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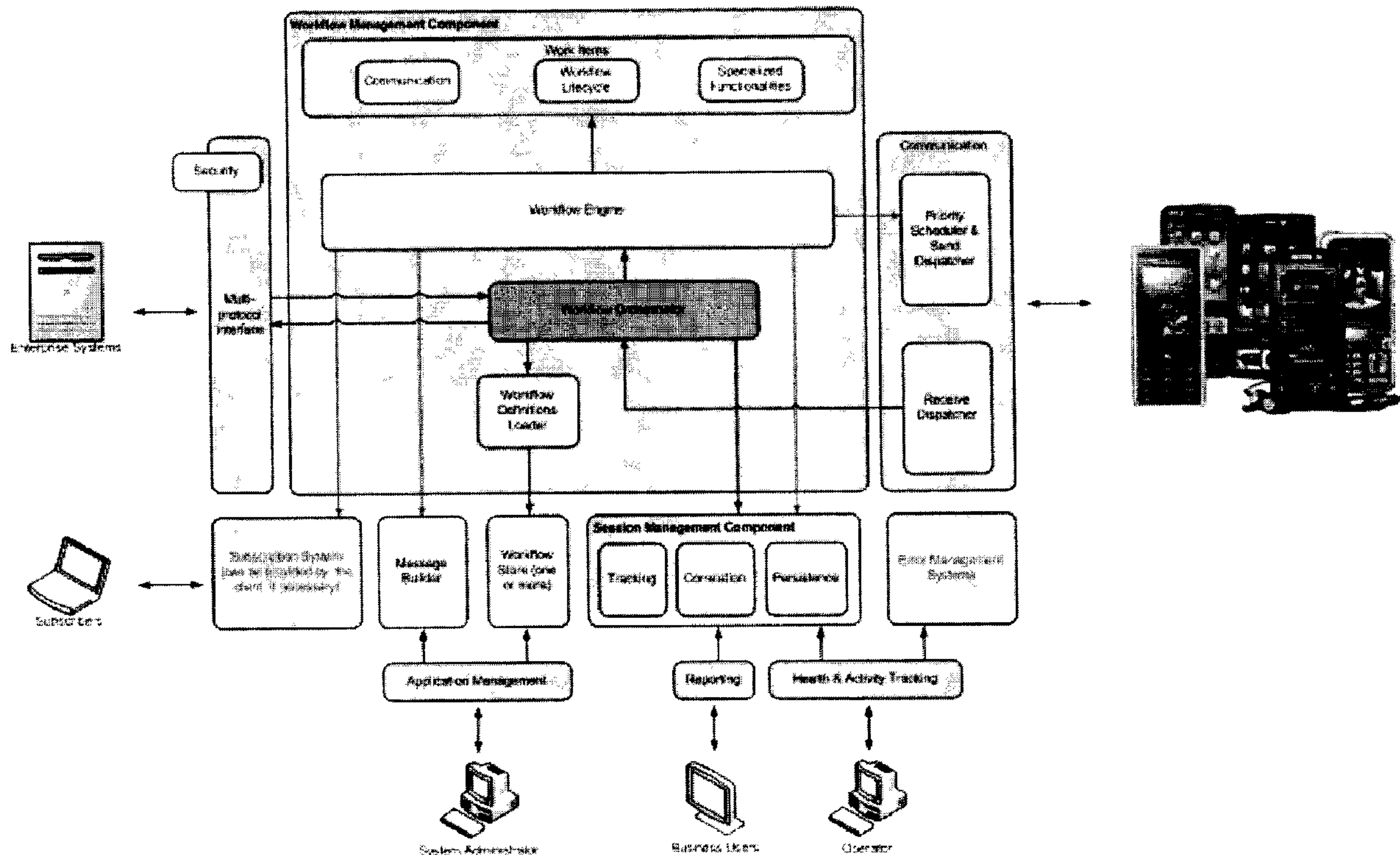
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(54) Titre : SYSTEME DE COMMUNICATIONS BIDIRECTIONNELLES PAR CANAUX MULTIPLES POUR LA GESTION D'UN CIRCUIT DE TRAVAIL

(54) Title: SYSTEM FOR BI-DIRECTIONAL COMMUNICATION ACROSS MULTIPLE COMMUNICATION CHANNELS FOR A WORKFLOW



(57) Abrégé/Abstract:

The present disclosure is directed to a system for bi-directional communication across multiple communication channels for a workflow. The system includes a workflow management component and a session management component. The workflow management component receives a message from an external system and creates an instance of a workflow based on the message. The session management component transmits a first communication to a first device via a first communication channel,



(57) **Abrégé(suite)/Abstract(continued):**

correlates the first communication to the instance of the workflow, receives a second communication from the first device, correlates the second communication to the instance of the workflow, transmits a third communication to a second device via a second communication channel, and correlates the third communication to the instance of the workflow.

## **SYSTEM FOR BI-DIRECTIONAL COMMUNICATION ACROSS MULTIPLE COMMUNICATION CHANNELS FOR A WORKFLOW**

### **ABSTRACT**

The present disclosure is directed to a system for bi-directional communication across multiple communication channels for a workflow. The system includes a workflow management component and a session management component. The workflow management component receives a message from an external system and creates an instance of a workflow based on the message. The session management component transmits a first communication to a first device via a first communication channel, correlates the first communication to the instance of the workflow, receives a second communication from the first device, correlates the second communication to the instance of the workflow, transmits a third communication to a second device via a second communication channel, and correlates the third communication to the instance of the workflow.

# **SYSTEM FOR BI-DIRECTIONAL COMMUNICATION ACROSS MULTIPLE COMMUNICATION CHANNELS FOR A WORKFLOW**

## FIELD

The present application is generally directed to a system for bi-directional communication across multiple communication channels for a workflow and a method directed to using the system.

## **SUMMARY OF THE DISCLOSURE**

In one aspect, the present disclosure is directed to a system for bi-directional communication across multiple communication channels for a workflow. The system includes a workflow management component and a session management component. The workflow management component receives a message from an external system and creates an instance of a workflow based on the message. The session management component transmits a first communication to a first device via a first communication channel, correlates the first communication to the instance of the workflow, receives a second communication from the first device, correlates the second communication to the instance of the workflow, transmits a third communication to a second device via a second communication channel, and correlates the third communication to the instance of the workflow.

## BRIEF DESCRIPTION OF THE DRAWING

The foregoing and other objects, aspects, features, and advantages of the present invention will become more apparent and better understood by referring to the following description taken in conjunction with the accompanying drawing, in which:

FIG. 1 is a block diagram that depicts an embodiment of a system for bi-directional communication across multiple communication channels for a workflow; and

FIGS. 2 and 3 are an exemplary sequence diagrams that depict the operation of the system of FIG. 1.

## DETAILED DESCRIPTION OF CERTAIN EMBODIMENTS

The present disclosure is directed to a system for bi-directional communication across multiple communication channels for a workflow. In general overview, an external system can transmit a message that requests the system to start an instance of a particular workflow. In response, the workflow management component of the system can execute an instance of the workflow. As the workflow executes, the session management component of the system can maintain the workflow's persistence. In particular, the session management component can correlate incoming and outgoing communications from different communication channels with the workflow. In this manner, the system enables external systems to leverage the features of different communication channels for achieving more effective workflows.

FIG. 1 is a block diagram that depicts an embodiment of the system. As depicted, the system includes a workflow management component and a session management component. The workflow management component can be responsible for the execution of workflows and can provide related services to external systems, such as enterprise systems. With such services, the external systems can request the workflow management component to start an instance of a workflow, direct a message to a particular workflow instance, and abort the execution of the workflow instance.

The workflow management component operates using a workflow orchestrator, workflow definition loader, workflow execution engine, and work items. The workflow orchestrator can coordinate and/or direct the different elements of the workflow management component and their interactions with entities external to the system. For example, the workflow orchestrator can use the workflow definition loader to load configured workflow definition files into the workflow execution engine. In another example, the workflow orchestrator can use the correlation service provided by the session management component, described in further detail below, to redirect messages to particular workflow instances.

In further detail, the workflow definition loader can load workflow definition files into the workflow execution engine for later execution. In some embodiments, the workflow definition loader locates workflow definition files via custom XML files. The XML files can provide the URLs of the workflow definition file store and the URLs of the workflows to load within those stores. A workflow definition file can provide a map between workflow friendly names and internal names. In some embodiments, the workflow definition file can define the

name of a variable that holds the execution results of a workflow for later retrieval by an external system. Exemplary file types for the workflow definition files include Drools flow and rule files and BPMN (Business Process Management Notation).

The workflow execution engine can execute the workflows. The workflow execution engine can support multiple instances of the same workflow while being able to distinguish between the instances. When launching an instance of a workflow, the workflow execution engine use custom parameters. The workflow execution engine can allow sending arbitrary events to executing workflow instances, with the option to pass event data along. Further, the workflow execution engine can allow aborting the execution of a particular workflow instance.

The workflow execution engine can use work items. In some embodiments, work items can be specialized components that allow workflows to communicate with external systems, by way of example, or to perform domain-specific tasks. When a workflow requires a work item, the workflow execution engine can invoke the class corresponding to the item to perform the work.

Work items directed to communications can facilitate communications with computing devices, such as mobile devices. In various embodiments, such work items can be directed to text messages (e.g., SMS, MMS), mobile sites, e-mail, interactive voice response (IVR), or geolocation. Workflow lifecycle/utilities work items can manage the workflow lifecycle. For example, these work items can create or delete correlations, manage subscription information, build messages, or perform logging. Some work items can have specialized functions, such as barcode scanning or payment. Additionally, custom work items can be developed for domain-specific needs.

The session management component provides information and/or services to the workflow management component to deliver an execution environment and a persistence environment. In particular, the session management component can be responsible for the persistence of workflow instances/sessions by capturing outgoing or incoming events and relating each event to a particular workflow instance. The session management component can also provide persistence services, allowing retrieval of information about a particular session (e.g., start time, end time, exchanges, execution results).

The session management component operates using session logging, a correlation service, workflow persistence, and a tracking service. The session logging element can log events in a workflow session. Exemplary events include the session start, session outgoing messages, session incoming messages, and the session end. Through the logging, information about a workflow session and/or execution results can remain available even after the session has ended.

The correlation service enables the workflow management component to relate an incoming event to a specific workflow instance, thus allowing the reception of the event by the correct workflow instance. The correlation service provides facilities to register a new correlation (usually from a workflow), get the workflow instance ID related to a particular event (e.g. a text message from a specific phone number directed to the workflow instance waiting for a message from that phone number), and delete correlations that are no longer needed.

Communications with mobile stations (e.g., text messaging, mobile) and different other media (e.g., email, IVR, web sites) are “stateless” by nature. With the system of the present disclosure, a communication session becomes “stateful” because the session management component can follow a session through multiple communication channels. Both the correlation service and the “Create Correlation” work item enable this result.

Workflow persistence can store workflow execution information in order to be able to resume a workflow instance after a server restart. The tracking service can offer the option to track workflow executions. In particular, the service can track execution at the node level within workflows, optionally logging the workflow internal state in the process. The tracking service can be switched on and off, and the service can enable debugging of workflow execution.

FIGS. 2 and 3 are exemplary sequence diagrams that depict the operation of the system of FIG. 1.

In view of the structure, functions and apparatus of the systems and methods described herein, the present disclosure provides an efficient and intelligent system for bi-directional communication across multiple communication channels for a workflow. Having described certain embodiments of methods and systems for such bi-directional communication, it will now become apparent to one of skill in the art that other embodiments incorporating the

concepts of the disclosure may be used. Therefore, the invention should not be limited to certain embodiments, but should encompass the spirit and scope of the claims.

What is claimed:

1. A system for bi-directional communication across multiple communication channels for a workflow comprising:

a workflow management component and a session management component, wherein the workflow management component

receives a message from an external system, and

creates an instance of a workflow based on the message; and

the session management component

transmits a first communication to a first device via a first communication channel,

correlates the first communication to the instance of the workflow,

receives a second communication from the first device,

correlates the second communication to the instance of the workflow,

transmits a third communication to a second device via a second communication channel, and

correlates the third communication to the instance of the workflow.

2. A method for communicating bi-directionally across multiple communication channels for a workflow comprising:

receiving, by a workflow management component, a message from an external system; creating, by the workflow management component, an instance of a workflow based on the message;

transmitting, by a session management component, a first communication to a first device via a first communication channel;

correlating, by the session management component, the first communication to the instance of the workflow;

receiving, by the session management component, a second communication from the first device;

correlating, by the session management component, the second communication to the instance of the workflow;

transmitting, by the session management component, a third communication to a second device via a second communication channel; and  
correlating, by the session management component, the third communication to the instance of the workflow.

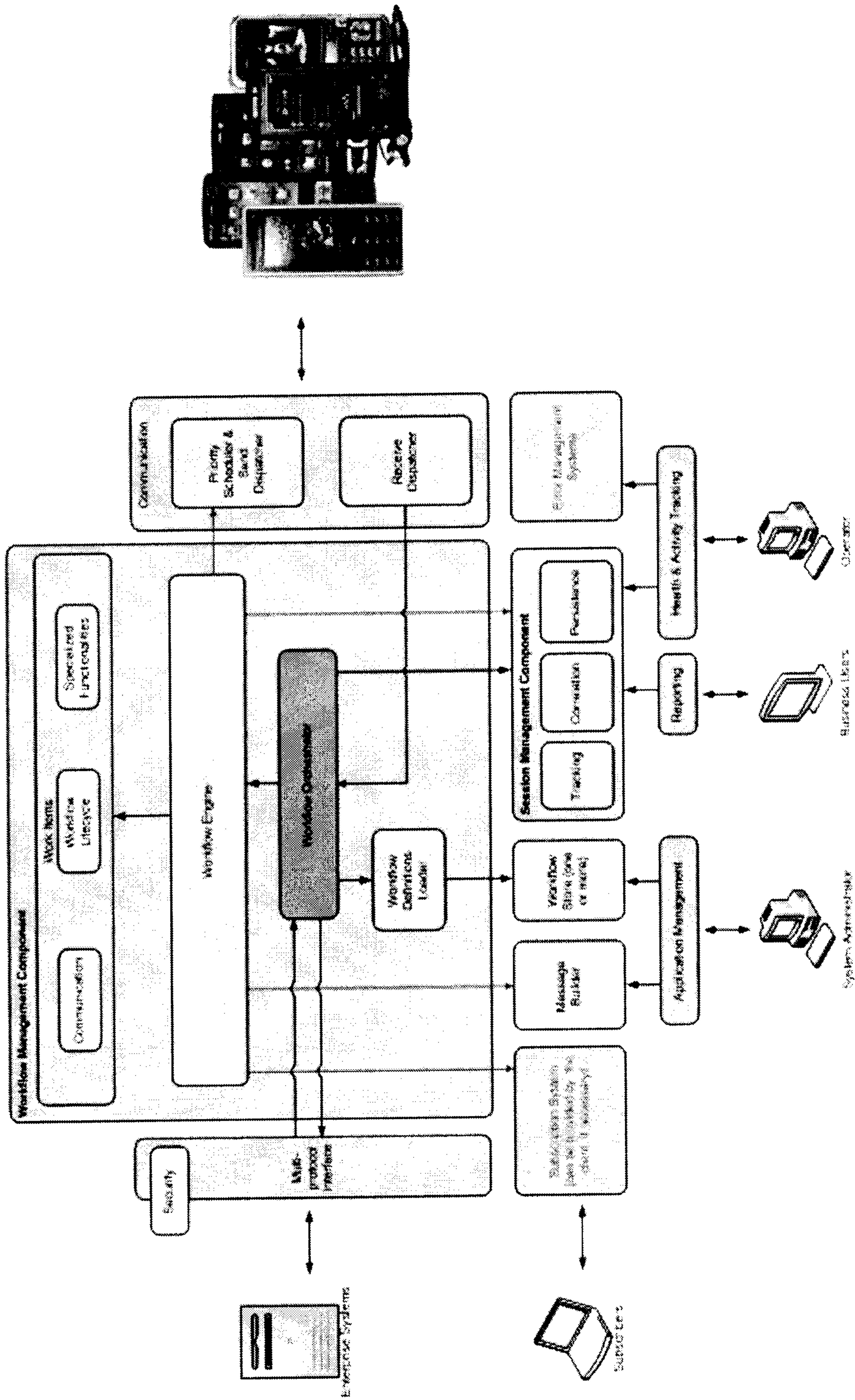


FIG. 1

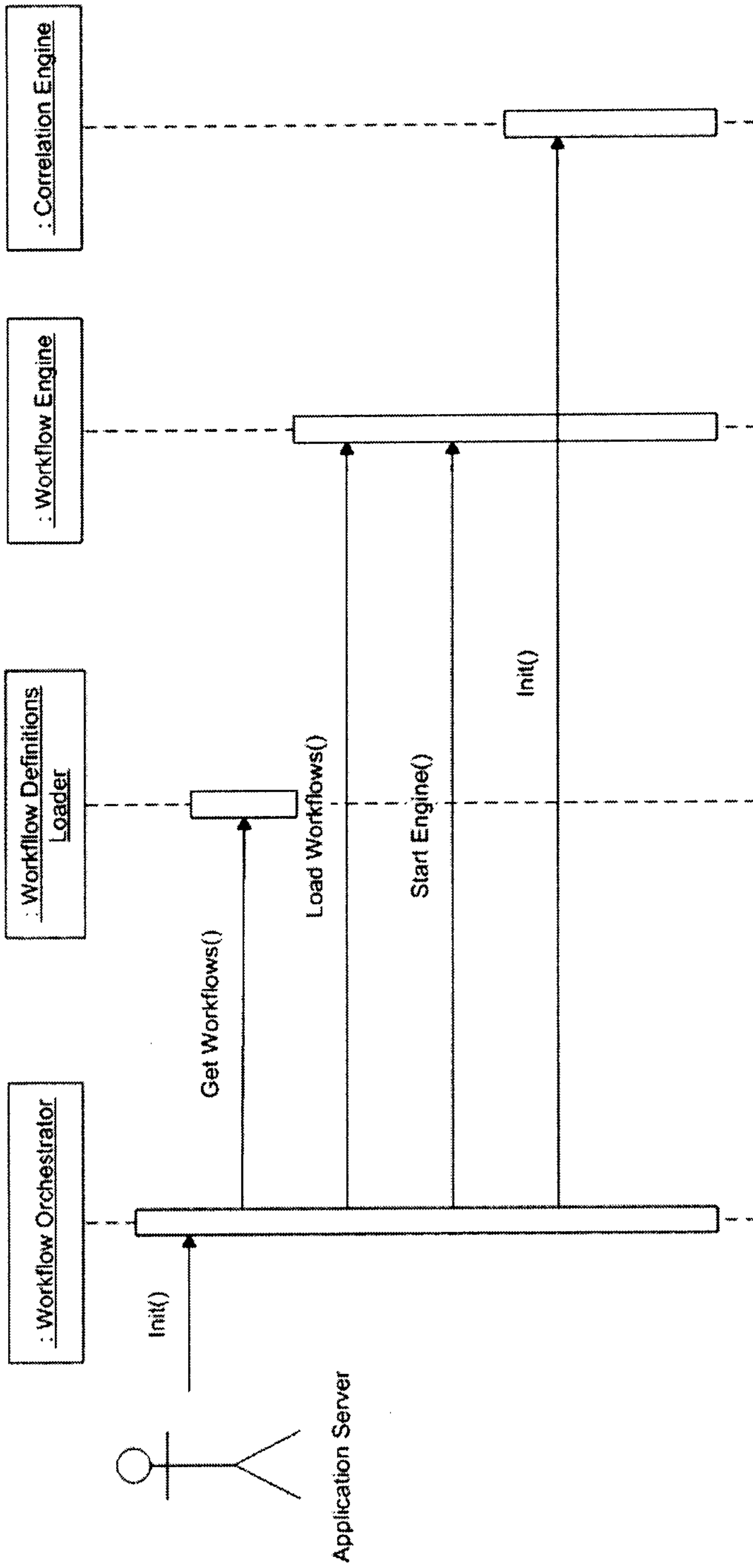


FIG. 2

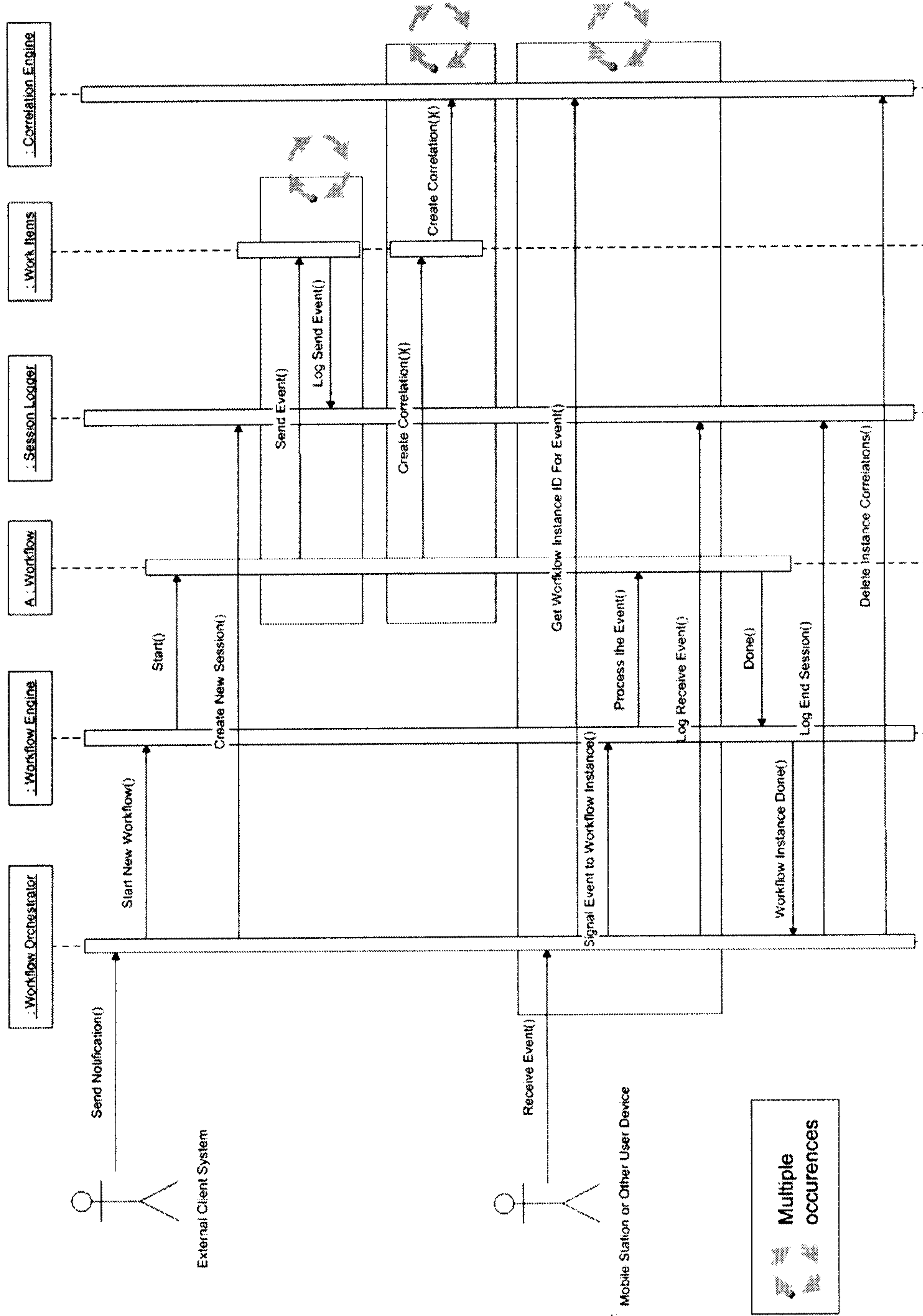


FIG. 3

