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Addressing and responding to migration control issues based on strategic business needs vs. industry standards.</i>	
	GP4.2 Automate data collection	<i>Metrics are automatically collected from migration control vs. a manual collection, for example: % of time a migrated piece is in testing, % of roll-backs a month that are patches, etc.</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>Metrics are collected by migration control personnel are analyzed and reported. Migration tools are tied to validation, in the event testing is complete, migration reports will be updated with completion date.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>Migration control is evaluated against performance goals and metrics for suggested improvements and revisions to the process.</i>	

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and process	<i>Migration control is continuously improved via incremental changes, an example: Adding a comments section to the Order Entry migration tracking report.</i>	
Process Change	GP 5.2: Deploy “best practices” across the organization	<i>Process improvement noted in 5.1 example is validated via metrics and business goals, for example: programmers provided with value added information decreased testing time by 3% and decreased Order Entry down time 5%.</i>	

5 Interview Guide

Process Area	3.6 Migration Control
--------------	-----------------------

Questions
Base Practice: 3.6.1 Assemble the release package
Are tools, software, space and version controls always in place to secure a complete and bundled release? If yes, who does this and how? If no, explain.
Who does migration control coordinate this process with (e.g. Change Control, Validation, Deployment, Software and Data Distribution, etc.)? Explain the interactions.
Base Practice 3.6.2 Maintain integrity of all master release packages
Are all master release packages maintained in their own file and directory structure? If no, explain.
Are all documents for the master release package archived/maintained? If yes, by whom (e.g. owners, developers, programmers, etc.) and are they accessible?
Base Practice: 3.6.3 Implement version control on release received from development
Is version control maintained on release software from development? If yes, how and who is responsible? How is feedback provided (e.g. reports, form provided, etc.)?
Is change control made aware of releases received from development? If yes, how? If no, explain.
Base Practice: 3.6.4 Migrate proper versions of release from development to test environment

Are versions validated to ensure that the correct versions of releases are migrated into the test environment? If yes, how and by whom?
Is validation made aware of release migration into the environment? If yes, how? If no, explain.
Base Practice: 3.6.5 Receive confirmation that release package has been tested successfully
How is confirmation received regarding successful testing? By whom and to whom is this information sent?
2. Are all schedules updated with this information? If yes, which ones. If no, why?
Base Practice: 3.6.6 Notify appropriate parties of status of release package's migration
How are other parties notified of release package's migration? Who would be the typical receivers of such information?
Do other parties supply feedback to migration control regarding concerns, problems or collaborative efforts? If yes, how is typical communication handled (e.g. e-mail, reports, meetings, etc.)?
Base Practice: 3.6.7 Maintain migration libraries
Are migration libraries maintained? If yes, by who and how? If no, explain how historical software or versions are kept?
2. How long are migration libraries maintained for?
Generic Questions for Process Area
Is there a formal policy in place that covers the entire migration control process? If yes, is it followed and who is responsible for its maintenance. If no, explain.
Is there training in place for new employees? If yes, explain the training provided (e.g. ad hoc, on the job, formal, lecture)? Is follow-up training provided on new technologies and procedures for all migration control employees? Explain.
Are data collected on the migration process? If yes, is this automated? Are metrics gathered noting more statistical information? If yes, explain what metrics are collected and what tools are used (e.g. software, programs, etc.).
Are strategic goals in place for migration control? If yes, what are they and are they measured against metrics? Are these metrics analyzed against business goals and reported on. If yes, how and by whom? If no, explain.
Is the migration control process reviewed for continuous improvement? If yes, are these improvements ever deployed and measured against metrics and business goals?
Are there enough resources provided for the migration control process (e.g. software, tools, personnel, etc.)? If no, explain?

Process Capability Assessment Instrument

Process Area	3.6 Migration Control
Process Area Description	Migration Control is the process of testing updates to the distributed system prior to being released into the distributed environment. To control the updates as they move from the development into the production environment, Migration Control ensures that the proper updates are: received from development versioned according to the version strategy of Release Planning moved into the test environment. moved from the test environment into the production environment after the pre release tests have been successfully completed.

5

Questionnaire

Process Area	3.6 Migration Control
--------------	-----------------------

10

		Yes	No	Don't Know	N/A
1	Are the release packages assembled from development complete?				
2	Are changes to the environment synchronized so that all master release				

	packages are complete and are also referenced on the Release Management schedule?				
3	Is version control maintained on software entities?				
4	Are checks in place to validate that correct versions of fixes and releases have been processed from development into the testing environment?				
5	Do you receive confirmation that a release package has been tested successfully?				
6	Are other parties notified of the migration status regarding a release package?				
7	Are migration libraries maintained?				

Work Product list

Process Area	3.6 Migration Control
--------------	-----------------------

5

- A copy of the policy or procedure guide regarding migration control
- Samples of changes requests noting migration control information
- Samples of reports noting migration control status and future schedules
- A copy of a migration control schedule/calendar for a typical software migration process

10

Repository Management (3.7)

PA Number	3.7
PA Name	Repository Management
PA Purpose	<i>Repository Management: Under Construction</i> <i>Relationships/Integrity:</i> <i>Configuration:</i> <i>Versioning:</i> <i>Documentation:</i>
PA's Base Practices	jasdklf; asdf asdf
PA Goals	
PA's Metrics	

Base Practices

BP Number	
BP Name	
BP Description	
Example	
BP Number	
BP Name	
BP Description	
Example	

References

	MODE v2
	MODE v1 Toolkit

15

Content Management (3.8)

PA Number	3.8
PA Name	Content Management
PA Purpose	Content Management represents the people, processes, and technologies that allow a net-centric site to maintain up-to-date, secure, and valid contents for its customers.
PA's Base	Content Development

Practices	Content Approval Content Integration Technical Review Content Testing Content Restoration Content Aging
PA Goals	To ensure up to date content on net-centric sites for customers To ensure secure content on net-centric sites for customers To ensure valid content on net-centric sites for customers To ensure that content meets business requirements.
PA's Metrics	Number of successful content approvals each month Average number of successful content migrations per month % of content that needs restoration Number of times per month that old content is archived and deleted

Base Practices

BP Number	3.8.1
BP Name	Content Development
BP Description	The process for the actual development of the content for the application including everything from static text to full-motion videos.
Example	<i>Formal procedure for content development has been established for voice and video content, etc.</i>
BP Number	3.8.2
BP Name	Content Approval
BP Description	The process by which content is approved. The approval process may be different depending on where the content was generated.
Example	<i>For example, marketing content may need to be reviewed by the marketing manager and a representative from the legal department. The process for content types from each organization should be a clear approval process before it can be integrated.</i>
BP Number	3.8.3
BP Name	Content Integration
BP Description	The content integration process involves the steps required to take approved, developed content and migrate it into the production environment.
Example	<i>The process may include archiving the existing content if it is being replaced, the use of a staging server, integration testing, etc</i>
BP Number	3.8.4
BP Name	Technical Review
BP Description	This activity ensures that proper technical aspects of a content management solution are in place
Example	<i>Technical standards and procedures HTML tags Links</i>
BP Number	3.8.5
BP Name	Content Testing
BP Description	The content testing process should include the steps necessary to validate that content is adequately tested and ready for general use. This process may be done both before and after content integration. It is important to test the content in a range of sample environments to ensure that there are no abnormalities within certain environments.
Example	<i>A particular web page may be loaded on a standalone system and a network to see if the different hardware and software configurations of these two environments affects page content (e.g. video, voice, links, etc.).</i>
BP Number	3.8.6
BP Name	Content Restoration
BP Description	In cases where portions of a web site's content must be replaced with older versions, the site may encounter issues such as broken links. Content Management processes will need to consider how content is restored and tested to ensure that these issues are avoided.
Example	<i>Strategies to address this may include restoring portions of a web site versus single pages, or</i>

	<i>restoring older versions of the entire site.</i>
BP Number	3.8.7
BP Name	Content Aging
BP Description	The process of identifying content that needs to be removed from the application and what should happen to it when it is removed.
Example	<i>Options include archiving the old content, versioning it such that new content is simply a new version of the old content, or simply deleting it. It is important, however, to keep the content within the application as current as possible and to remove stale data regularly.</i>

References

	MODE v2
	MODE v1 Toolkit
	NetCentric Designers Guide – Content Management

- 5 Process Area: Content Management
 Level 1
Assessment Indicators: Process Performance
Generic Practice: Ensure that Base practices are performed

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
3.8.1 Content development	<i>A formal procedure for content development has been established. Content management personnel are familiar, when asked, with procedures and standards for content.</i>	
3.8.2 Content approval	<i>Content management personnel are aware of a formal approval process and can relay that process to the interviewer.</i>	
3.8.3 Content integration	<i>When questioned, personnel can explain process for migrating content into production environment.</i>	
3.8.4 Technical review	<i>Technical reviews are performed regarding content to ensure all requirements (e.g. links, tags) are in place. Notes from the review session are available.</i>	
3.8.5 Content testing	<i>Content is tested in various environments/platforms (e.g. unix vs. pc) for performance problems and issues. Test plans for content management testing are available.</i>	
3.8.6 Content restoration	<i>When questioned personnel can explain procedure for identifying content for removal and archive location.</i>	
3.8.7 Content aging	<i>There is a procedure for identifying content for removal and archive location. Time table is set-up for removal.</i>	

- 10 Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing the process	<i>A policy that would cover content management from end-to-end and is followed.</i>	
	GP2.2 Allocate adequate resources for performing the process	<i>Software tools, languages, equipment and personnel are available for content management tasks.</i>	
	GP2.3 Ensure adequate people skill	<i>Training policy is in place for new content management personnel. Organization wide, customers are aware of content management's capabilities.</i>	

	GP2.4 Measure process	<i>Data are collected, for example: number of successful content approvals each month, average number of successful content migrations per month, etc.</i>	
	GP2.5 Coordinate and communicate	<i>Status reports noting problems/concerns are forwarded to authors, content management and the web master. Feedback is provided via e-mail, meetings, etc.</i>	
Work Product Management	GP2.6 Verify adherence of work products to the applicable requirements	<i>A completed tracking document or report showing the progression of a web page throughout the entire content management process.</i>	
	GP2.7 Manage the configuration of work products	<i>Version control has been established on all web pages and change control documents are produced referencing any overlapping departments (e.g. marketing, legal, etc.).</i>	

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Perform the process according to a defined process	<i>Content management is always handled according to the stated policy vs. ad hoc</i>	
	GP3.2 Provide feedback	<i>Authors and customers report back to content management about reports they have received and results that impact them.</i>	
Process Resource	GP3.3: Define and establish adequate process infrastructure	<i>All web documents are processed through content management prior to migration in a production environment</i>	
	GP3.4 Provide adequate human resource competencies	<i>New employees within the content management group receive training on the process. New processes and technologies are handled in subsequent training sessions. Future staff requirements are addressed.</i>	

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the services of the operations environment's standard and defined processes	<i>Content management is based on strategic business needs vs. industry standards.</i>	
	GP4.2 Determine the quantitative process capability of the defined process	<i>Metrics are automatically collected from the network vs. manually.</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>Metrics are collected, for example, regarding hits per page and peak usage via automated software program. Software tools are tied to another process area, for example: content management's readiness to migrate into production would automatically update a</i>	

		<i>migration report</i>	
Process Control	GP4.4 Use the quantitative process capability to manage the process	<i>Content management is evaluated against performance goals and metrics for suggested improvements and revisions to the process.</i>	

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve process	<i>Content management is continuously improved via incremental changes, an example: weekly content management meeting is held instead of monthly to discuss problems/threats.</i>	
Process Change	GP 5.2: Deploy “best practices” across the organization	<i>Process improvement noted in 5.1 example is validated via metrics and business goals, for example: resolution of identified problems is quicker by 12 days and 3% decrease needed restorations required.</i>	

Process Capability Assessment Instrument: Interview Guide

5

Process Area	3.8 Content Management
--------------	------------------------

Questions
Base Practice: 3.8.1 Content Development
Are meetings held to discuss verbal and graphical content of each application? If yes, who attends? How often are these meetings held?
Is a web template used to standardize information and aesthetics for every application? Who developed the template? Is there a purpose for its specific design?
Has a standardized list of approved text, image and multi-media formats been agreed upon? If yes, what are they? What was the process of composing this list?
Is there a procedure/policy regarding the content development? If yes, what is the procedure? Is the procedure followed?
Base Practice: 3.8.2 Content Approval
1. Is there a procedure for content approval? If yes, what is it?
Who reviews content for approval purposes? If yes, whose concerns do they represent (e.g. legal, marketing, engineering, etc.)?
Are meetings held on a scheduled basis for content approval matters? If yes, who attends?
4. Is version control established for all web related documents?
Base Practice: 3.8.3 Content Integration
1. Who is responsible for migrating documents into the production environment? Is migration performed on an ad-hoc bases or on a scheduled basis? What is the process for migrating documents?
How is old or outdated material archived/stored when new data is migrated onto the system to replace it?
Base Practice: 3.8.4 Technical Review
Are technical standards and procedures established for content review? If yes, what are they? Who conducts these reviews?
How are technical problems/concerns reported to the author, customers, content management or the web master (e.g. meetings, reports, e-mails)? Does Content Management coordinate an action plan/corrections with the author (e.g. scheduled, prioritized, ad hoc, etc.)?
What are the most common technical problems encountered? What are the future technical threats or issues to be considered? How are these problems fixed or resolved?
Base Practice: 3.8.5 Content Testing

1. Is the content tested before or after it is integrated into the production environment?
When testing content, which environments/platforms are checked for problems/issues (e.g. unix, standalone, network)?
Who is responsible for testing? How is feedback provided from and to content management, customers, authors, web masters, etc.?
Base Practice: 3.8.6 Content Restoration
Has any part or all of an archived web site ever been migrated into a production environment? If yes, explain the reason?
Who handles content restoration? What are the most common problems encountered when replacing current pages with older versions?
Is there an approval procedure as to what is restored and when? If yes, what is the process?
Base Practice: 3.8.7 Content Aging
Does the web site contain date sensitive/volatile content that must be updated often? If yes, how often and by whom?
Is the site checked for relevant and current information on a scheduled basis? If yes, by whom? How frequently does such a check occur?
Are files removed from a site (e.g. erased, archived), updated to include historical information/content or both? Is content volume an issue?
Are metrics gathered regarding content management? If yes, explain what data is gathered, why, and who is it distributed to?
Generic Questions for Process Area
Is a policy established, maintained and followed for the entire content management process? If yes, please describe it.
Are there enough personnel available in content management to perform all necessary tasks and manage the different types of contents (video, voice, etc.)? If no, why?
Is training provided for new content management personnel? If yes, how is it performed (e.g. on the job, scheduled, ad-hoc)?
Is formal training provided on a continuous basis for all content management personnel? If yes, describe training.
Are metrics collected? Is software used to perform metric collection on an automated basis? If yes, what program are used? What data is being collected?
Is the content management process reviewed for continuous improvement? If yes, is this process measured? How?
Are all documents processed through the content management personnel prior to migration in a production environment? If no, why?
Are strategic goals established for content management? Are these measured? If yes, how?
Is the content management process compared against goals and metrics? Do these comparisons lead to suggested improvements for the process? Are deployed improvements then validated via metrics?
Does content management lack any resources that are needed to perform tasks and follow procedure? If yes, what ?

Process Capability Assessment Instrument

Process Area	3.8 Content Management
Process Area Description	Content Management represents the people, processes, and technologies that allow a net-centric site to maintain up-to-date, secure, and valid contents for its customers.

5

Questionnaire

Process Area	3.8 Content Management
--------------	------------------------

		Yes	No	Don't Know	N/A
1	Is there a formal procedure for content development?				
2	Is there a formal procedure for content approval?				
3	Does the content management personnel migrate content into the production environment?				

4	Are technical reviews performed regarding content to ensure all requirements (e.g. links, tags) are in place?				
5	Is the content tested in various environments for performance problems/issues?				
6	Are historical versions of web pages archived?				
7	Have any archived web pages been tested and restored?				
8	Is there a procedure for identifying content for removal and archive location?				

Work Product List

Process Area	3.8 Content Management
--------------	------------------------

- 5 Content Management Manual
- Example of any Content Management Reports
- Example of a web page that progressed through Content Management cycle
- Metrics collected for the Content Management process
- 10 Examples of tracking documents/reports noting the status of web pages throughout the Content Management process

License Management (3.9)

PA Number	3.9
PA Name	License Management
PA Purpose	License Management ensures that software licenses are properly maintained. This is especially important since organizations are legally bound to maintain license arrangements. These arrangements are complex and can be based on the number of copies, on the number of shared servers, on dates, etc.
PA's Base Practices	Acquire new/increased number of licenses Delete expired software and corresponding licenses Support various license types
PA Goals	To ensure software licenses are being maintained throughout the enterprise environment, and those license agreements are not being violated.
PA's Metrics	Customer to License Ratio Total Users per Package Average/Peak Concurrent Users per Package Peak Times of Day Break Down of Customer Types

15 Base Practices

BP Number	3.9.1
BP Name	Acquire new/increased number of licenses
BP Description	The purpose of this activity is to ensure that licenses are purchased, authorized, and tracked for software being used.
Example	<i>Forecasting new or additional software licenses for new employees can be based off of yearly reports and future company growth forecasting.</i>
BP Number	3.9.2
BP Name	Delete expired software and corresponding licenses
BP Description	The purpose of this activity is to identify expired licenses of software that is no longer needed, ensure that the software is removed, and ensure that there is no violation of license agreements.
Example	<i>Company is converting from WordPerfect 6.1 to Word 97. The licensing agreement with WordPerfect is about to expire. Once Word 97 is rolled out to the company a cleanup needs to be performed to removed Word Perfect 6.1 before the expiration date of the licensing agreement.</i>
BP Number	3.9.3
BP Name	Support various license types
BP Description	The purpose of this activity is to know if / when licenses expiration dates are getting close to

	being reached, and renew license requirements when due or remove the application associated with the expired license. In addition, all software should be searched and reviewed to ensure that it is licensed.
Example	<i>Some asset management software can track and give notifications when licenses are expiring. The notification can be set to provide a cushion of time to order or renew the license.</i>

References

	MODE v2
	MODE v1 Toolkit

5 Process Area: License Management
 Level 1
 Assessment Indicators: Process Performance
 Generic Practice: Ensure that Base practices are performed

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
3.9.1 Acquire new/increase number of leases	<i>When questioned, personnel can describe process used to acquire new software licenses.</i>	
3.9.2 Delete expired software and corresponding licenses	<i>Checks are conducted by license management for upcoming/expired licenses of software that is no longer needed. License management personnel can recount the steps needed to audit software and remove expired software.</i>	
3.9.3 Support various license types	<i>Notification is made to license management when upcoming licenses will expire or checks are conducted to ensure current licenses.</i>	

10 Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>Policy for license management exists and is followed. Required licenses are acquired and maintained across the organization. Users are also aware that unlicensed software is against policy.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>License management personnel are able to track software and documented license agreements for the entire organization.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>Training policy is in place for new staff members. Organization wide customer are aware of licensed software that is available and/or required.</i>	
	GP2.4 Collect data to measure performance	<i>Data are collected, for example: customer to license ratio, % of expired licenses found, etc.</i>	
	GP2.5 Maintain communication among team members	<i>Feedback regarding issues are tracked from users and management are included in status reports. Feedback is collected via e-mails, meetings, etc.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>Report noting the following: software license agreements, software license purchases, expiration dates, and number of users resulting from a software tracking program.</i>	

	GP2.7 Employ version control to manage changes to work products	<i>The most recent software tracking reports are always reviewed because they are under a version or release control number.</i>	
--	--	--	--

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an organization level	<i>License management is always handled according to the stated policy vs. ad hoc.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>Users email, confer, report back to license management regarding expiration issues and software requirements for specific projects, etc.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>License management is performed by one centralized department within the organization.</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>Policy and process changes for license management are noted to personnel within training, meetings, videoconferencing, etc. Future employment needs are considered.</i>	

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>License management is based on strategic business needs vs. industry standards.</i>	
	GP4.2 Automate data collection	<i>Metrics are automatically collected from the various systems and administration tools vs. manually.</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>License management is tied to SLAs/OLAs and asset management reporting. Adequate resources are in place to analyze and report on license management.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>License management is revised after reviewing actual data on a software removal that occurred due to license expiration.</i>	

5

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and process	<i>License management is continuously improved via incremental changes, an example: 60 and 30 day broadcasts on software expiration may lead to easier transition instead of 30 day broadcast only.</i>	
Process Change	GP 5.2: Deploy “best practices” across the organization	<i>Process improvement in 5.1 example is validated via metrics and business goals: less down time will be spent trying to update software for users of expired applications and the % of users transferred over to other software offerings prior to expiration date will increase.</i>	

Process Capability Assessment Instrument: Interview Guide

5

Process Area	3.9 License Management
Questions	
Base Practice: 3.9.1 Acquire New/Increased Number of Licenses	
How are new/increased number of licenses acquired? By whom?	
Are the software programs used authorized by the original manufacturer? If no, explain?	
Are housekeeping duties performed on license information? If yes, when? How?	
Is the ability available to track, run detailed reports with version information, and measure the license management process regarding software licenses? If yes, how?	
Does license management authorize license use? If yes, how?	
Base Practice: 3.9.2 Delete expired software and corresponding licenses	
Is there a process in place for removing software with expired licenses? If yes, what is the process? How often does this occur?	
Are there any reports or data collected on software where the license has expired? If so, what detailed information is collected on the expired software? What is done with the data?	
Base Practice: 3.9.3 Support Various License Types	
1. Are various license types supported? If yes, identify?	
How are license renewals handled? By whom?	
Are notices sent when license expiration dates are near? If yes, how is notification sent?	
Is unlicensed software searched for? If yes, how (physical, system)?	
What is done when unlicensed software is discovered?	
Generic Questions for Process Areas	
What is the license management process?	
2. Are reviews for the license management process conducted for continual improvement?	
3. If improvements are implemented, how are the outcomes measured?	
4. What training is provided to new and existing personnel regarding the license management process?	
5. What license management reports are generated to management for review/feedback?	
6. What policy, standards or procedures have been established for license management?	
7. What are the needs, priorities and quantitative goals for license management?	
8. Are any resources lacking that would facilitate data collection regarding license management?	

Process Capability Assessment Instrument

Process Area	3.9 License Management
Process Area Description	License Management ensures that software licenses are properly maintained. This is especially important since organizations are legally bound to maintain license arrangements. These arrangements are complex and can be based on the number of copies, on the number of shared servers, on dates, etc.

10

Questionnaire

Process Area	3.9 License Management
--------------	------------------------

		Yes	No	Don't Know	N/A
1	Do you track software licenses?				
2	Is there a process for acquiring new or additional software licenses?				
3	Are various license types supported?				
4	Do software searches and reviews take place to ensure current licenses are being held?				
5	Does license management authorize license use?				

5 Work Product list

Process Area	3.9 License Management
--------------	------------------------

- Sample Software License Agreement
- Sample of Software License Purchases
- 10 List of available software with details (expiration date, number of customers, etc.)
- Customer’s Guide for Software Tracking Program

Asset Management (3.10)

PA Number	3.10
PA Name	Asset Management
PA Purpose	Asset Management ensures that all assets are registered within the inventory system and that detailed information for registered assets is updated and validated throughout the asset’s lifetime. This information will be required for such activities as managing service levels, managing change, assisting in incident and problem resolution and providing necessary financial information to the organization.
PA’s Base Practices	Manage and maintain asset information Audit information in system Report on discrepancies Archive asset information Log all assets in inventory
PA Goals	To gather and maintain asset information to assist in incident and problem resolution. To utilize auto discovery capabilities within asset management, to aid in the notification of new device implementation. Provide an easy way to store version information about devices and software/data on a machine.
PA’s Metrics	Percentage of incorrect asset data The difference between the prices paid and budgets for particular items Percentage of requested products delivered on time The cost of business items purchased unnecessarily or incorrectly

15

Base Practices

BP Number	3.10.1
BP Name	Manage and maintain asset information
BP Description	Update and delete asset information locally or remotely. The purpose of this activity is to ensure that asset information is accurate.
Example	<i>Software packages, such as ValuWise, can allow an Asset Management team to maintain a database with what assets are assigned to whom.</i>
BP Number	3.10.2
BP Name	Audit information in system
BP Description	Periodic audits of the asset management system should be performed to ensure accuracy of data.
Example	<i>Periodic functional testing is performed to verify that all assets are registered and that system updating and archiving works effectively. In addition, a stress test is performed to ensure that the system is able to handle multiple customers and interfaces simultaneously.</i>
BP Number	3.10.3
BP Name	Report on discrepancies
BP Description	In order to ensure accurate data, asset reports should be produced according to customer defined criteria. Reports need to be formatted for the correct audience and then distributed.
Example	<i>Reports are generated to present the results of the audit of the asset management system. Appropriate parties are notified to deal with any discrepancies.</i>
BP Number	3.10.4
BP Name	Archive asset information

BP Description	Asset information should be archived for historical tracking and documentation
Example	<i>All pertinent information (such as moves, changes and additions) collected about particular assets is stored for future reference.</i>
BP Number	3.10.5
BP Name	Log all assets in inventory
BP Description	This activity ensures that the necessary quantities of equipment (hardware and software) are entered into the asset management system correctly, and in a timely manner.
Example	<i>Software packages, such as ValuWise, can not only track the assets that are assigned to people, but can track the number of assets in inventory and the assets that are on order.</i>

References

	MODE v2
	MODE v1 Toolkit

- 5 Process Area: Asset Management
- Level 1
- Assessment Indicators: Process Performance
- Generic Practice: Ensure that Base practices are performed

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
3.10.1 Manage and maintain asset information	<i>A software package (e.g. ValuWise) is utilized to store and update information on all assets.</i>	
3.10.2 Audit information in system	<i>Test results of an audit of the asset management system is available and shows that a check was done to verify that the information contained corresponds to actual state of assets. When questioned, personnel can explain how the system is audited.</i>	
3.10.3 Report on discrepancies	<i>Reports on the audit process are available.</i>	
3.10.4 Archive asset information	<i>When questioned, personnel can describe the archival process for asset information.</i>	
3.10.5 Log all assets in inventory	<i>Procedures are in place to ensure that all assets in inventory are also logged in the asset management system.</i>	

10

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>A documented policy is maintained, that describes what asset information must be recorded, the frequency of updates and reporting requirements.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>The asset management tool is adequate given the volume and variety of assets tracked.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>Asset management personnel receive training on the asset management tool.</i>	
	GP2.4 Collect data to measure performance	<i>Data such as the following are collected: percentage of assets with inaccurate version information, percentage of assets in inventory not recorded in system.</i>	
	GP2.5 Maintain communication among team members	<i>The asset management team provides status reports to appropriate parties.</i>	

Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>Asset management reports are produced according to documented specifications for format and content.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>If multiple records for individual assets are maintained, mechanisms are in place to ensure changes/updates are applied to all.</i>	

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an organization level	<i>Channels exist for asset information to flow between asset management and relevant parties such as Service Desk, Procurement etc.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>Planning of future human resource needs occurs for asset management, given organization and related asset growth projections</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>Asset information is updated in accordance with documented policy on events and frequencies that should be logged.</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>The asset management team provides feedback on the asset management process at periodic meetings. Departments/projects provide feedback to asset management about content of reports received.</i>	

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Quantitative targets for assessing asset management performance are periodically set.</i>	
	GP4.2 Automate data collection	<i>All predefined asset management data and assessment metrics are collected.</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>Adequate staff is provided for manual checks to compare actual assets with information in the system.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>Assessment metrics collected are compared to targets and discrepancies addressed.</i>	

5

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>The asset management process and relevant technologies are periodically reviewed to identify potential enhancements. Actions are taken to implement improvements identified.</i>	
Process Change	GP 5.1: Deploy "best practices" across the organization	<i>All appropriate parties in the organization are informed of new/modified procedures aimed at improving the asset management process.</i>	

Process Capability Assessment Instrument: Interview Guide

5

Process Area	3.10 Asset Management
Questions	
Base Practice: 3.10.1 Manage and Maintain Asset Information	
What tool or system is used to maintain asset information?	
What attribute information is initially recorded about the assets? What types of updates are made, and how frequently?	
For what purposes is asset information used (e.g. financial reporting, managing service levels etc.)? How does the asset management system interface with the other functions (such as accounting) that need access to asset information?	
Does the tool enable detection and tracking of all hardware and software components installed on the network?	
Can asset information be updated/deleted/browsed remotely and/or locally?	
Base Practice: 3.10.2 Audit Information in System	
How is information in the system audited for correctness, completeness and accuracy?	
How frequently do audits occur?	
Can asset information be searched based on customer-defined parameters?	
Who is responsible for overseeing the audit process?	
Base Practice: 3.10.3 Report on Discrepancies	
What reports are generated based on discrepancies identified during the audit process? What information do these reports contain?	
Are the content and format of these reports based on documented standards?	
Who receives these reports and for what purposes?	
What action is taken if discrepancies are identified? Does the action depend on the severity of the discrepancy? Are these procedures documented?	
How frequently does this reporting process occur?	
Base Practice: 3.10.4 Archive Asset Information	
How long is asset information stored for? In what format and where is old asset information archived?	
For what purposes and how frequently is archived asset information accessed?	
Base Practice: 3.10.5 Log all Assets in Inventory	
How is it ensured that, in addition to assets in use, all assets in inventory are logged on the asset management system?	
What is the updating process when an asset in inventory is moved for use?	
Does the process for auditing informational accuracy cover assets in inventory?	
Generic Questions for Process Area	
Is the asset management tool/process periodically reviewed to identify potential improvements? If so, how frequently does this occur and who controls this process?	
How is performance of asset management functions measured?	
Are any performance targets (e.g. percent of incorrect asset data in system) for the asset management process defined? If so, what are they and how is performance assessed against these targets?	
Do you find that the existing asset management system adequately meets the organization's asset information needs?	
What type of relevant qualifications and training do asset management personnel have?	

Process Capability Assessment Instrument

Process Area	3.10 Asset Management
Process Area Description	Asset Management ensures that all assets are registered within the inventory system and that detailed information for registered assets is updated and validated throughout the asset's lifetime. This information will be required for such activities as managing service levels, managing change, assisting in incident and problem resolution and providing necessary financial information to the organization.

Questionnaire

5

Process Area	3.10 Asset Management
--------------	-----------------------

		Yes	No	Don't Know	N/A
1	Do you have an asset management system for maintaining information on all assets?				
2	Are periodic audits of the asset management system performed to ensure accuracy of the data?				
3	Are reports generated to present findings on the discrepancies between actual asset status and information in the system?				
4	Is asset information archived for historical tracking and documentation?				
5	Are all assets in inventory logged on the system?				

Work Product list

10

Process Area	3.10 Asset Management
--------------	-----------------------

Example list of assets and details related to each asset

Sample asset log

Audit reports

15

Discrepancy reports (if different from above)

Procurement (3.11)

PA Number	3.11
PA Name	Procurement
PA Purpose	Procurement is responsible for ensuring that the necessary quantities of equipment (both hardware and software) are purchased and delivered on time to the appropriate locations. Procurement is also responsible for logging all assets into the inventory as they are received.
PA's Base Practices	Maintain vendor information Receive and log request Identify vendor and place order Track orders Ensure timely/accurate delivery & log assets received Manage returns and replacements Report on procurement activities and assess procurement strategy
PA Goals	To procure and deliver assets on time and at the lowest possible cost. To maintain accurate vendor information. To ensure all assets purchased are entered into asset management system.
PA's Metrics	Differential between actual and budgeted equipment costs Percentage of requested items delivered on time Costs incurred from returns due to incorrect purchases

20

Base Practices

BP Number	3.11.1
BP Name	Maintain vendor information
BP Description	Information should be maintained and updated on the following: List of approved vendors (to avoid dependency on a single supplier, at least one alternative supplier should be identified for each required type of equipment) History of transactions with each vendor and the quality of service Special terms/conditions that apply to a vendor Existing contracts or regulatory requirements that might affect vendor selection

Example	<i>A catalogue is maintained that contains information on all suppliers that have had contacts with the organization. Information recorded includes names/addresses of contact-persons, negotiated payment terms and evaluative comments on the vendor's performance.</i>
BP Number	3.11.2
BP Name	Receive and log request
BP Description	On receipt, each request is logged with all required information. For each request received, procurement verifies that appropriate approval for the purchase has been obtained. For non-standard orders, the technical compatibility of the equipment requested is also verified.
Example	<i>A purchase data record is logged that contains information on item, amount, supplier, prices, technical specifications and dates.</i>
BP Number	3.11.3
BP Name	Identify vendor and place order
BP Description	Once a request has been approved and a purchase order generated, a suitable vendor is identified. Prices, terms and conditions are negotiated with the vendor and the order is placed. Order notification and an estimated delivery date is sent to the customer.
Example	<i>Any discounts, special terms and relationship impacts are considered in selecting the best supplier for a particular item. If no standing contract exists with the supplier, the order is negotiated and placed. A delivery date is decided on and appropriate parties informed are informed.</i>
BP Number	3.11.4
BP Name	Track orders
BP Description	Orders should be tracked to ensure delivery occurs on schedule, and vendors contacted if issues arise. A backlog and back order information is also maintained. If applicable, rollout/release management should be notified of delivery dates with sufficient lead-time for any necessary planning.
Example	<i>The tool used for managing the procurement process sends a signal to procurement personnel when an order is expected soon or is overdue, so that the order status can be verified with the vendor.</i>
BP Number	3.11.5
BP Name	Ensure timely/accurate delivery & log assets received
BP Description	This activity ensures that the necessary quantities of equipment (hardware and software) are delivered on time to the appropriate locations. All assets received are logged in the asset management system.
Example	<i>When a notification of delivery is received, procurement verifies satisfactory delivery with customer, and makes closing entry in procurement log. The purchased item and its attributes are then recorded in the asset inventory system, so that asset management can take charge.</i>
BP Number	3.11.6
BP Name	Manage returns and replacements
BP Description	This activity involves coordinating the return of rejected items or replacement of canceled orders. Reasons for rejection or cancellation should be documented and the costs of processing returns or replacements assessed.
Example	<i>Procurement is notified if a delivered item is rejected or canceled. If the item was defective and another piece is desired, procurement contacts the supplier. In the event of cancellation of a functioning item, procurement coordinates locating another use for it or storing the item in inventory.</i>
BP Number	3.11.7
BP Name	Report on procurement activities and assess procurement strategy
BP Description	Procurement should regularly report information such as items purchased, supplier performance and deviations from procurement plans. These reports are reviewed to identify beneficial modifications of the procurement strategy.
Example	<i>Monthly reports are produced to capture data on completed purchases and any problems, such as delays, unavailable items or changed prices. These reports are used by the procurement planning function to assess suppliers and procurement strategy.</i>

References

	MODE v2
	MODE v1 Toolkit

--	--

Process Area: Procurement

Level 1

Assessment Indicators: Process Performance

Generic Practice: Ensure that Base practices are performed

5

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
3.11.1 Maintain vendor information	<i>A detailed listing is available of all approved vendors along with information on prior transactions with them.</i>	
3.11.2 Receive and log request	<i>A log shows that all requests are logged on receipt.</i>	
3.11.3 Identify vendor and place order	<i>A procedure is in place to ensure that factors such as cost, regulations, etc. are considered in selecting a vendor for a particular item. Documented procedures are also followed in placing an order with a vendor.</i>	
3.11.4 Track orders	<i>Any issues involving open orders are logged.</i>	
3.11.5 Ensure timely/accurate delivery & log assets received	<i>Proactive measures, such as calling vendors to reconfirm delivery, are taken to ensure timely and accurate delivery.</i>	
3.11.6 Manage returns and replacements	<i>Documented policies on handling returns and replacements are available.</i>	
3.11.7 Report on procurement activities and assess procurement strategy	<i>Periodic reports are generated that summarize procurement activity and meetings are held to evaluate procurement strategy.</i>	

10

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>Policies and procedures have been defined for procurement activities like maintaining vendor information, placing an order and handling returns.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>Sufficient staff and information management resources are allocated to procurement so that information on all suppliers can be maintained and orders can be placed in a timely manner.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>Procurement personnel receive training and are familiar with all procurement-related policies and procedures.</i>	
	GP2.4 Collect data to measure performance	<i>Data are collected, for example: percentage of requested items delivered on time, costs resulting from incorrect purchases, differential between actual and budgeted costs.</i>	
	GP2.5 Maintain communication among team members	<i>Issues are tracked and logged. Members of the procurement team provide status reports.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>All required information is completed on purchase orders. Procurement reports follow predefined specifications on content and format.</i>	
	GP2.7 Employ version	<i>Any changes to purchase requests are</i>	

	control to manage changes to work products	<i>documented/logged.</i>	
--	---	---------------------------	--

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an organization level	<i>Channels exist that enable all purchases to occur through or communicated to the centralized procurement group.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>Projections of future staffing requirements for procurement are made.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>All predefined tasks are performed so that equipment is purchased at the lowest possible cost and deliveries occur in a timely manner.</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>User surveys or other methods are used to obtain feedback on the satisfaction with the performance of the procurement function. The procurement team provides feedback on the procurement process and strategy.</i>	

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Targets are regularly set for metrics assessing procurement operations.</i>	
	GP4.2 Automate data collection	<i>Data for assessment purposes are automatically gathered from the information entered for purchase orders and delivery receipts.</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>All data needed for assessment purposes are collected.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>Appropriate steps are taken to address discrepancies between actual procurement performance and the targets set.</i>	

5

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>New technologies to aid in procurement are evaluated and policies reviewed to identify potential improvements.</i>	
Process Change	GP 5.1: Deploy “best practices” across the organization	<i>Any changes to the procurement process or policies are applied to the entire organization.</i>	

Process Capability Assessment Instrument: Interview Guide

10

Process Area	3.11 Procurement
--------------	------------------

Questions
Base Practice: 3.11.1 Maintain vendor information
What was the process for creating a list of approved vendors? Have vendors been identified for each type of standard equipment? Does the list include more than one potential vendor for each type of standard equipment?
What information about potential vendors and those used in the past is stored? For example, is the history of transactions and quality of service received noted? Are special terms or conditions that apply to a vendor recorded?
Is information maintained on any regulatory requirements or existing contracts that could affect vendor selection?
When does vendor information get entered and who is responsible for maintaining it?
Who accesses the vendor information and for what purposes?
Base Practice: 3.11.2 Receive and log request
In what format does procurement receive a purchase request (e.g. a request form, on-line etc.)?
What information does the purchase request contain?
Does procurement verify that the request carries the necessary approval or authorization? How is this done? Whose approval is required for purchases? Does a documented policy describe the necessary authorizations?
For non-standard orders, does procurement verify the technical compatibility of the equipment/software requested? What is the process for verifying compatibility?
Is every request logged when received? If so how? Are these procedures documented?
Base Practice: 3.11.3 Identify vendor and place order
What is the process for selecting a vendor for a particular order? Is the vendor listing and information used?
Does negotiation of specific terms occur with the vendor after selection, or does any preliminary negotiation occur with several potential vendors and then are the outcomes considered during selection?
Who is responsible for placing an order? Is a purchase order or other document used? If so, please describe. Is the log updated when the order is placed?
Is the requester notified of the order placement and estimated delivery date?
Base Practice: 3.11.4 Track orders
How are open orders tracked? Do specified checkpoints exist when all open orders are reviewed to identify any over-due deliveries?
Is a backlog and backorder information maintained? If yes, by whom?
In what instances does procurement need to communicate with rollout/release management? What information is exchanged?
What action is taken if an order is overdue?
Base Practice: 3.11.5 Ensure timely/accurate delivery & log assets received
What is the procedure for handling receipt of equipment delivered? How is procurement involved?
Are any proactive steps taken to ensure timely delivery (e.g. supplier is contacted shortly before the delivery date to verify the delivery)
Does procurement verify that the correct equipment was received? How?
Is the receipt logged and the request record closed? What is the procedure for this?
Who is responsible for logging all assets received in the asset management system?
What information about the new asset is logged?
Base Practice: 3.11.6 Manage returns and replacements
Do any policies exist on how returns and replacements are to be handled? If so, please describe them. Who is responsible for this task?
Under what circumstances (i.e. inaccurate order placement, inaccurate order delivery etc.) do returns typically occur?
What type of documentation is made for any returns or replacements handled?
Base Practice: 3.11.7 Report on procurement activities & assess procurement strategy
Does procurement produce any reports on a regular basis? If so, what reports are produced and what do they present?
Who reviews the reports and for what purposes?
Do periodic reviews occur to evaluate and modify the procurement strategy, if needed? If so, who is involved in this assessment process and how frequently does it occur? What types of issues are considered (e.g. are current suppliers performing adequately) ?

Generic Questions for Process Area
Has a procurement strategy been explicitly defined? If so, please describe it. Do actual procurement practices support this strategy?
Are any data (e.g. percentage of requested items delivered on time, differential between actual and budgeted equipment costs etc.) collected to measure performance of the procurement process? If so, what are they?
Are any quantitative performance targets set for procurement? If so, please describe them. Is performance evaluated against these targets?
What type of training do procurement personnel receive? Are employees aware of all document policies and procedures?
Is the procurement process periodically reviewed/evaluated with the intent of identifying potential improvements? If so, how frequently does this occur and who is involved?
Do you find that adequate resources are allocated for procurement activities? Please elaborate.

Process Capability Assessment Instrument

Process Area	3.11 Procurement
Process Area Description	Procurement is responsible for ensuring that the necessary quantities of equipment (both hardware and software) are purchased and delivered on time to the appropriate locations. Procurement is also responsible for logging all assets into the inventory as they are received.

5 Questionnaire

Process Area	3.11 Procurement
--------------	------------------

		Yes	No	Don't Know	N/A
1	Do you maintain a list of all approved vendors?				
2	Do you record information (e.g. transaction history, special terms or conditions) on vendors used?				
3	Is each request received by procurement logged?				
4	Does analysis occur to determine the best vendor for each purchase?				
5	Are open orders tracked?				
6	Are mechanisms in place to ensure timely and accurate delivery?				
7	Are all assets received logged in the asset management system?				
8	Are returns and replacements coordinated?				
9	Does reporting on procurement activities occur?				
10	Is the procurement strategy periodically assessed?				

10

Work Product list

Process Area	3.11 Procurement
--------------	------------------

15

- Purchase request form
- Purchase order
- Sample vendor profile
- Procurement reports
- 20 Current Procurement catalogue of vendors/suppliers

Quality Management (4.3)

PA Number	4.3
PA Name	Quality Management
PA Purpose	Quality Management is an on-going process, which monitors how well the distributed environment is being managed, and looks toward continually improving its management capabilities and service. Within this process, quality improvement actions are determined,

	agreed upon, planned and monitored
PA's Base Practices	Determine quality management actions Discuss possible quality improvement actions with appropriate parties Develop implementation plans for quality improvement actions Monitor and assess the progress toward quality improvement Report on the progress toward quality improvement Review the assessments with the appropriate parties
PA Goals	To provide the best quality service To ensure the distributed environment is being managed and run to its fullest capacity
PA's Metrics	Percent of satisfied customers of the Service Provider Percent of time spent doing quality checks

Base Practices

BP Number	4.3.1
BP Name	Determine quality management actions
BP Description	A plan detailing actions for monitoring and improving the quality of operations is developed. Methods for assessing quality and quality improvements are included.
Example	<i>Actions to be performed might include: Administering customer surveys to identify perceptions of quality Performing periodic audits to ensure that policies and stipulated procedures are being followed Collecting performance metrics Setting targets for qualitative and quantitative assessment indicators and assessing whether targets are met</i>
BP Number	4.3.2
BP Name	Discuss possible quality improvement actions with appropriate parties
BP Description	Potential quality improvement measures are identified and reviewed with management, any designated quality improvement personnel, and representatives from the various departments/groups that would be monitored.
Example	<i>The quality management and improvement plan is submitted to all involved parties for review and feedback. A finalized version of the plan is created and approved by these parties.</i>
BP Number	4.3.3
BP Name	Develop implementation plans for quality improvement actions
BP Description	Schedules for the planned quality improvement actions are outlined. Necessary resources and/or staff are requisitioned. Roles and responsibilities are assigned.
Example	<i>Based on quality reports an action plan is developed with defined roles and scheduled benchmarks to improve upon current quality levels.</i>
BP Number	4.3.4
BP Name	Monitor and assess the progress toward quality improvement
BP Description	Collect data on predefined assessment indicators and assess against quality targets set. Also assess the change in these quality measures over time.
Example	<i>Quality improvement personnel track and trend quality measures.</i>
BP Number	4.3.5
BP Name	Report on the progress toward quality improvement
BP Description	Generate reports presenting the results of the quality assessment process and disseminate to appropriate parties.
Example	<i>Quarterly reports are produced depicting current status vis-a-vis targets and changes over time. The reports are made available to customers, and are distributed to management and parties assessed.</i>
BP Number	4.3.6
BP Name	Review the assessments with the appropriate parties
BP Description	Management and the parties assessed review quality reports. Any significant issues or problem areas are discussed and tasks for handling the concerns are identified.
Example	<i>In situations where actual performance is lagging behind targets, the causes (e.g. inadequate resources, disregard of policies etc.) of the gap are analyzed and solutions identified.</i>

References

	MODE v1 Toolkit
--	-----------------

Process Area: Quality Management

Level 1

Assessment Indicators: Process Performance

5 Generic Practice: Ensure that Base practices are performed

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
4.3.1 Determine quality management actions	<i>A plan outlining all quality management actions is available.</i>	
4.3.2 Discuss possible quality improvement actions with appropriate parties	<i>Minutes of the annual meeting held to discuss and decide on quality improvement tasks for the upcoming year are available.</i>	
4.3.3 Develop implementation plans for quality improvement actions	<i>Documented plans and schedules are available for quality improvement actions.</i>	
4.3.4 Monitor and assess the progress toward quality improvement	<i>Assessment data is collected for quality monitoring.</i>	
4.3.5 Report on the progress toward quality improvement	<i>Periodic reports on quality levels and improvements are produced and available.</i>	
4.3.6 Review the assessments with the appropriate parties	<i>Quality performance is reviewed annually and further improvements identified.</i>	

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>Documentation is maintained of all necessary quality management activities to be performed.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>Resources are available to complete all planned and scheduled performance improvement actions.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>Personnel involved with quality management receive appropriate training.</i>	
	GP2.4 Collect data to measure performance	<i>Data such as the following are collected: percentage of satisfied customers of the Service Provider, percent of time spent doing quality checks.</i>	
	GP2.5 Maintain communication among team members	<i>A designated quality management team exists and serves as a central point for reporting and coordinating all quality management activities.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>Quality level and improvement reports are produced according to predefined specifications for format and content.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>Quality improvement action plans are placed under version control to keep track of annual changes.</i>	

10 Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process	GP3.1: Define policies and	<i>If individual business units or</i>	

Definition	procedures at an IT level	<i>departments are responsible for their quality improvement tasks, a system for conveying information to a central point or a reporting structure is in place.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>Planning for future human resource needs is done based on the long-term quality improvement action plans.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>Quality management occurs according to stated policies and procedures. (e.g. all specified quality assessment data is collected, all predefined reports are created, etc.)</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>Customers are surveyed for quality perceptions and desired improvements.</i>	

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Targets are regularly set for metrics assessing quality. Actual measures are compared against these targets.</i>	
	GP4.2 Automate data collection	<i>Periodic customer surveys are sent electronically and the results are tabulated automatically.</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>All defined assessment data requirements are met.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>Appropriate steps are taken to address discrepancies between actual quality levels and targets set.</i>	

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>The quality management process is periodically evaluated with the intent of identifying potential modifications or additions that would enhance efficiency and/or success of quality improvement initiatives.</i>	
Process Change	GP 5.1: Deploy “best practices” across the organization	<i>Any changes to the quality management procedures are applied to all relevant departments or areas.</i>	

5

Process Capability Assessment Instrument: Interview Guide

Process Area	4.3 Quality Management
--------------	------------------------

Questions
Base Practice: 4.3.1 Determine quality management actions
By what process were/are quality management actions determined?
Please describe the various quality management tools used to verify and measure quality. (e.g. customer surveys, audits, collection/evaluation of performance metrics)?
Is a set of assessment indicators specified by which quality of operations is measured? If so, what are

these measures?
What parties are involved in the quality management process? Has a single group been designated to manage the process? If so, what are the roles and responsibilities of the group?
Base Practice: 4.3.2 Discuss possible quality improvement actions with appropriate parties
What is the process for identifying quality improvement actions? Is this process specified in the quality management documents?
What parties are involved in reviewing and selecting quality improvement actions (e.g. management, business units or departments, quality management personnel)?
Is a finalized plan created that details all the quality improvement tasks to be undertaken? Does this plan require approval by management or any other parties? If yes, by whom?
How frequently are quality improvement actions discussed?
Base Practice: 4.3.3 Develop implementation plans for quality improvement actions
Who is responsible for creating implementation plans for the quality improvements decided on? What information is included in the implementation plan?
Is a schedule for the various quality improvement actions outlined? If yes, what is included in the schedule
Are roles and responsibilities assigned for each of the quality improvement items? If yes, what are they?
Are a predetermined set of resources allocated to quality improvement/management, or can resources be requisitioned as needed? If the former, what resources are allocated to quality management and if the latter, how are the resources determined and acquired?
Base Practice: 4.3.4 Monitor and assess the progress toward quality improvement
How is the implementation of quality improvement actions monitored?
Are data on predefined assessment indicators collected to evaluate the quality improvement progress? If yes, please describe the type of data that are collected.
Are quality targets set? If yes, what are the targets? Is performance compared to these targets? How is performance measured?
Base Practice: 4.3.5 Report on the progress toward quality improvement
What reports are produced on quality levels and quality improvement? What are the contents of these reports? Who receives these reports?
Are the reports created based on predefined guidelines for format and content? If yes, please describe these guidelines on format and content.
How frequently are quality level reports produced?
Base Practice: 4.3.6 Review the assessments with the appropriate parties
Who receives and reviews the quality assessment reports?
What actions result from the review of these quality assessment reports?
If performance does not meet targets set, are the causes identified and solutions sought? If yes, what is the process for identifying these causes? Please provide some examples of solutions to performance quality problems.
Generic Questions for Process Area
Is the quality management process periodically reviewed to identify potential improvements? If so, how frequently does this occur and who controls this process?
Do you find that adequate resources are allocated for quality management? What are the resources? If inadequate, please elaborate.
What type of relevant qualifications and training do quality management personnel have? Do they receive any formal training or does most of the learning occur on the job?

Process Capability Assessment Instrument

Process Area	4.3 Quality Management
Process Area Description	Quality Management is an on-going process, which monitors how well the distributed environment is being managed, and looks toward continually improving its management capabilities and service. Within this process, quality improvement actions are determined, agreed upon, planned and monitored.

Process Area	4.3 Quality Management
--------------	------------------------

		Yes	No	Don't Know	N/A
1	Are steps taken to identify actions for improving the quality of operations of the distributed environment?				
2	Are possible improvement actions discussed with appropriate parties?				
3	Are implementation plans for quality improvement developed?				
4	Is the progress toward quality improvement monitored and assessed?				
5	Are reports generated on the progress of quality improvement?				
6	Do appropriate parties review the quality reports?				
7	Are issues or problem areas identified and solutions developed?				

Work Product list

5

Process Area	4.3 Quality Management
--------------	------------------------

- Quality improvement action plan
- Quality improvement action schedule
- Quality assessment reports
- Organizational chart or hiring matrix of quality assessment team

10

PA Number	4.5
PA Name	Legal Issues Management
PA Purpose	Legal Issues Management addresses the legal liability considerations associated with doing business on a public network. To ensure that a legal risk is limited, there is a need for a close tie between Service Provider's Operations departments and Legal department.
PA's Base Practices	Identify legal risk areas Identify content types where one may be legally at risk Identify legal/business requirements for groups Legal process setup and refinement
PA Goals	To identify legal liability considerations To serve as a communications tool/discussion document for the process in ongoing steps.
PA's Metrics	Number of complaints filed against the sponsoring entity Number of complaints escalated to the legal department Percentage of complaints resolved without court filing or the commencement of litigation by the legal department Percentage of complaints that end in settlement/trials/alternative dispute resolution

Base Practices

BP Number	4.5.1
BP Name	Identify legal risk areas
BP Description	The purpose of this activity is to identify and understand legal risk areas in the net centric environment.
Example	<i>Listed are some examples to take into consideration, but should not be limited to what is shown:</i> <i>Copyright infringement</i> <i>Misrepresentation</i> <i>Slander</i> <i>Defamation</i> <i>US & Global Jurisdictional Issues</i> <i>Export Issues</i> <i>Privacy Issues</i> <i>Security Issues</i> <i>Advertising</i>
BP Number	4.5.2
BP Name	Identify content types where one may be legally at risk

BP Description	The legal department should review content types to determine the legal risks associated with publishing the content.
Example	<i>Textual information Dynamic HTML Audio Video Graphics Active X controls Java Applets Database-driven content</i>
BP Number	4.5.3
BP Name	Identify legal/business requirements for groups
BP Description	Legal/Business requirements pertaining to any group within an organization need to be developed.
Example	<i>The following lists are the groups of customers one should keep in mind when creating requirements for legal issues management: System Users Internal to Company Public Corporations Governments Groups who create your systems Internal employees Contractors</i>
BP Number	4.5.4
BP Name	Legal process setup and refinement
BP Description	Create new and update existing deliverable/document that contains the requirements for the Legal Issues Management process.
Example	<i>This deliverable/document can be used to: Document Business Capability Requirements Gather requirements for ongoing legal issues Serve as a communications tool/discussion document for the process in ongoing steps. Define and Carry out formal contracts Maintain formal contracts</i>

References

	MODE v2 Web sites: www.epic.org and legal.web.aol.com
	MODE v1 Toolkit

Process Area: Legal Issues Management

Level 1

Assessment Indicators: Process Performance

5 Generic Practice: Ensure that Base practices are performed

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
4.5.1 Identify legal risk areas	<i>A list of legal risk areas are identified, for example: copyright infringement, slander, privacy and jurisdiction issues.</i>	
4.5.2 Identify types of content where one may be legally at risk	<i>A list of content types that are legal risk areas for the web site, for example: audio, video, graphics and Java applets.</i>	
4.5.3 Identify customers	<i>A list of customers and their perspective legal issues/complaints for the web site. These may include system, government, contractors, internal employees and public customers</i>	

4.5.4 Legal process setup and refinement	<i>A formal legal process has been defined and redefined due to new issues, policies and laws that have an affect on web publishing and sites.</i>	
--	--	--

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>A policy regarding web publishing and sites with regards to legal issues management is established.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>All legal issues management personnel have the appropriate web site access for all material review. They should have the appropriate access to litigation journals, symposiums, and WWW sites that cover local, state, national and international litigation and laws concerning the web and web publishing.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>New legal issues management personnel are trained on the process, procedures and technologies of the group.</i>	
	GP2.4 Collect data to measure performance	<i>Data are collected to provide information on: number of complaints filed with legal department, % of complaints resolved by legal department, etc.</i>	
	GP2.5 Maintain communication among team members	<i>Web site legal issues/complaints are tracked and logged. The legal issues group provides status reports.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>A completed tracking document or report showing the progression of a web page throughout the entire legal issues management process.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>Version control for legal issues management purposes has been established on all web pages and change control documents are produced referencing any overlapping departments (e.g. marketing, engineering, etc.).</i>	

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an organization level	<i>Legal issues management handles all web site legal complaints/issues according to stated policy vs. ad hoc.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>Legal issues management provides and subsequently obtains the survey results from web pages as a feedback avenue. E-mail to the firm via the web site can also be a feedback avenue.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>There is one centralized net centric legal issues management group for the organization vs. each division or group going to different legal avenues</i>	
	GP3.4 Provide feedback in order to maintain knowledge	<i>New employees within legal issues management receive training and all</i>	

	and experience	<i>employees receive subsequent training for new skills, issues, and technologies. Future employee requirements are addressed.</i>	
--	----------------	--	--

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Addressing and responding to legal issues based on strategic business needs vs. industry standards.</i>	
	GP4.2 Automate data collection	<i>Metrics are automatically collected from the web site for legal issues management purposes vs. a manual collection, for example: hits per page, peak usage, survey results, e-mail per month regarding a subject matter, etc</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>Metrics automatically collected by legal issues personnel are analyzed and reported.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>Legal issues management is evaluated against performance goals and metrics for suggested improvements and revisions to the process.</i>	

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>Legal issues management is continuously improved via incremental changes, an example: change a 10 pt black font disclaimer message, noting that colors of products shown on web pages may not match exact shading of shipped product, to a 16 pt red font.</i>	
Process Change	GP 5.2: Deploy “best practices” across the organization	<i>Process improvement noted in 5.1 example is validated via metrics and business goals, for example: legal complaints for product misrepresentation are down 11% and returned product, with wrong color noted as reason, down 17%.</i>	

5

Process Capability Assessment Instrument: Interview Guide

Process Area	4.5 Legal Issues Management
--------------	-----------------------------

Questions
Base Practice: 4.5.1 Identify legal risk areas
1. Is the web site reviewed for legal risk issues prior to publishing? If yes, by whom and how often? If no, why?
What issues have provided the most concern? Have these concerns been made known to and been addressed by the web master, content management or other related operational areas? If yes, how are they made know (e.g. symposiums, reports, conferences, phone mail, etc.) and addressed (e.g. policy, procedures, reviews, etc.)?
Are legal issues personnel consistently made aware of new issues, litigation and laws that might affect future web publishing? If yes, what is of concern?

Does the web site contain any disclaimers that would remove you from liability issues? If yes, what are they and what prompted their use?
Are legal issues reviewed on a state, domestic or worldwide scope? How has this view helped or hindered the process? Is jurisdiction a justification for the chosen scope?
Base Practice 4.5.2 Identify types of content where one may be legally at risk
Does the legal issues personnel review the different types of content (e.g. graphics, video, audio, Java applets, etc.) for risk? If yes, what types provide the most and least concern? Who is responsible for this review? How often is it done?
Is there a process in place to gain permission to use/publish copyrighted material? If yes, what is it? Is it consistently followed? Who is responsible for this? What types of content are the most protected/least protected?
Does the site allow any customers to download/FTP software? If yes, what software and what legal notifications are provided to the customers?
Are the graphics/text for any sales products provided with a disclaimer (e.g. color may be different than actual, size may be different, quantities are limited, etc.)? If yes, what are they?
Base Practice: 4.5.3 Identify customers
Are pages evaluated with customers, laws, business goals, and employees in mind? If yes what are the areas of concentration/review for these each of these audiences?
Do customers communicate with the firm regarding legal concerns or complaints? If yes, how do they do this? To whom is this communication directed? Which group of customers seem to be the most vocal about the content (e.g. system, public, corporations, government, etc.)?
Do all customers, who are not employed with the firm, have the ability to gain access to all parts of the web site (e.g. chat rooms, join e-mail lists, place orders, view inventory, etc.)? If yes, what are the most popular destinations and peak times? Are surveys offered to these customers? If no, what type of access control do you provide (log-on and password, return e-mail address, etc.) and are legal disclaimers provided for any legally sensitive areas? Please explain.
When responding to complaints or legal instruments initiated by a customer, do the legal issues management personnel meet with other counsel to respond or is the issue handed off to another department? In your experience, has this happened before and what were the circumstances?
Base Practice: 4.5.4 Legal process setup and refinement
Is the legal issues management procedure/policy maintained to address new net centric issues? If yes, by whom and how often? Is it consistently followed?
Does the legal issues management personnel forward documents in question to corporate counsel for review, approval/change and/or resolution? If yes, explain the procedure. Who is responsible for tracking the document once it is transferred to corporate counsel? Explain this tracking.
What legal requirements and issues(e.g. privacy, censorship, freedom of information, intellectual property, etc.) are gathered on an on-going basis to ensure legal credibility for the site?
Are new business offerings by the firm viewed for operational legal requirements? If yes, by whom and how often (e.g. scheduled vs. ad hoc)?
Does the legal issues group maintain contracts and ensure their deployment for compliance? If yes, who is responsible for this and how often are reviews performed?
Generic Questions for Process Area
What is the standard procedure/policy with regard to legal issues management tasks and procedures? Is it followed? At any time are some procedures done in an ad hoc manner? If yes, please explain?
Are adequate tools and personnel available for legal issues management tasks and procedures? What are the tools and who are the personnel?
Is training held for new employees within the legal issues management group? If yes, is this done on the job or during formal training sessions? Are classes / training provided to all legal issues personnel which cover new issues/procedures/tasks etc.? If yes, how often is this planned?
Have measures been defined, selected and subsequent data collected for legal issues management? If yes, what type and how often?
What reports are provided to various departments within the firm from legal issues management regarding pertinent issues (e.g. changes to plans, decisions, process, requirements, etc.)? To whom do they go and how often? Do recipients of these reports provide feedback to legal issues management? If yes, what method is used

(e.g. e-mail, meetings, hardcopy, etc.)?
Does the legal issues management group provide web pages with version control numbers and change order requests for updated page content?
Are all change order requests for web pages signed off by legal issues management? If no, why? If yes, by whom? How often is this done?
Are metrics automatically collected from the web site for use by legal issues personnel? If yes, what is it? How is it collected (e.g. automated, manually, both)?
Are the legal issues management processes continually improved? If yes, how? Are the improvements validated and quantified against business goals and objectives?
Is your legal issues team made up of qualified lawyers? What type of continuous education do the pursue?

Process Capability Assessment Instrument

Process Area	4.5 Legal Issues Management
Process Area Description	Legal Issues Management addresses the legal liability considerations associated with doing business on a public network. To ensure that a legal risk is limited, there is a need for a close tie between Service Provider's Operations departments Legal department.

5 Questionnaire

Process Area	4.5 Legal Issues Management
--------------	-----------------------------

		Yes	No	Don't Know	N/A
1	Are legal risk areas identified?				
2	Are types of content that might carry legal risk identified?				
3	Are legal issues and risks reviewed with customers in mind?				
4	Once legal questions/complaints have been posed concerning a web page or site, are steps taken to re-review the questionable material?				
5	Is there a formalized process for legal issues management?				
6	Is the formalized process updated with relevant/current data and issues?				

10 Work Product list

Process Area	4.5 Legal Issues Management
--------------	-----------------------------

Legal Issues Management procedure manual /policy

Examples of bulletins/notifications regarding new legislation that would affect content.

15 Sample reports from legal issues group noting complaints, issues or concerns for existing and future web development.

Example of a legal issues tracking document for web pages/sites showing the progression of the page/s through review/approval cycle.

20 Capacity Modeling & Planning (4.6)

PA Number	4.6
PA Name	Capacity Modeling & Planning
PA Purpose	Capacity Planning attempts to ensure that the adequate resources will be in place to meet SLA requirements. Resources include physical facilities, computers, memory, disk space, communications equipment, and personnel. Capacity Planning must be done for the system as a whole so that the planners can understand how the capacity of one portion of the system affects the capacity of another. Due to the large number of components typically found within a system, the interdependencies between business functions and resource components must be clearly defined.
PA's Base Practices	Define overall CM & P requirements Collect all capacity information (based on business requirements) Determine ongoing support requirements Build and test capacity model

	Deploy model, and adjust as appropriate
PA Goals	To gather sufficient capacity data and support requirements so accurate decisions are made to ensure resource availability. To ensure that adequate resources are in place to support existing SLAs and OLAs.
PA's Metrics	% of CPU Utilization % of Memory Utilization % of segment Utilization % of Disk Capacity Number of customers per application % of I/O activity % of segment errors % of time a transaction is performed for each business driver

Base Practices

BP Number	4.6.1
BP Name	Define overall Capacity Modeling & Planning requirements
BP Description	Business drivers are defined, accurate workload forecasts are prepared, and alternative capacity solutions are evaluated.
Example	<i>Having a documented plan of what business drivers affect the Capacity Model and the forecast of business growth will help in defining the businesses options if alternative capacity solutions are needed. By tracking the Capacity Plan trend from year to year you will be able to conduct future forecasting of growth and support needs.</i>
BP Number	4.6.2
BP Name	Collect all capacity information (based on business requirements)
BP Description	A software review is performed to ensure that existing tools are available to collect all data needed to produce the Capacity Plan and model system capacity.
Example	<i>Performance Management Data is obtained to ensure that hardware and software is used optimally. Capacity Management Information is obtained to ensure that technical, business and cost data relevant to capacity and configuration management is held in a database and to produce technical and management reports which show current usage and trends. Requirements for the technical infrastructure are determined.</i>
BP Number	4.6.3
BP Name	Determine ongoing support requirements
BP Description	Factors for ongoing support for the operations environment, personnel, and functional areas are identified.
Example	<i>If company growth is projected at 40%, the growth of the Service Desk and Facilities support should be in proportion to accommodate this expansion.</i>
BP Number	4.6.4
BP Name	Build and test model
BP Description	The modeling approaches and tools to be used are modified. Effects of the proposed workloads on the system resources are modeled. As part of the modeling process, it should be confirmed that SLAs and OLAs can be met appropriately.
Example	<i>Hardware and LAN/WAN are just some examples of systems resources that should be monitored on how they will be affected by the proposed workloads. The workloads should also meet the service levels agreed upon in the SLAs and OLAs.</i>
BP Number	4.6.5
BP Name	Deploy model, and adjust as appropriate
BP Description	The capacity plan must be agreed upon, with its associated implications, by management. The capacity plan must be monitored periodically, and updated as necessary. If major changes to the system or the business occur, an entirely new capacity plan may need to be developed.
Example	<i>If a company is projected to grow by 10% and it actually exceeds this, the Capacity Plan must be revisited to make appropriate adjustments for network/server space, software licensing issues/accommodations, hardware issues, etc.</i>

References

	MODE v2
--	---------

	MODE v1 Toolkit

Process Area: Capacity Modeling & Planning
Level 1

Assessment Indicators: Process Performance

5 Generic Practice: Ensure that Base practices are performed

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
4.6.1 Define overall capacity modeling & planning requirements	<i>Base level model of system's capacity has been created and verified using vendor information, independent test, etc.</i>	
4.6.2 Collect all capacity information (based on business requirements)	<i>Capacity requirements report for distributed system/network is complete. This report would include financial, physical, operational, software and vendor requirements.</i>	
4.6.3 Determine ongoing support requirements	<i>Projections are available noting operational, functional and personnel requirements.</i>	
4.6.4 Build and test model	<i>Model is calibrated using model parameters, account discrepancies, etc. Shortfalls, assumptions/forecasts have been identified for testing purposes. Model is calibrated.</i>	
4.6.5 Deploy model, and adjust as appropriate	<i>Change request is processed for the capacity plan due to changes to the system or business.</i>	

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>Standard procedure exists for capacity planning and modeling, whether it is a new network or expansion/changes to the current network.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>Capacity planning personnel have access to financial, physical, operational, software and vendor requirements/data in order to complete a plan/model.</i>	
	GP2.3 Ensure personnel receive the appropriate type and amount of training	<i>Training policy is in place for new capacity planning and modeling staff.</i>	
	GP2.4 Collect data to measure performance	<i>Metrics are collected, for example: % of CPU, memory and segment utilization, number of customers per application, % of disk capacity.</i>	
	GP2.5 Maintain communication among team members	<i>Status reports that compare actual to planned utilization are distributed to customers, management and development personnel. Issues are tracked and reported.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>All applicable SLAs/OLAs, facilities, computers, memory, disk space and communications equipment are considered when producing a capacity plan.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>The capacity plan/model is placed under version control so the most current copy is reviewed on a scheduled and documented basis.</i>	

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an organization level	<i>Capacity planning and modeling are always handled according to the stated policy vs. ad hoc.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>SLA/OLA administrators email, Octel, or meet to provide feedback to capacity modeling and planning staff regarding contractual stipulations.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>There is one copy of the capacity model/plan for the system as a whole so that planners can understand how the capacity of one portion of the system affects the capacity of another.</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>New employees within the capacity model/plan group received training on the process. Subsequent process changes for distribution are noted to all capacity staff within training, meetings, videoconferencing, etc.</i>	

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Capacity modeling and planning is based on strategic business needs vs. industry standards.</i>	
	GP4.2 Automate data collection	<i>Metrics are automatically collected from the various systems administration software tools vs. manually collected.</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>The capacity modeling and planning is tied to forecasts and results tracking databases or reports. Adequate resources are in place to analyze and report on capacity modeling and planning data.</i>	
Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process	<i>Capacity modeling and planning is revised after reviewing actual data on a deployed model.</i>	

5

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>Capacity planning and modeling is continuously improved via incremental changes, an example: future threats to service levels can be identified for all systems vs. just one or two on an semi-annual basis.</i>	
Process Change	GP 5.2: Deploy “best practices” across the organization	<i>Process improvement in 5.1 example is validated via metrics and business goals, for example: since a threat was identified for one of the six systems, overall % of disk capacity could increase because of subsequent fix that was performed.</i>	

Process Capability Assessment Instrument: Interview Guide

5

Process Area	4.6 Capacity Modeling & Planning
Questions	
Base Practice: 4.6.1 Define Overall Capacity Modeling & Planning Requirements	
Has a base level model of the system’s capacity been created and verified based on information from vendors, independent tests, etc.? Are service measures used as comparisons? If yes, what are they? If no, explain.	
Explain your standard capacity planning process/policy, including CPU, memory, I/O and router usage and needs. All existing or future mainframe and server processors, storage, network configurations, and peripheral requirements should be addressed.	
Are the capacity requirements coordinated across distributed system based on SLAs/OLAs? If yes, explain. Are there outstanding SLA/OLA issues to be resolved? If yes, explain.	
Are alarms activated when a SLA/OLA is not met? If yes, how and to whose attention? If no, explain.	
Are workload balancing forecasts/plans in place? If yes, do they consider key transactions that have been collected and verified? Explain.	
What are the existing and future applications/data requirements that drive the capacity plan?	
What are the functional requirements/data that drive the capacity plan?	
Is there a policy in place to ensure the capacity plan updated regularly (semi-annual/annual/bi-annual) or only when changes/deviations are encountered? Please describe the policy.	
Are possible future threats/changes to service levels noted in the capacity plan?	
What is the plan of action for identified threats?	
Base Practice: 4.6.2 Collect All Capacity Information (Based on Business Requirements)	
What are the business drivers that affect the capacity model?	
What are the verified capacity plan requirements for the networks/distributed system? (e.g. financial, physical, operational, software, vendor, applications, constraints/limits.)	
Is the current system/version reviewed on a scheduled, documented basis to see how well it is being utilized? How often?	
Is performance/cost benefit analysis performed and tracked for each configuration? If yes, who does this and how often?	
What tools have been used to measure the system’s capacity?	
What reports are produced regarding capacity planning? Who receives these reports?	
Are the accuracy of assumptions, forecasts and results tracked?	
Base Practice: 4.6.3 Determine Ongoing Support Requirements	
What projections have been created and reviewed that address ongoing support requirements for operations, personnel and functions?	
2. Has the impact of planned business growth been evaluated with regards to support? If so, how?	
3. Has the impact of planned future locations been evaluated with regards to support? If so, how?	
Base Practice: 4.6.4 Build and Test Model	
1. How is the base model calibrated prior to adding forecast parameters? (e.g. verify model parameters, account for discrepancies, verify accuracy of base model, etc.)	
2. What forecast parameters/assumptions were added to the base model?	
3. How are capacity shortfalls identified?	
4. What model solutions address capacity shortfalls?	
5. Have assumptions and strategies been documented?	
Base Practice: 4.6.5 Deploy Model, and Adjust as Appropriate	
1. How often are reports disseminated to appropriate parties (e.g. weekly, monthly, etc.)?	
Is feedback received on utilization, capacity and performance?	
Do management, development, and customers receive status reports that compare actual to planned utilization for review/discussion?	
Does management review, revise and approve capacity plans? If no, explain.	
What is the course of action/process regarding the capacity plan if major changes to the system or business occur? Are other groups/process informed (e.g. release management, SLA, procurement, security, etc.)? Explain.	

Generic Questions for Process Area
1. Are training sessions held for personnel on a scheduled basis regarding the capacity planning process and its defined tasks? If so what type of training is provided to personnel to ensure adequate/competent execution of capacity plan?
2. Is there written documentation that covers the established capacity plan procedures for personnel?
3. How often is the capacity process reviewed for continuous improvement purposes? How often are improvements implemented and by whom?
4. When continuous improvement strategies are executed, how is the improvement validated against business and performance goals (e.g. benchmarks, basic measurements, etc.)?

Process Capability Assessment Instrument:

Process Area	4.6 Capacity Modeling & Planning
Process Area Description	Capacity Planning attempts to ensure that the adequate resources will be in place to meet SLA requirements. Resources include physical facilities, computers, memory, disk space, communications equipment, and personnel. Capacity Planning must be done for the system as a whole so that the planners can understand how the capacity of one portion of the system affects the capacity of another. Due to the large number of components typically found within a system, the interdependencies between business functions and resource components must be clearly defined.

5

Questionnaire

Process Area	4.6 Capacity Modeling and Planning
--------------	------------------------------------

		Yes	No	Don't Know	N/A
1	Has the scope of the capacity plan been determined?				
2	Have the capacity requirements for the networks/distributed systems been determined?				
3	Has a base level model of the system's capacity been created and verified based on information from vendors, independent tests, etc.?				
4	Are work load balancing plans in place?				
5	Have the capacity plans been reviewed with management?				
6	Has a report on the capacity plans been produced?				
7	Is feedback received on utilization, capacity and performance?				
8	Is the accuracy of assumptions, forecasts and results tracked?				

10

Work Product list

Process Area	4.6 Capacity Modeling and Planning
--------------	------------------------------------

Example of an Existing Capacity Plan/Reports

15

List of SLAs/OLAs requirements

List of resources referenced in Capacity Plan(e.g. physical facilities, computers, memory, disk space, communication equipment and personnel)

PA Number	4.7
PA Name	Business/Disaster Recovery Planning & Management
PA Purpose	Business/Disaster Recovery Planning & Management determines what the requirements are for disaster recovery based upon agreed upon SLAs, strategies and plans to restore a business or service after it has been interrupted or failed. This planning process develops the strategy for recovering a system or a portion of the system. The contingency plans must consider failure of both centralized and remote components and strategies for the recovery of these systems.
PA's Base Practices	Determine what disaster recovery requirements are based on SLAs Perform business and system risk assessment

	Determine recovery implementation plan Review recovery plan with management Plan disaster recovery testing procedures Produce and disseminate report on disaster recovery Receive feedback on disaster recovery strategy
PA Goals	Consider recovery planning and management in terms of effective cost-benefit analysis. Plans, strategy and management should be in place to re-route system resources to secondary, stable configuration until the primary resources can be restored at the centralized and/or remote site. Declaration of disaster procedures should be clearly documented both on-site and off-site. Key primary and backup recovery personnel should be identified and prepared in the event of a business or natural disaster.
PA's Metrics	Number of power supply failures per month. Number of HVAC failures per month. Number of disasters per month that prevent personnel from accessing site. Daily number of servers, their size, data, and estimated restore time Number of times planned restoration time exceeded actual per month.

Base Practices

BP Number	4.7.1
BP Name	Determine what disaster recovery requirements are based on SLAs
BP Description	Service Level Agreements may require compliance with system recovery timetables for various operations, servers, departments, etc.
Example	<i>The service desk may require a 4 hour recovery from network loss within an organization whereas mail systems loss may require a 8 hour recovery.</i>
BP Number	4.7.2
BP Name	Perform business and system risk assessment
BP Description	This process identifies business and system risks for insurance assessment. It also addresses the cost-benefit of each recovery plan to insure effective gain compared with monetary commitment.
Example	<i>Insurance needs to address accident, malicious intent and component failure when seeking and obtaining coverage. Analysis needs to be done on cost-benefit. A hot site, hot standby maybe too expensive for the service provided but a hot site, cold standby proves more efficient service for the dollar.</i>
BP Number	4.7.3
BP Name	Determine recovery implementation plan
BP Description	Plan needs to include all recovery procedures for each site. Personnel, tasks, equipment and timetables need to be included. Different scenarios also need to be accounted for and appropriate procedures should be incorporated for these.
Example	<i>The recovery plan from a site loss will be different than a major data loss. Personnel, time, hardware and backup requirements will be different and reflected within the plan.</i>
BP Number	4.7.4
BP Name	Review recovery plan with management
BP Description	This base practice allows for management to review resource capabilities, issues, and progress for each site. SLAs and cost-benefit analysis will also be examined.
Example	<i>Management's review of the recovery plans will show the readiness of the Service Provider Operations and the clear procedures needed to minimize any loss. Management review will also allows for cohesiveness so that the process area goals are obtained.</i>
BP Number	4.7.5
BP Name	Plan disaster recovery testing procedures
BP Description	Testing the disaster recovery procedures allows for successes, failures and compliance issues to be noted for future correction.
Example	Dry runs through procedures will not fully duplicate any disaster but should provide valuable insight into problems or issues during execution. As an example of such insight, personnel notification may prove more successful using alpha-numeric pagers versus alpha pagers only.
BP Number	4.7.6
BP Name	Produce and disseminate reports on disaster recovery
BP Description	Reports to management and disaster personnel should report on the success, failures or concerns of any disaster plan for any site. This allows for clear communication of the issues

	<i>at hand and ease of future fixes.</i>
Example	A report can be disseminated to disaster personnel noting any changes to procedures. This report will also document any current issues and potential fixes being addressed.
BP Number	4.7.7
BP Name	Receive feedback on disaster recovery strategy
BP Description	<i>Feedback allows for users, disaster recovery personnel and management to contribute valuable ideas, resolutions and issues to the process area.</i>
Example	Feedback could be collected via an electronic survey to users. Users may receive a survey once every six months and its contents incorporated into future disaster plans.

References

	MODE v2
	MODE v1 Toolkit

Process Area: Business/Disaster Recovery Planning & Management

Level 1

Assessment Indicators: Process Performance

5 Generic Practice: Ensure that Base practices are performed

Base Practice	Example of Assessment Indicator	Assessment Indicators at Client
4.7.1 Determine what disaster recovery requirements are based on SLAs	<i>Business/Disaster personnel, when asked, can list various SLA requirements, timetables and functions needed for compliance.</i>	
4.7.2 Perform business and system risk assessment	<i>Cost analysis is performed on the benefit of each plan. Risks are addressed and incorporated into each plan. Revenue loss estimates are know by business/disaster personnel, whether interruptions or total losses.</i>	
4.7.3 Determine recovery implementation plan	<i>A final plan is chosen for the respective sites. Plan is maintained for procedure improvements and/or changes to equipment/site. Personnel can access plan readily.</i>	
4.7.4 Review recovery plan with management	<i>Plan is reviewed by management.</i>	
4.7.5 Plan disaster recovery testing procedures	<i>Testing is performed on business/disaster recovery procedures on a scheduled basis. Results of testing are tracked.</i>	
4.7.6 Produce and disseminate report on disaster recovery	<i>Reports are forwarded to other process areas (e.g. Fault Management, Back-up/Restore/Archive, Physical Management, etc.). Reports may be hardcopy or electronic.</i>	
4.7.7 Receive feedback on disaster recovery strategy	<i>Feedback is solicited via surveys, reports, meetings etc. and used to improve the business/disaster process and associated procedures.</i>	

Level 2

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks	<i>Standard procedure exists for business/disaster recovery, whether it is for a system interruption, loss, natural disaster or malicious in nature.</i>	
	GP2.2 Allocate sufficient resources to meet expectations	<i>Business/disaster personnel have access to procedures, software, hardware and emergency contact information at all sites.</i>	
	GP2.3 Ensure personnel receive the appropriate type	<i>Training policy is in place for new business/disaster recovery personnel and</i>	

	and amount of training	<i>all personnel have attended this training.</i>	
	GP2.4 Collect data to measure performance	<i>Data are collected, for example: number of system interruption per month.</i>	
	GP2.5 Maintain communication among team members	<i>Status reports that compare actual to planned business/disaster objectives are distributed to users, management and other process area personnel. Issues are tracked and reported.</i>	
Work Product Management	GP2.6 Ensure work products satisfy documented requirements	<i>All applicable SLAs, sites, systems, applications, and type of disaster are considered when producing a business/disaster recovery plan.</i>	
	GP2.7 Employ version control to manage changes to work products	<i>The business/disaster recovery plan is placed under version control at each site so the most current copy is reviewed on a scheduled and documented basis.</i>	

Level 3 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Definition	GP3.1: Define policies and procedures at an organization level	<i>Business/disaster recovery plans are always handled according to the stated policy vs. ad hoc.</i>	
	GP3.2 Define tasks that satisfy the process purpose and business goals consistently and repeatedly	<i>Fault Management, Monitoring, etc. can email, leave voicemail, or meet to provide feedback to Business/disaster recovery staff regarding issues.</i>	
Process Resource	GP3.3: Plan for human resources proactively	<i>All business/disaster recovery plans are brought together into one plan for management review. This provides an easier understanding of how one interruption or failure of a server may affect another.</i>	
	GP3.4 Provide feedback in order to maintain knowledge and experience	<i>New employees within the business/disaster recovery group received training on the process. Subsequent process changes for recovery planning and management are noted to staff within training, meetings, videoconferencing, etc. Future employee needs are addressed.</i>	

Level 4 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment	<i>Targets are set for business disaster recovery and planning based on strategic business needs vs. industry standards.</i>	
	GP4.2 Automate data collection	<i>Metrics are automatically collected, for example: % of cases where actual recovery is longer than estimated.</i>	
	GP4.3 Provide adequate resources and infrastructure for data collection	<i>Business/disaster recovery planning and management's software is tied to Back-up/Restore/Archive systems for metrics reporting and issues tracking. Adequate resources are in place to analyze and report on business/disaster recovery planning and management.</i>	
Process Control	GP4.4 Use data analysis	<i>Business/disaster recovery planning and</i>	

	methods and tools to manage and improve the process	<i>management .is revised after reviewing actual data on a tested procedures, metrics and management review against business goals established.</i>	
--	--	---	--

Level 5 Assessment Indicators

Process Attribute	Generic Practice	Example of Assessment Indicator	Assessment Indicators at Client
Continuous Improvement	GP5.1: Continually improve tasks and processes	<i>Business/disaster recovery planning and management. is continuously improved via incremental changes, an example: Change from alpha pagers to alpha-numeric pagers when notifying personnel of server loss.</i>	
Process Change	GP 5.2:Deploy “best practices” across the organization	<i>Process improvement in 5.1 example is validated via metrics and business goals, for example: Information on pager proves more valuable in alpha form since personnel responded 72% of the time on the first message versus 58% with old pagers. This lead to a increase of 7% of SLAs deliverables that met compliance timetable.</i>	

Process Capability Assessment Instrument: Interview Guide

5

Process Area	4.7 Business/Disaster Recovery Planning & Management
--------------	--

Questions
Base Practice: 4.7.1 Determine what disaster recovery requirements are based on SLAs
Are business/disaster recovery plans based on SLAs or documented business requirements? If yes, how are these communicated to the group and how often?
What SLA requirements are difficult to address or have not been addressed thus far? Are these issues being examined for possible solutions? If yes, by whom?
Do SLA requirements note speed of recovery and capacity? Are they prioritized? If no, explain.
Base Practice: 4.7.2 Perform business and system risk assessment
Are business and system risk assessments done? If yes, by whom and how often? Is potential revenue loss considered during system failure or loss?
Is cost-benefit analysis performed when additions or changes are made to the recovery plan? Is this based on servers, applications, SLAs? Explain.
Are business goals developed during the risk assessment? If yes, what are they?
Has it been determined what critical data should be moved off site when performing the risk assessment? If yes, how is this determined?
Are business risk assessments performed considering security management, political instability and malicious intent? If yes, by whom and how?
Base Practice: 4.7.3 Determine recovery implementation plan
Is there a formal policy regarding the recovery plan at all sites? If yes, is it followed? Is it accessible to all recovery personnel? If no, explain. If yes, is it in multiple locations? Which sites? Is revision control maintained?
Are teams established within the plan for notification and at a predetermined location in case of a disaster declaration? If yes, explain.
Are metrics collected regarding the recovery plan? If yes, how often and what are they? Are they collected automatically or manually?
Are lists maintained showing hardware and supplies needed during a disaster? If yes, where is this list? Are copies maintained for each site and at a remote location for safeguard? Who is aware of these lists?
Does the plan examine the recovery of dependent or independent applications? If yes, which ones?

Has a cost analysis been performed on the loss of each application?
Are any recovery procedures performed by hot/cold sites? If yes, do they have back-ups, procedures and schedules? If yes, how are these maintained/updated?
How often is the plan reviewed? Do other process area personnel (e.g. Back-up/Restore/Archive, Fault Management, Monitoring) review the plan? If yes, explain the process and describe who participates in the review.
Base Practice: 4.7.4 Review recovery plan with management
Does the management team review business/disaster recovery plans? If yes, how often? Is the management team static or dynamic?
Does the plan call for the management team to resolve resource conflicts? If yes, is a procedure noted for each site?
Base Practice: 4.7.5 Plan disaster recovery testing procedures
Are tests performed on the business/disaster recovery procedures/tasks at each site? If yes, how often?
Explain what procedures pose the most concern (e.g. business or disaster) during the testing phase? Have modifications been implemented to improve process? If yes, what has been the outcome?
Are other departments brought into the testing environment for an end-to-end run through (e.g. Fault Management, Back-up/Restore/Archive, Monitoring, Physical Site Management, etc.)? If yes, which ones and how? Are other process areas tied with business/disaster recovery systems for automatic notification or metrics collection? If yes, explain.
Base Practice: 4.7.6 Produce and disseminate report on disaster recovery
Are reports produced and disseminated regarding the business/disaster recovery plan? If yes, to whom and how often? If no, explain.
What are the contents of the reports that are disseminated?
Do reports include the latest testing results? Metrics? If yes, which ones?
Base Practice: 4.7.7 Receive feedback on disaster recovery strategy
Is feedback sought and collected regarding the business/disaster recovery plan? If yes, by whom and how?
Is the feedback used for continuous improvement reasons? If yes, has this proven to be beneficial? If no, how could the feedback process be changed to provide benefit?
Generic Questions for Process Area
Is training provided to new business/disaster recovery personnel? If yes, in what format (e.g. on the job, formal training, computer based training, etc.)?
Are adequate resources (e.g. personnel, equipment, software, etc.) provided to perform the necessary recovery procedures?

Process Capability Assessment Instrument

Process Area	4.7 Business/Disaster Recovery Planning & Management
Process Area Description	Determines what the requirements are for disaster recovery based upon agreed upon SLAs, strategies and plans to restore a business or service after it has been interrupted or failed. This planning process develops the strategy for recovering a system or a portion of the system. The contingency plans must consider failure of both centralized and remote components and strategies for the recovery of these systems.

5

Questionnaire

Process Area	4.7 Business/Disaster Recovery Planning & Management
--------------	--

		Yes	No	Don't Know	N/A
1	Do the business/disaster recovery plans incorporate SLA requirements?				
2	Are business and systems risks analyzed for business/disaster recovery plans?				
3	Is there a formalized business/disaster recovery plan for each site?				
4	Is the formalized business/disaster recovery plan reviewed by management?				
5	Are tests performed on the business/disaster recovery procedures for effectiveness?				

6	Are reports disseminated regarding the status/readiness of the business/disaster recovery plan?				
7	Is feedback solicited and collected on the business/disaster recovery plan?				

Work Product list

Process Area	4.7 Business/Disaster Recovery Planning & Management
--------------	--

- 5 1. Example of an existing business/disaster recovery procedure for each of the sites (on site copy and off site copy should be the same).
- 2. Example of a business/disaster recovery plan report.
- 3. List of SLAs prioritized business/disaster recovery management
- 4. Schedule of Back-up/Restore/Archive tasks for each site.

10

While various embodiments have been described above, it should be understood that they have been presented by way of example only, and not limitation. Thus, the breadth and scope of a preferred embodiment should not be limited by any of the above described exemplary embodiments, but should be defined only in accordance with the following claims and their equivalents.

15

CLAIMS

What is claimed is:

- 5 1. A method for determining capability levels of a process area in an operational maturity investigation comprising the steps of:
- (a) defining a plurality of process attributes;
 - (b) defining a plurality of generic practices for each of the process attributes;
 - (c) defining a plurality of capability levels in terms of groups of the process attributes;
 - 10 (d) rating each of the process attributes based on achievement of the corresponding generic practices;
 - (e) determining which of the capability levels is achieved by a process area based on the rating of the process attributes of the capability levels; and
 - (f) outputting the capability level.
- 15 2. The method as set forth in claim 1, wherein the capability levels are each achieved upon the ratings of the process attributes of the capability level surpassing a predetermined amount.
3. The method as set forth in claim 1, wherein each capability level is defined by the process attributes of a lower capability level and is further defined by at least one more
20 process attribute.
4. The method as set forth in claim 1, wherein the process attributes include process attributes selected from the group of process attributes consisting of process performance, performance management, work product management, process definition, process resource, process measurement, process control, continuous improvement, and process
25 change.
5. The method as set forth in claim 1, wherein the capability levels include capability levels selected from the group of capability levels consisting of performed informally, planned and tracked, well defined, quantitatively controlled, and continuously improving.

6. The method as set forth in claim 1, and further comprising the step of gauging a maturity of an operations organization based on the outputted capability level.
7. A computer program embodied on a computer readable medium for determining capability levels of a process area in an operational maturity investigation comprising:
- 5 (a) a code segment that defines a plurality of process attributes;
- (b) a code segment that defines a plurality of generic practices for each of the process attributes;
- (c) a code segment that defines a plurality of capability levels in terms of groups of the process attributes;
- 10 (d) a code segment that rates each of the process attributes based on achievement of the corresponding generic practices;
- (e) a code segment that determines which of the capability levels is achieved by a process area based on the rating of the process attributes of the capability levels; and
- (f) a code segment that outputs the capability level.
- 15 8. The computer program as set forth in claim 7, wherein the capability levels are each achieved upon the ratings of the process attributes of the capability level surpassing a predetermined amount.
9. The computer program as set forth in claim 7, wherein each capability level is defined by the process attributes of a lower capability level and is further defined by at least one
- 20 more process attribute.
10. The computer program as set forth in claim 7, wherein the process attributes include process attributes selected from the group of process attributes consisting of process performance, performance management, work product management, process definition, process resource, process measurement, process control, continuous improvement, and
- 25 process change.
11. The computer program as set forth in claim 7, wherein the capability levels include capability levels selected from the group of capability levels consisting of performed informally, planned and tracked, well defined, quantitatively controlled, and continuously improving.

12. The computer program as set forth in claim 7, and further comprising a code segment that gauges a maturity of an operations organization based on the outputted capability level.
13. A system for determining capability levels of a process area in an operational maturity investigation comprising:
- 5 (a) logic that defines a plurality of process attributes;
- (b) logic that defines a plurality of generic practices for each of the process attributes;
- (c) logic that defines a plurality of capability levels in terms of groups of the process attributes;
- (d) logic that rates each of the process attributes based on achievement of the corresponding
10 generic practices;
- (e) logic that determines which of the capability levels is achieved by a process area based on the rating of the process attributes of the capability levels; and
- (f) logic that outputs the capability level.
14. The system as set forth in claim 13, wherein the capability levels are each achieved upon
15 the ratings of the process attributes of the capability level surpassing a predetermined amount.
15. The system as set forth in claim 13, wherein each capability level is defined by the process attributes of a lower capability level and is further defined by at least one more process attribute.
- 20 16. The system as set forth in claim 13, wherein the process attributes include process attributes selected from the group of process attributes consisting of process performance, performance management, work product management, process definition, process resource, process measurement, process control, continuous improvement, and process change.
- 25 17. The system as set forth in claim 13, wherein the capability levels include capability levels selected from the group of capability levels consisting of performed informally, planned and tracked, well defined, quantitatively controlled, and continuously improving.

18. The system as set forth in claim 13, and further comprising logic that gauges a maturity of an operations organization based on the outputted capability level.

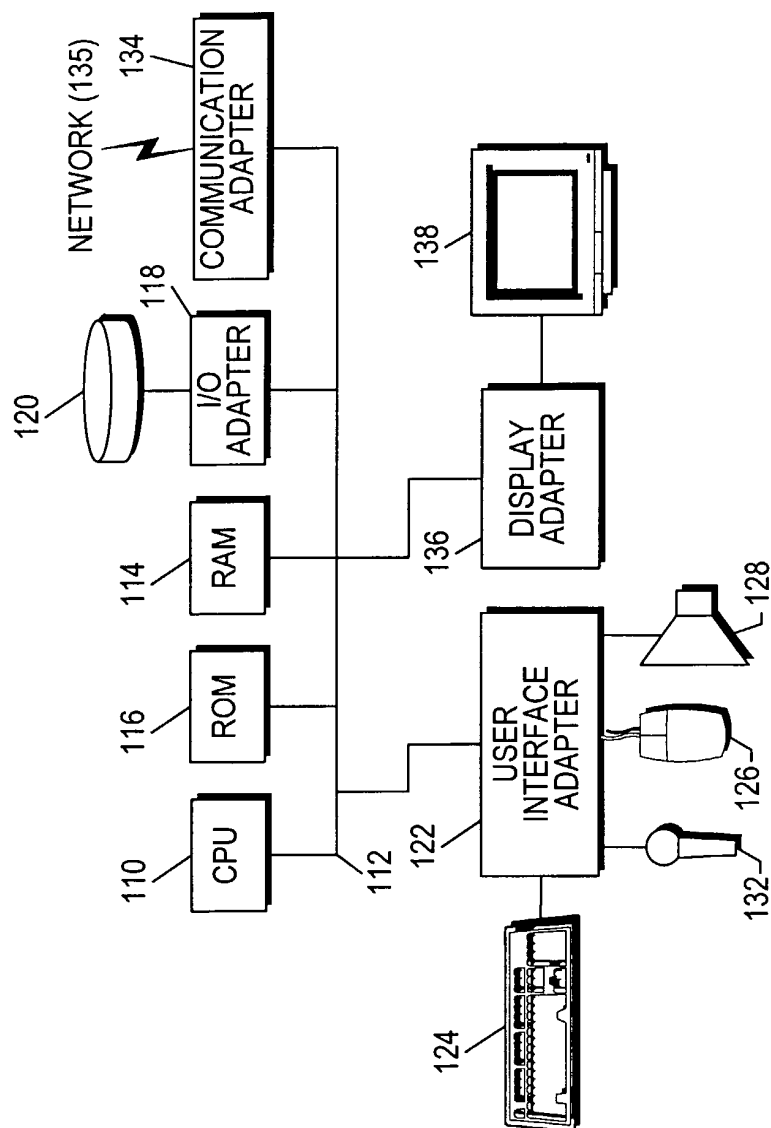


Figure 1

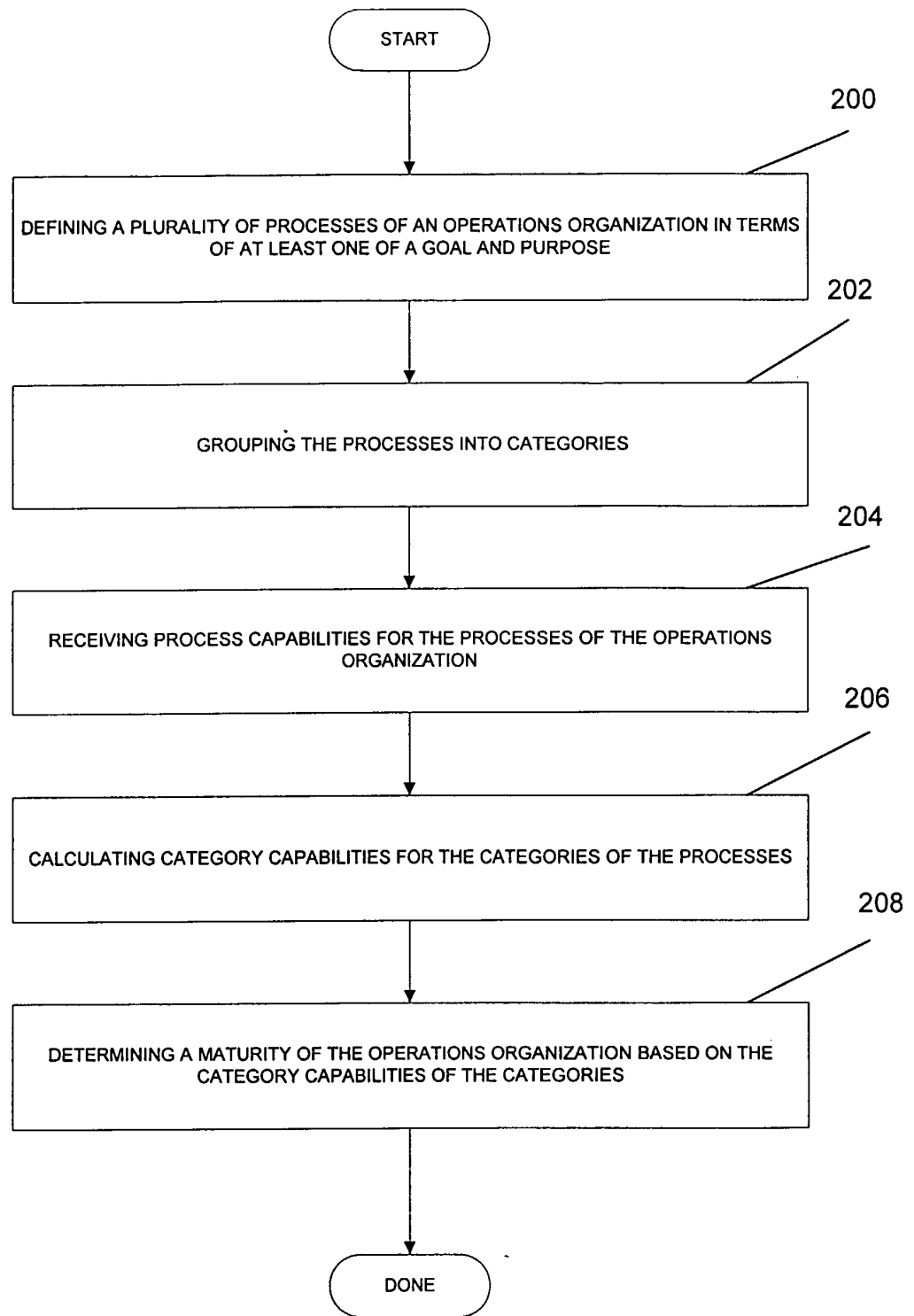


Figure 2

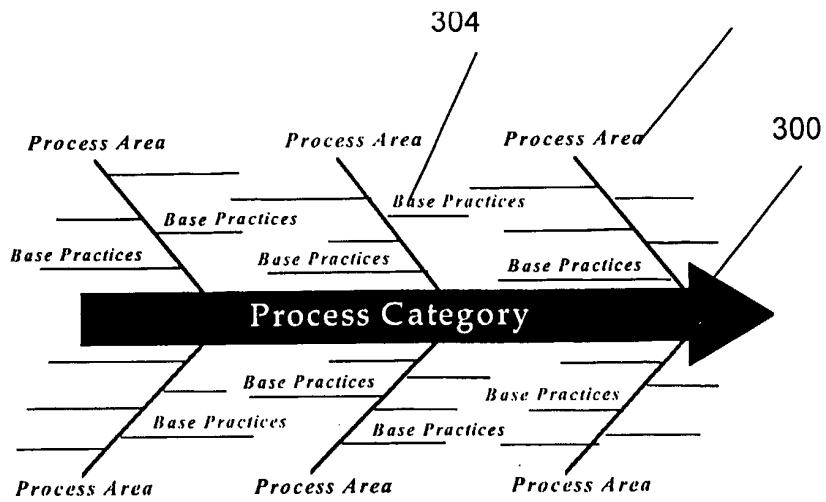


Figure 3

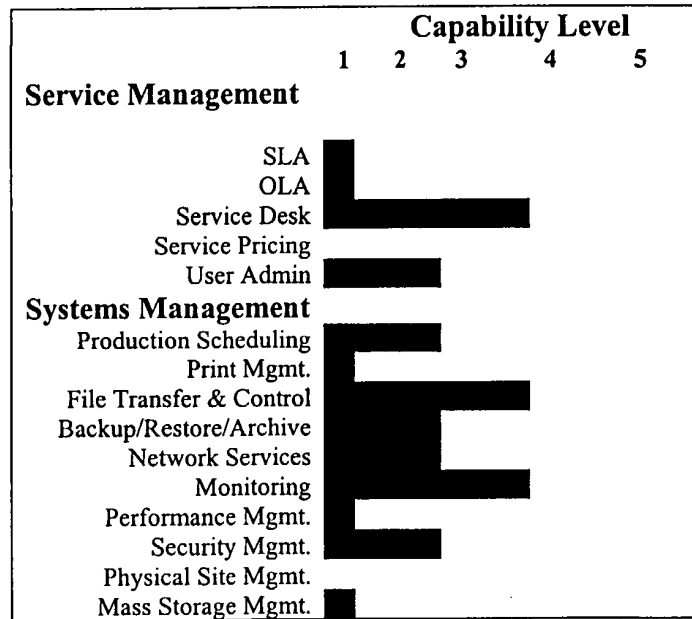


Figure 4

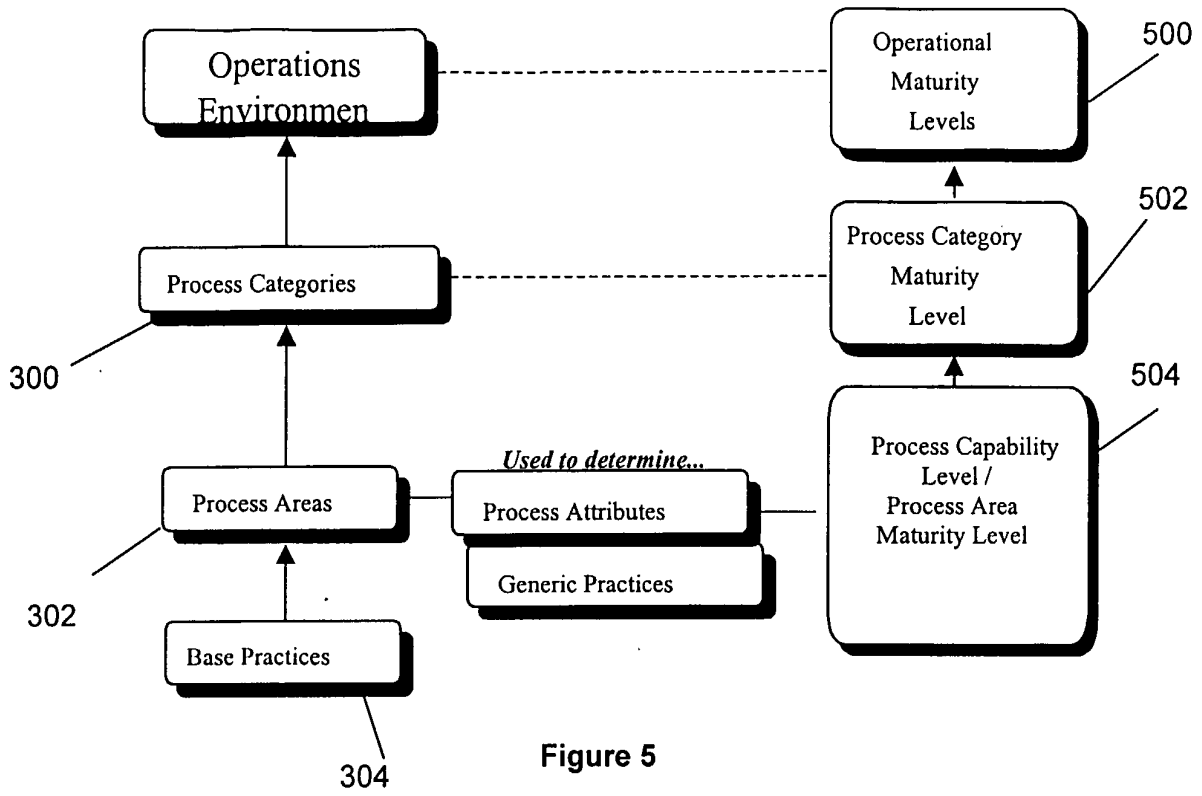


Figure 5

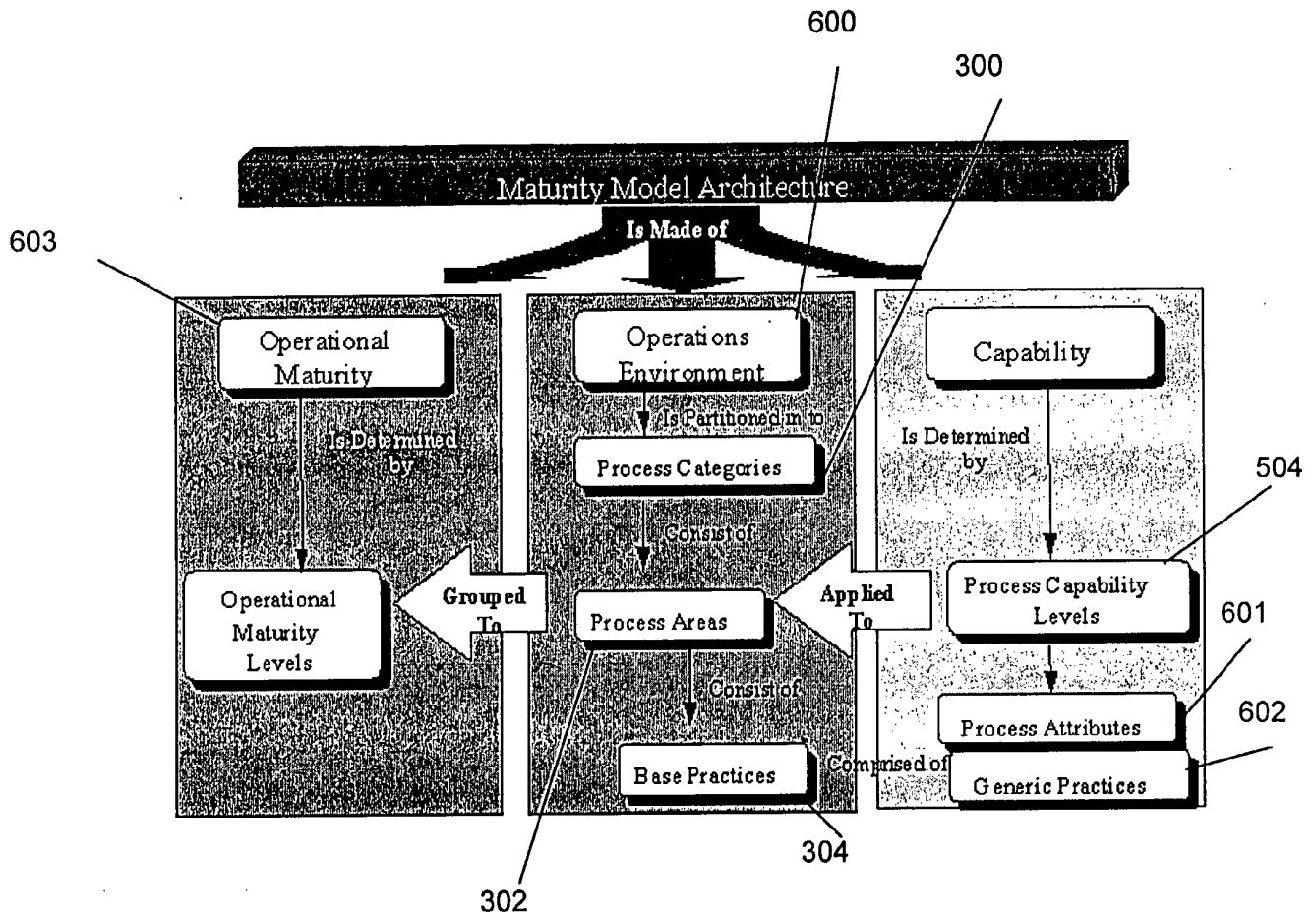


Figure 6

Capability Level	Process Attributes	Generic Practices
Level 1: Performed Informally	Process Performance	GP1.1 Ensure that Base Practices are performed
Level 2: Planned and Tracked	Performance Management	GP2.1 Establish and maintain a policy for performing operational tasks GP2.2 Allocate sufficient resources to meet expectations GP2.3 Ensure personnel receive the appropriate type and amount of training. GP2.4 Collect data to measure performance GP2.5 Maintain communication among team members
	Work Product Management	GP2.6 Ensure work products satisfy documented requirements GP2.7 Employ version control to manage changes to work products
Level 3: Well Defined	Process Definition	GP3.1: Define policies and procedures at an IT level GP3.2: Define tasks that satisfy the process purpose and business goals consistently and repeatedly
	Process Resource	GP3.3 Plan for human resources proactively GP3.4 Provide feedback in order to maintain knowledge and experience
Level 4: Quantitatively Controlled	Process Measurement	GP4.1 Establish measurable quality objectives for the operations environment GP4.2 Automate data collection GP4.3 Provide adequate resources and infrastructure for data collection
	Process Control	GP4.4 Use data analysis methods and tools to manage and improve the process
Level 5: Continuously Improving	Continuos Improvement	GP5.1: Continually improve tasks and processes
	Process Change	GP5.2: Deploy "best practices" across the IT organization

Figure 7

Rating	Key	Description
Not Achieved	N	There is no evidence of achievement of the defined attributes
Partially Achieved	P	There is some achievement of the defined attributes
Largely Achieved	L	There is significant achievement of the defined attributes
Fully Achieved	F	There is full achievement of the defined attributes

Figure 8

Capability Level	Process Attributes	Rating
Level 1: Performed Informally	Process Performance	Largely or Fully
Level 2: Planned and Tracked	Process Performance Performance Management Work Product Mgmt.	Fully Largely or Fully Largely of Fully
Level 3: Well Define	Process Performance Performance Management Work Product Mgmt. Process Definition Process Resource	Fully Fully Fully Largely or Fully Largely of Fully
Level 4: Quantitatively Controlled	Process Performance Performance Management Work Product Mgmt. Process Definition Process Resource Process Measurement Process Control	Fully Fully Fully Fully Fully Largely or Fully Largely of Fully
Level 5: Continuously Improving	Process Performance Performance Management Work Product Mgmt. Process Definition Process Resource Process Measurement Process Control Continuos Improvement Process Change	Fully Fully Fully Fully Fully Fully Fully Largely or Fully Largely of Fully

Figure 9

<p>Client Sponsor</p> <ul style="list-style-type: none"> • Commit to Assessment • Outlines business goals • Notifies Assessment team lead of any continuous improvement activities currently in place • Work with Assessment Team Lead to reach common understanding of assessment goals, scope, constraints, roles and responsibilities, and outputs • Assist in selection of assessment participants • Approves assessment plan • Attend Kick-off meeting, Initial and Final Results Presentations • Own assessment results
<p>Assessment Participants</p> <ul style="list-style-type: none"> • Complete maturity questionnaires • Attend Kick-off meeting, Initial and Final Results Presentations • Attend meetings and interviews • Provide access to relevant documents, work products, etc.
<p>Assessment Team Lead</p> <ul style="list-style-type: none"> • Administer maturity questionnaires and examine responses • Plan and lead Kick Off meeting • Assign responsibilities for assessment tasks • Prepare exploratory questions based on Interview Aids. • Facilitate interviews • Manage adherence to the assessment process and schedule • Plan and lead Initial Findings presentation • Lead effort to consolidate, rate and prepare final findings: review data on generic practices and assessment indicators to determine rating of process attributes. • Plan and lead Final Findings presentation • Plan and lead Executive session • Collect and bundle feedback from assessment participants and assessment team. • Lead Assessment Team debrief
<p>Assessment Team Members</p> <ul style="list-style-type: none"> • Attend OMM training • Assist in selection of assessment participants • Attend planning sessions, establish ground rules for assessment • Administer maturity questionnaires, and examine responses • Conduct initial document review • Prepare exploratory questions based on Interview Aids. • Participate in interviews • Review notes; identify and classify significant data obtained during interviews and document review, identify additional information required • Consolidate, Rate and Prepare final findings; review data on generic practices and assessment indicators to determine rating of process attributes • Participate in Assessment Team debrief

Figure 10

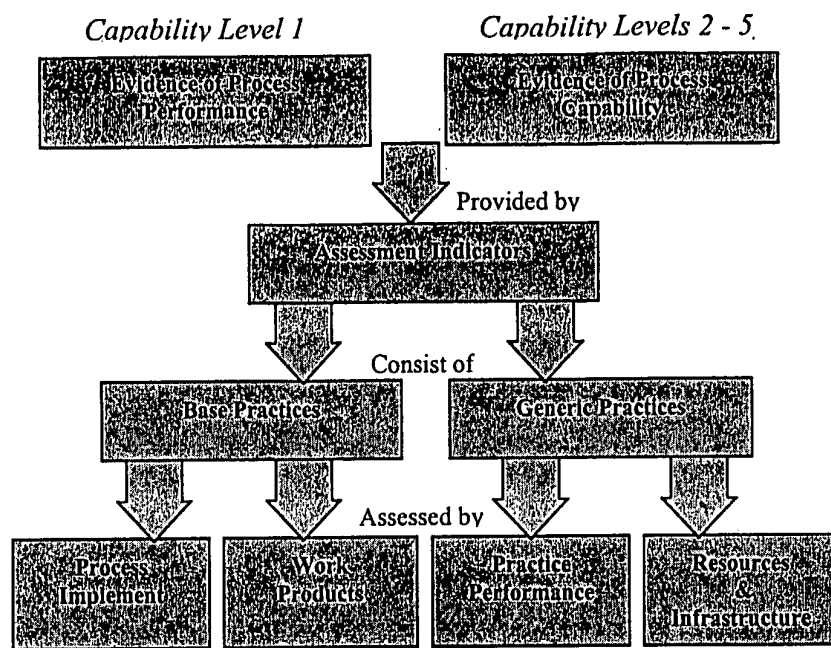


Figure 11