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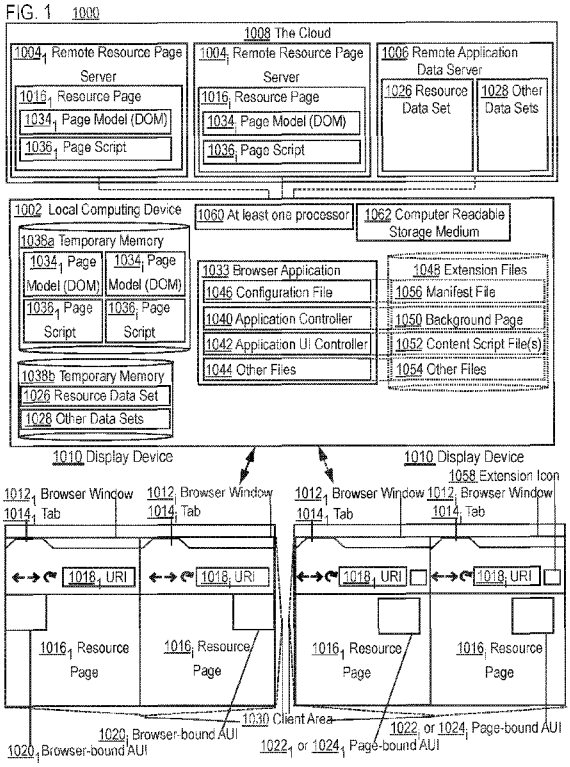
[Continued on next page]

(54) Title: DIGITAL RESOURCE MANAGEMENT SYSTEM

FIG. 1



(57) Abstract: A process controls navigation and presentation of digital resources. Different resources or viewing components associated with viewing areas may be assigned different visual designators that affect how the digital resources are processed and presented. A user interface enables automatic generation of an array of resources that causes resources to be displayed in a particular predefined way based on their visual designators. When multiple resources are concurrently displayed in such an array, navigating from one resource to another may also cause automatic navigation to another resource having a known association with the resource to which navigation is requested. Thus, the system beneficially presents the user with a contextual resource relevant to the resource to which navigation is requested, and may enable the user to concurrently view these resources in a convenient manner.

WO 2017/074963 A1

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DIGITAL RESOURCE MANAGEMENT SYSTEM

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Application Nos. 62/246,522 filed October 26, 2015; 62/321,706 filed April 12, 2016; 62/340,940 filed May 24, 2016; and 62/393,594 filed September 12, 2016, all of which are incorporated by reference in their entirety.

BACKGROUND

TECHNICAL FIELD

[0002] The present disclosure relates to generally to digital resource management and more specifically to controlling navigation and presentation of digital resources in a computing system.

DESCRIPTION OF RELATED ART

[0003] There are billions of digital information resources available on computing devices, including those on computer networks such as the World Wide Web. A digital information resource can be hosted independently of other digital information resources on a computer network by being stored at a unique location defined by a unique Uniform Resource Identifier (URI). Each of these independently hosted digital information resources may provide unique and valuable content and/or functions.

[0004] Frequently, users may want to group and display one or more digital information resources as a defined, cohesive, and, at times, explicitly sequential hosted resource set. A user can present these digital information resource sets either to an external audience or to him/herself; the latter act often constituting study or review.

SUMMARY

[0005] In an embodiment, a method controls navigation between digital resources in an application executing on a client device in a networked computer environment. A memory of the client device stores identifiers for at least a first digital resource, a second digital resource, a third digital resource, and a fourth digital resource. The first and third digital resources are in a first ordered set of digital resources. The second digital resource is in a second ordered set of digital resources and the fourth digital resource is in a third ordered set of digital resources. The fourth digital resource has a stored association with the third digital resource.

The first digital resource of the first ordered set of digital resources is displayed in a first digital resource viewing component and the second digital resource of the second ordered set of digital resources is displayed in a second digital resource viewing component. A processor of the client device causes a display device to display a user interface element for navigating between the digital resources. The processor detects a selection of the user interface element. Responsive to the selection of the user interface element, the processor initiates navigation from the first digital resource to the third digital resource of the first ordered set of digital resources in the first digital resource viewing component. The processor detects the stored association between the third digital resource and the fourth digital resource. Responsive to detecting the stored association, the processor initiates navigation from the second digital resource of the second ordered set of digital resources to the fourth digital resource of the third ordered set of digital resources in the second digital resource viewing component.

[0006] In another embodiment, a method generates a visual array of digital resources. A memory of the client device stores first parameters defining a first viewing area of a display and second parameters defining a second viewing area of a display. The memory stores identifiers for each of a first ordered set of digital resources and each of a second ordered set of digital resources. Furthermore, the memory stores a first data element associating each of the first ordered set of digital resources with the first viewing area. The memory also stores a second data element associating each of the second ordered set of digital resources with the second viewing area. A processor of the client device causes the display to display a user interface element for generating the visual array. The processor detects a selection of the user interface element. Responsive to the selection of the user interface element, the processor identifies for inclusion in the visual array, at least a first digital resource from the first ordered set of digital resources and a second digital resource from the second ordered set of digital resources. The processor also identifies the first data element corresponding to the first digital resource and determines that the first data element associates the first digital resource with the first viewing area. Responsive to determining that the first data element associates the first digital resource with the first viewing area, the processor causes a first digital resource viewing component displaying the first digital resource to be positioned over the first viewing area of the display. The processor identifies the second data element corresponding to the second digital resource and determines that the second data element associates the second digital resource with the second viewing area. Responsive to determining that the second data element associates the second digital resource with the second viewing area, the processor causes a second digital resource viewing component

displaying the second digital resource to be positioned over the second viewing area of the display.

[0007] In yet another embodiment, a method generates a visual array of digital resources. A memory of the client device stores first parameters defining a first viewing area of a display and second parameters defining a second viewing area of a display. The memory furthermore stores identifiers for a first digital resource viewing component and a second digital resource viewing component. The memory also stores a first data element associating the first digital resource viewing component with the first viewing area. The memory furthermore stores a second data element associating the second digital resource viewing component with the second viewing area. The memory furthermore stores an association between the first digital resource viewing component and second digital resource viewing component. A processor of the client device causes the display to display a user interface element for generating the visual array. The processor detects a selection of the user interface element. Responsive to the selection of the user interface element, the processor identifies for inclusion in the visual array, at least the first digital resource viewing component. The processor also identifies the first data element corresponding to the first digital resource viewing component and determines that the first data element associates the first digital resource viewing component with the first viewing area. Responsive to determining that the first data element associates the first digital resource viewing component with the first viewing area, the processor causes the first digital resource viewing component displaying a first digital resource to be positioned over the first viewing area of the display. The processor detects that the second digital resource viewing component is associated with the first digital resource viewing component. Responsive to detecting the second digital resource viewing component is associated with the first digital resource viewing component, the processor identifies for inclusion in the visual array the second digital resource viewing component. The processor identifies the second data element corresponding to the second digital resource viewing component and determines that the second data element associates the second digital resource viewing component with the second viewing area. Responsive to determining that the second data element associates the second digital resource viewing component with the second viewing area, the processor causes the second digital resource viewing component displaying a second digital resource to be positioned over the second viewing area of the display.

[0008] In another embodiment, a non-transitory computer-readable storage medium stores instructions that when executed by a processor causes the processor to perform any of the processes or process steps described above.

[0009] In yet another embodiment, a computer device comprises a processor and a non-transitory computer-readable storage medium stores instructions that when executed by a processor causes the processor to perform any of the processes or process steps described above.

Brief Description Of The Drawings

[0010] The disclosed embodiments have other advantages and features which will be more readily apparent from the detailed description, the appended claims, and the accompanying figures (or drawings). A brief introduction of the figures is below.

[0011] FIG. 1 is a block diagram illustrating a first example embodiment of a system for enabling generation and management of an array of digital resources in a networked computer environment.

[0012] FIG. 2 is a block diagram illustrating a second example embodiment of a system for enabling generation and management of an array of digital resources in a networked computer environment.

[0013] FIG. 3 is a graphical representation of a first example embodiment of an array management complex component central to the generation and management functions of an array of digital resources in a networked computer environment.

[0014] FIG. 4 is a graphical representation of a second example embodiment of an array management complex component central to the generation and management functions of an array of digital resources in a networked computer environment.

[0015] FIG. 5 is a graphical representation of an example embodiment of data elements used to visually designate digital resources of an array.

[0016] FIG. 6 is a graphical representation of a first example embodiment of parameters used to define viewing areas for digital resources an array of digital resources.

[0017] FIG. 7 is a graphical representation of a second example embodiment of parameters used to define viewing areas for digital resources an array of digital resources.

[0018] FIG. 8 is a block diagram illustrating a first example embodiment of viewing areas for digital resources an array of digital resources.

[0019] FIG. 9 is a block diagram illustrating a second example embodiment of viewing areas for digital resources an array of digital resources.

[0020] FIG. 10 is a graphical representation of data that may be associated with digital resources of an array.

[0021] FIG. 11 is a graphical representation of matching digital resources to viewing areas by a common data element.

[0022] FIG. 12 is a graphical representation of a first state of a first example embodiment of a data management system used to track and manage data and viewing components of digital resources of an array.

[0023] FIG. 13 is a graphical representation of a second state of a first example embodiment of a data management system used to track and manage data and viewing components of digital resources of an array.

[0024] FIG. 14 is a graphical representation of a third state of a first example embodiment of a data management system used to track and manage data and viewing components of digital resources of an array.

[0025] FIG. 15 is a graphical representation of a fourth state of a first example embodiment of a data management system used to track and manage data and viewing components of digital resources of an array.

[0026] FIG. 16 is a graphical representation of a fifth state of a first example embodiment of a data management system used to track and manage data and viewing components of digital resources of an array.

[0027] FIG. 17 is a graphical representation of a first state of a second example embodiment of a data management system used to track and manage data and viewing components of digital resources of an array.

[0028] FIG. 18 is a graphical representation of a second state of a second example embodiment of a data management system used to track and manage data and viewing components of digital resources of an array.

[0029] FIG. 19 is a graphical representation of a third state of a second example embodiment of a data management system used to track and manage data and viewing components of digital resources of an array.

[0030] FIG. 20 is a graphical representation of a fourth state of a second example embodiment of a data management system used to track and manage data and viewing components of digital resources of an array.

[0031] FIG. 21 is a graphical representation of a fifth state of a second example embodiment of a data management system used to track and manage data and viewing components of digital resources of an array.

[0032] FIG. 22 is a block diagram illustrating a first example embodiment of user interface components, functional modules, and messaging for digital resource navigation and array generation using a browser-bound dynamic navigation user interface in a single browser window.

[0033] FIG. 23 is a block diagram illustrating a first example embodiment of user interface components, functional modules, and messaging for digital resource navigation, array generation, and responsive action using a browser-bound dynamic navigation user interface in multiple browser windows.

[0034] FIG. 24 is a block diagram illustrating a second example embodiment of user interface components, functional modules, and messaging for digital resource navigation and array generation using a browser-bound dynamic navigation user interface in a single browser window.

[0035] FIG. 25 is a block diagram illustrating a second example embodiment of user interface components, functional modules, and messaging for digital resource navigation, array generation, and responsive action using a browser-bound dynamic navigation user interface in multiple browser windows.

[0036] FIG. 26 is a block diagram illustrating a first example embodiment of user interface components, functional modules, and messaging for digital resource navigation and array generation using a page-bound dynamic navigation user interface in a single browser window.

[0037] FIG. 27 is a block diagram illustrating a first example embodiment of user interface components, functional modules, and messaging for digital resource navigation, array generation, and responsive action using a page-bound dynamic navigation user interface in multiple browser windows.

[0038] FIG. 28 is a block diagram illustrating a second example embodiment of user interface components, functional modules, and messaging for digital resource navigation and array generation using a page-bound dynamic navigation user interface in a single browser window.

[0039] FIG. 29 is a block diagram illustrating a second example embodiment of user interface components, functional modules, and messaging for digital resource navigation, array generation, and responsive action using a page-bound dynamic navigation user interface in multiple browser windows.

[0040] FIG. 30 is a block diagram illustrating a first example embodiment of user interface components and functional modules for implementing digital resource array generation and

management using a page-bound dynamic navigation user interface according to a general example.

[0041] FIG. 31 is a block diagram illustrating a second example embodiment of user interface components and functional modules for implementing digital resource array generation and management using a page-bound dynamic navigation user interface according to a general example.

[0042] FIG. 32 is a block diagram illustrating a third example embodiment of user interface components and functional modules for implementing digital resource array generation and management using a page-bound dynamic navigation user interface according to a general example.

[0043] FIG. 33 is a block diagram illustrating a fourth example embodiment of user interface components and functional modules for implementing digital resource array generation and management using a page-bound dynamic navigation user interface according to a general example.

[0044] FIG. 34 is a block diagram illustrating a fifth example embodiment of user interface components and functional modules for implementing digital resource array generation and management using a page-bound dynamic navigation user interface according to a general example.

[0045] FIG. 35 is a block diagram illustrating a sixth example embodiment of user interface components and functional modules for implementing digital resource array generation and management using a page-bound dynamic navigation user interface according to a general example.

[0046] FIG. 36 is a block diagram illustrating a seventh example embodiment of user interface components and functional modules for implementing digital resource array generation and management using a page-bound dynamic navigation user interface according to a general example.

[0047] FIG. 37 is a block diagram illustrating a eighth example embodiment of user interface components and functional modules for implementing digital resource array generation and management using a page-bound dynamic navigation user interface according to a general example.

[0048] FIG. 38 is a block diagram illustrating a first example embodiment of user interface components and functional modules for implementing digital resource array generation and management using a page-bound dynamic navigation user interface according to an education example.

[0049] FIG. 39 is a block diagram illustrating a second example embodiment of user interface components and functional modules for implementing digital resource array generation and management using a page-bound dynamic navigation user interface according to an education example.

[0050] FIG. 40 is a block diagram illustrating a third example embodiment of user interface components and functional modules for implementing digital resource array generation and management using a page-bound dynamic navigation user interface according to an education example.

[0051] FIGs. 41A-41B are flowcharts illustrating an embodiment of a process for navigating between digital resources using a dynamic navigation user interface.

[0052] FIG. 42 is a flowchart illustrating an embodiment of a process for visually designating digital resources for display in an array of digital resources.

[0053] FIG. 43 is a flowchart illustrating an embodiment of a first process for generating an array of digital resources.

[0054] FIGs. 44A-44B are flowcharts illustrating a first embodiment of a second process for generating an array of digital resources.

[0055] FIGs. 45A-45B are flowcharts illustrating a second embodiment of a second process for generating an array of digital resources.

[0056] FIGs. 46A-46E are flowcharts illustrating a first embodiment of a third process for generating an array of digital resources.

[0057] FIGs. 47A-47E are flowcharts illustrating a second embodiment of a third process for generating an array of digital resources.

[0058] FIG. 48 is a flowchart illustrating an embodiment of a first process for creating and managing responsive actions between digital resources.

[0059] FIG. 49 is a flowchart illustrating a first embodiment of a second process for creating and managing responsive actions between digital resources.

[0060] FIG. 50 is a flowchart illustrating a second embodiment of a second process for creating and managing responsive actions between digital resources.

[0061] FIG. 51 is a flowchart illustrating a first embodiment of a third process for creating and managing responsive actions between digital resources.

[0062] FIG. 52 is a flowchart illustrating a first embodiment of a fourth process for creating and managing responsive actions between digital resources.

[0063] FIG. 53 is a flowchart illustrating a second embodiment of a fourth process for creating and managing responsive actions between digital resources.

DETAILED DESCRIPTION

[0064] The Figures (FIGS.) and the following description relate to various embodiments by way of illustration only. From the following discussion, alternative embodiments of the structures and methods disclosed herein will be readily recognized as viable alternatives that may be employed without departing from the principles of what is claimed.

[0065] Reference will now be made in detail to several embodiments, examples of which are illustrated in the accompanying figures. It is noted that wherever practicable similar or like reference numbers may be used in the figures and may indicate similar or like functionality. The figures depict embodiments of the disclosed system (or method) for purposes of illustration only. One skilled in the art will readily recognize from the following description that alternative embodiments of the structures and methods illustrated herein may be employed without departing from the principles described herein.

[0066] In a Resource Set Presentation Process (RSPP), a computer device enables a user to construct presentations from stored digital information resources, including ones hosted on a computer network. To do so, the RSPP spans the breadth of the information cycle, including information collection, organization, enrichment, and presentation, including sharing to one or more users.

[0067] The RSPP is composed of other processes including but not limited to the Resource Set Navigation Process (Navigation Process), the Resource Set Visual Designation Process (Visual Designation Process), and the Resource Set Array Responsive Action Process (Array Responsive Action Process). A description of the Navigation Process, Visual Designation Process, Array Generation Process, and Array Responsive Action Process and how they relate to each other follows below.

[0068] Using the RSPP, a user can interact with the computer device to construct a presentation, including one composed of hosted digital information resources, useful for a number of pursuits including education, business, travel, and other fields. Using the example of a presentation composed of hosted digital information resources, a professor can quickly construct a presentation composed of a chapter from an eTextbook, a scholarly article, Google Map views centered on the place of study, a worksheet from ExcelOnline, and other resources available to the professor and her students; a financial analyst can quickly construct a presentation composed of a Google Doc containing an investment thesis, bank reports,

Google Map views displaying areas relevant to an investment, a workbook from ExcelOnline, a stock chart from Yahoo Finance, and other resources available to the analyst and her associates; a travel agent or independent traveler can quickly construct a presentation composed of the traveler's daily itineraries, Google Map views showing tour routes, background information on tourist destinations, emergency contact information, and any other resources available to the travel agent, her clients, and/or the independent traveler. As implied above, each presentation may be composed of hosted digital information resources of unique origin.

[0069] The RSPP may utilize a Resource Set composed of a discrete set of one or more Resources, each of which may be composed of one or more Resource Pages and/or Resource Page Selections and/or the one or more Resource Pages' and/or Resource Page Selections' associated Resource Data. A Resource Page may be a webpage or other displayed digital information resource. A Resource Page Selection may be a specific view, state or collection of one or more elements of a Resource Page; a Resource Page Selection may be a Resource Page in its entirety. For the sake of clarity and readability a Resource Page may refer to both a Resource Page or Resource Page Selection in multiple instances throughout this disclosure. Resource Data is data that may include a Resource's organizational, informational, and/or locational attributes that is accessible, readable, and retrievable for use in the RSPP. Resource Data may include one or more of the following: each Resource's title; each Resource's Resource Page's network location (URI) or Resource Pages' network locations (URIs); one or more attributes defining a Resource Page Selection; one or more Resource Sets, Groups, or Sub-Groups with which each Resource is associated; each Resource's display order within one or more Resource Sets; each Resource's Visual Designator; each Resource's displays of one or more of the Resource's URIs including displays of one or more URIs within DOM element pop-ups; each Resource's other informational context that includes tags, text files, audio files, instructions indicating which sections of a Resource Page to emphasize, and links to other Resources.

[0070] To enable navigation from one presentation resource to a next presentation resource the RSPP may utilize the Navigation Process. The Navigation Process enables the repetitive selection of the same Navigation Specific UI Element in the Dynamic Navigation User Interface (DNUI) to result in the display of Resources in a Resource Set according to the Resource Set's creator's intended scope and sequence. A Navigation Specific UI Element refers to a UI element that may include directional arrows or buttons indicating concepts of sequence that are displayed in order to provide the means with which a next (next or previous

of an ordered set) Resource in the Resource Set can be accessed according to the Resource Set's creator's intended scope and sequence. The DNUI is a user interface that makes certain functions, including some or all of the following, available to the user: 1) repetitive selection of the same Navigation Specific UI Element in the DNUI to result in the display of one or more Resources in a Resource Set according to the Resource Set's creator's intended scope and sequence; 2) the display of Resource Data specific to each Resource in a Resource Set; 3) the means to access any Resource Data within any Resource Data Set; 4) the means to edit any Resource Data within any Resource Data Set; and 5) the means to share any Resource Data Set with any number of computing devices and servers on a computer network. The Resource Set Navigation Process and variations thereof are described in detail below.

[0071] Another aspect of the RSPP is the ability to organize Resources of a Resource Set in multiple ways and convey how each Resource has been organized (i.e. each Resource's organizational context) to the audience viewing and/or using the presentation. A Resource's organizational context may help provide information about each Resource that may not be intrinsic to or conveyed by the Resource's underlying Resource Page and/or Resource Page Selection viewed or considered in isolation. The RSPP provides multiple processes by which Resources of a Resource Set and the organizational context of each can be organized, displayed and conveyed.

[0072] Resources can be organized in one or more Groups within and generated from one or more Group Sets, regardless of each Resource's underlying format, application, origin, source, or other objective attribute. A Group Set contains and from it users can generate Groups. Groups can be defined by attributes different than and independent of those used to define those Groups contained in and/or that have been generated within other Group Sets. For example, a user may utilize both a Group Set named Queue and a Group Set named Subjects. Queue may be the Group Set with which a user may associate Resources that the user will organize in additional ways at a later time. Subjects may be the Group Set from which a user generates more specific Groups. One or more Resources may be associated with each Group in multiple ways including by associating the unifying attribute defining the Group with each Resource intended for organization as part the Group. For example, each Group, and thus its unifying attribute, could correspond with a specific pursuit such as education, business, and travel. In such a case, a user might choose to create Groups from the Subject Group Set such as Education, News, Finance, or Travel.

[0073] In addition, Sub-Groups may be created within each Group. Sub-Groups include both a Sub-Group derived from a Group as well as a Sub-Group derived from another Sub-Group.

The latter is for the sake of clarity and readability. In many instances, Sub-Group may refer to a Sub-Group derived from a Sub-Group derived from another Sub-Group, and so on. The number of possible divisions is limited only by the number of Resources in the Group or Sub-Group from which additional Sub-Groups can be derived. A Sub-Group can be created and defined in multiple ways including by associating one or more Resources with an attribute other than the unifying attribute or attributes defining the Sub-Group's parent Group or Sub-Group. Using an "Education" use case narrowed to one in which a presentation is composed of hosted digital information resources as an example, a user may want to associate one or more Resources associated with the Education Group with an additional attribute such as Ancient Rome. A user may want to associate one or more of the same or other Resources associated with the Education Group with an additional attribute such as Chemistry. By associating one or more Resources within the Education Group with the Ancient Rome and Chemistry attributes the user can create the Sub-Groups of Ancient Rome and Chemistry, respectively. As shown throughout this disclosure, a Group may be refined to its constituent Sub-Groups by applying one or more attributes as tags, each associated with the Sub-Group and serving as its unifying attribute, to the parent Group. Similarly, for the Finance Group a user might create Sub-Groups such as Forecasts, Valuations, Research, etc. For the Travel Group a user might create Sub-Groups based on a destination attribute such as World Cup 2016, National Park Tour, Caribbean Cruise, etc.

[0074] The Resources associated with any Resource Set (Group, Sub-Group, or other) may vary considerably in subjective attributes including the functional role or roles (main idea, context, instruction, etc.) each plays with respect to the entirety of a presentation of which the Resources are a part.

[0075] For example, and continuing with the "Education" example above, some Resources associated with the Sub-Group Ancient Rome of the Group Education, might be more important to a presentation of which they are a part than others because they express one or more of the presentation's main ideas. Other Resources associated with the Sub-Group Ancient Rome of the Group Education, might be less important to the presentation than others because they express the information supplementary to that expressed by those Resources expressing the presentation's main idea(s). Still other Resources might provide instruction for one or more of a presentation's constituent Resources, Sub-Groups, or Groups.

[0076] The Resources associated with any Resource Set (Group, Sub-Group, or other) also may vary considerably in other subjective attributes (including content) or more objective

attributes (including source, format, and date of information) with respect to the entirety of a presentation of which the Resources are a part.

[0077] For an alternative example, each of one or more Resources associated with a Sub-Group "Knowlio, Inc. - Filing" of the Group Patents might be a textual description of the "Knowlio, Inc. - Filing". Each of other Resources associated with the Sub-Group "Knowlio, Inc. – Filing" of the Group Patents might be a Figure associated with a specific textual description.

[0078] Because the Resources of a Resources Set may fulfill different roles with respect to, or be associated with distinct subjective or objective attributes relevant to a presentation as a whole, it may be valuable to simultaneously isolate and display Resources of a Resource Set according to each Resource's role or other attributes in the presentation, and, potentially, association with other Resources of the Resource Set.

[0079] As such, and continuing with the "Education" example above, a presentation creator might determine that two Resources within the Sub-Group Ancient Rome of the Group Education express the main ideas of the presentation and eight other Resources within the Sub-Group Ancient Rome of the Group Education express information supplementary to that expressed by those Resources expressing the presentation's main ideas. To this end, the user could associate the two Resources expressing the presentation's main ideas with a Visual Designator called Focus and associate the eight Resources expressing the information supplementary to the main ideas with a Visual Designator called Context. Generally, a Visual Designator may be a data element including one or more words, numbers, images, symbols, or other information that may be associated with both 1) a digital information resource and/or viewing component displaying a digital information resource and 2) a defined area of a display, including a Pane (defined in greater detail below).

[0080] To that end, in the "Education" example, the user also could associate the left half of the Client Area of the user's Display Device, defined as an area Pane L, with the Visual Designator Focus and associate the right half of the Client Area of the user's Display Device, defined as an area Pane R, with the Visual Designator Context. For presentations composed of hosted digital information resources, a Pane also may be defined as an area within the display space of a Browser Window. As such the left half of a single Browser Window could be defined as Pane L and the right half of a single Browser Window could be defined as Pane R. However, for the sake of clarity and readability the "Education" example follows an implementation in which a Pane defines an area of the Client Area of the user's Display Device. In this way the user may convey which Resources are most important and which

Resources are supplementary by the position each Resource is assigned for display on the Display Device. The latter is a specific example of a more general function of another aspect of the RSPP, the Visual Designation Process. The Visual Designation Process allows meaning to be conveyed about a Resource based on the position the Resource is assigned on the Display Device.

[0081] Once a Visual Designation Process has taken place, another aspect of the RSPP, the Array Generation Process, may be used to generate a visual Array of one or more Resources of a Resource Set, each Resource of the Array being positioned over a defined area of a Display Device, the Resource and/or its viewing component and defined area of the Display Device having been associated with one or more common Visual Designators.

[0082] Continuing with the "Education" example above, initially, a user may initiate an Array Generation Process such that the Browser Window assigned to display a Resource associated with the Visual Designator Focus may be sized and positioned to display over the Pane L, defining the left half of the Client Area of the user's Display Device, and the Browser Window designated to display Resources associated with the Visual Designator Context may be sized and positioned to display over the Pane R, defining the right half of the Client Area of the user's Display Device. Viewing a presentation's information in this way is valuable for many reasons including 1) conveying information, including non-intrinsic information, about a Resource or Resource Set by virtue of its position on the Display Device, and 2) providing visual continuity by the simultaneous display of one or more Resources of a Resource Set. For example, and continuing with the "Education" example above, a Resource of the Sub-Group Ancient Rome of the Group Education designated as a Focus, may be positioned and sized to display over the Pane L, defining the left half of the Client Area of the user's Display Device. By virtue of this placement a user of the presentation could know that this Focus Resource conveys a main idea of the presentation and, perhaps, that he or she should focus more of the user's attention on that Resource. In a similar way, a Resource of the Sub-Group Ancient Rome of the Group Education designated as a Context, may be positioned and sized to display over the Pane R, defining the right half of the Client Area of the user's Display Device. By virtue of this placement, a user of the presentation can know that this Context Resource conveys information supplementary to that of the Focus or Focuses of the presentation and, perhaps, that he or she should develop his or her understanding of its content by concentrating on how it relates to the Focus(es). At the same time, both the Focus Resource and Context Resource are made more valuable by the simultaneous display of the other; the simultaneous display of Resources reduces visual

discontinuity and, thus, the cognitive burden a user experiences by viewing related Resources successively in isolation. For example, and continuing with the "Education" example above, the Focus might be a chapter from an eTextbook on Roman engineering. The Context might be a series of Google Map Street Views of one or more examples of Roman engineering, perhaps, an aqueduct and/or a building such as the Colosseum. The Focus might contain valuable text about Roman engineering and possibly a limited depiction of the same example of Roman engineering provided in the Context. However, the Context can provide additional insight and granularity regarding the text and limited example provided in the Focus and thus supplement the information conveyed in the Focus. Conversely, the Focus could provide additional insight and granularity into the example displayed in the Context. Being able to view both simultaneously minimizes the cognitive burden associated with the context switching a user would experience if the Focus and Context only could be viewed easily in successive isolated displays. As implied, the example above is non-limiting and it should be understood that the Array Generation Process may be used to generate Arrays in a number of configurations and by a number of similar methods.

[0083] Once an Array has been generated, another aspect of the RSPP, the Array Responsive Action Process, may used so that an event affecting the display of elements of one or more Resource may affect the display of elements of one or more other Resources of an Array. Continuing with the "Education" example above, after viewing an Array of Sub-Group Ancient Rome of the Group Education, a user may want to transition to another Group or Sub-Group. For example, a user may want to view the Resources of the Group Travel and view the Resources of the Group Travel in Array form. By selecting Travel from a list of available Groups in an Application UI of the Focus Resource of Sub-Group Ancient Rome of the Group Education in the Focus Browser Window, a user can expect and affect a transition from not just the Resource of Sub-Group Ancient Rome of the Group Education in the Focus Browser Window to a Focus Resource of the Group Travel in the Focus Browser Window but also from the Resource of Sub-Group Ancient Rome of the Group Education in the Context Browser Window to a Context Resource of the Group Travel in the Context Browser Window. In another instance, a user may want to navigate from one Focus Resource to another Focus Resource within the same Group or Sub-Group. In many instances, Resources associated with one or more Visual Designations may be associated with specific Resources also associated with one or more Visual Designations. For example, multiple Context Resources may be associated specifically with a single Focus Resource. Multiple other Context Resources may be associated with a different, single Focus Resource. For example,

and continuing with the "Education" example above, one Focus Resource might be a chapter from an eTextbook on Roman engineering with multiple Context Resources in the form of Google Map Street Views, scholarly articles, hosted images, etc., each providing supplementary information about the eTextbook chapter in Focus. Another Focus Resource might be an educational video on the Roman Forum with multiple Context Resources in the form of Google Map Street Views, scholarly articles, hosted images, etc., each providing supplementary information about the video in Focus. When the user chooses to navigate from the eTextbook chapter to the educational video (e.g. from one Focus to the next), the user can and should expect the Context Resource in the Context Browser Window to navigate from that associated with the eTextbook to that associated with the educational video.

[0084] More generally, when utilizing Array Resources displayed in one or more Browser Windows, an Array Responsive Action Process may enable an event affecting the display of an Array Resource and/or its Rendered View (an object representing the contents of a webpage displayed in a Tab) and/or its Tab and/or its Browser Window to affect the display of one or more other Array Resources and/or their Rendered Views and/or their Tabs and/or their Browser Windows. The Array Resource affecting the one or more other Array Resources may be simultaneously displayed in the same Browser Window and/or Tab as one or more of the one or more other Array Resources. A process such as the Array Responsive Action Process may be said to make Resources of an Array "responsive" to each other.

[0085] FIGs. **38 - 40** provide a graphic overview of the "Education" example. These figures are illustrative of the examples above provide examples of user interfaces that may be displayed at different stages during execution of the processes described herein. The description below provides additional details of the Navigation Process, Visual Designation Process, Array Generation Process, Array Responsive Action Process, and the relation of each to the others.

[0086] FIG. **1** is a block diagram of a system **1000** for performing several of the Resource Set Presentation Processes including the Navigation Process, the Visual Designation Process, the Array Generation Process, and the Array Responsive Action Process. In the example of FIG. **1**, a Local Computing Device **1002** is illustrated as communicating with multiple remote servers, one or more Remote Resource Page Servers **1004** and a Remote Application Data Server **1006**, in The Cloud **1008** in order to provide, using a Display Device **1010**, one or more Browser Windows **1012** with Tabs **1014** each of which may display 1) a Resource Page **1016** at a URI **1018**, the Resource Page **1016** being stored at a Remote Resource Page Server **1004** (each independently hosted Resource Page **1016** may have its own Remote Resource

Page Server **1004**); and/or 2) an Application User Interface (AUI) (e.g., a Browser-bound AUI **1020**, a Page-bound AUI **1022**, or a Page-bound AUI **1024**) that may include Resource Data of a Resource Data Set **1026** and Other Data of Other Data Sets **1028** that may be stored at the Remote Application Data Server **1006** and other elements which are stored in various system components at different times in the Resource Set Presentation Process (RSPP). FIG. **1** shows two examples of how an AUI could be rendered in a Tab **1014** of a Browser Window **1012** and displayed in the Client Area **1030** of the Display Device **1010**. An AUI also may be rendered in a separate pop-up window not specifically illustrated in the example of system **1000**.

[0087] The components represented in FIG. **1** may be modified to simultaneously display multiple Resources in the display area of a single browser window. System **1001** of FIG. **2** shows an example of such a configuration. In the example of FIG. **2**, a Local Computing Device **1002** is illustrated as communicating with multiple remote servers, one or more Remote Resource Page Servers **1004** and a Remote Application Data Server **1006**, in The Cloud **1008** in order to provide, using a Display Device **1010**, a Browser Window **1013** with a Tab $\mathbf{1015}_i$ and multiple Rendered Views $\mathbf{1017}_1$ and $\mathbf{1017}_i$ each of which may simultaneously display 1) a Resource Page $\mathbf{1016}_1$ and $\mathbf{1016}_i$, of the URIs $\mathbf{1018}_1$ and $\mathbf{1018}_i$, the Resource Pages $\mathbf{1016}_1$ and $\mathbf{1016}_i$ being stored at Remote Resource Page Servers $\mathbf{1004}_1$ and $\mathbf{1004}_i$ (each independently hosted Resource Page **1016** may have its own Remote Resource Page Server **1004**); and/or 2) an Application UI (AUI) (e.g., a Browser-bound AUI **1021**, a Page-bound AUI **1023**, or a Page-bound AUI **1025**) that may include Resource Data of a Resource Data Set **1026** and Other Data of Other Data Sets **1028** that may be stored at the Remote Application Data Server **1006** and other elements which are stored in various system components at different times in the Resource Set Presentation Process (RSPP). FIG. **2** shows two examples of how an AUI could be rendered in a Rendered View **1017** of Tab **1015** of a Browser Window **1013** and displayed in the Canvas Area **1031** (generally, the Canvas Area may be the portion of a Browser Window that may be used to display one or more Resources, Resource Pages, and/or webpages) of the Display Device **1010**. An AUI also may be rendered in a separate pop-up window not specifically illustrated in the example of system **1001**.

[0088] In the description of FIGs. **1** and **2** that follows many components are numbered using numerical references to both FIG. **1** and **2**. In each case, the dual numerical reference is used to consolidate descriptive language that may apply to the component configured for both system **1000** and **1001**. For example, "Browser Window" may be followed by the numerical

reference **1012/1013** to indicate that the associated descriptive language applies to both the Browser Window of system **1000** and **1001**, respectively.

[0089] Continuing on, the components desirable for an example implementation of the Browser-bound AUI **1020/1021** shown in FIGs. **1** and **2** are illustrated and discussed in detail in FIGs. **22**, **23**, **24**, and **25**. The components desirable for example implementations of the Page-bound AUI **1022** shown in FIG. **1** are illustrated and discussed in detail in FIGs. **26**, and **27**. The components desirable for example implementations of the Page-bound AUI **1024** shown in FIG. **1** are illustrated and discussed in detail in FIGs. **28**, and **29**. FIGs. **22**, **23**, **24**, **25**, **26**, **27**, **28**, and **29** are provided for the sake of clarity and serve only as examples of the components desirable to render the Browser-bound AUI and Page-bound AUI and how each may be utilized in the Navigation Process, Array Generation Process, and Array Responsive Action Process; the same components may be utilized in the Visual Designation Process as well.

[0090] With slight modification, those components represented in FIGs. **22**, **23**, **24**, and **25** could render a Page-bound AUI instead of a Browser-bound AUI for use in the Navigation Process, Array Generation Process, Visual Designation Process, and Array Responsive Action Process. Also with slight modification, those components represented in FIGs. **26**, **27**, **28**, and **29** could render a Browser-bound AUI instead of a Page-bound AUI for use in the Navigation Process, Array Generation Process, Visual Designation Process, and Array Responsive Action Process.

[0091] In the figures and descriptions herein, many system components may exist in multiple instances fulfilling the same function in each instance. In many cases, in order to clarify when there are or could be multiple instances of the same system component represented in a figure or being described in the text that fulfill the same function, the label number of each instance of the component will be annotated with a subscript indicating its distinction from other instances of the same component. The subscript "i" will be used to represent one or more instances of a component in addition to other instances of the same component described and labeled with an integer subscript such as "1" or "2". For example, and as shown in FIG. **1** of system **1000**, multiple Browser Windows are represented by "Browser Window **1012_1**" and "Browser Window **1012_i**"; the former, a first, single instance of a Browser Window; the latter, a representation of one or more Browser Windows, the number of which being dependent on system constraints and inputs. In other cases, a component shown in a figure with a subscript such as "i" or "1" may be referred to without the subscript, indicating the component is being referenced in more general terms. For example, in FIG. **1** Browser

Window is shown as "Browser Window **1012**$_1$" and "Browser Window **1012**$_i$". However, in the associated description of FIG. 1 and in many instances throughout this disclosure, Browser Window is also referenced as **1012**.

[0092] A Local Computing Device **1002** may generally represent a computing device that may be configured to execute an otherwise conventional Browser Application **1032**, and to communicate over a network with the Remote Resource Page Server **1004** and the Remote Application Data Server **1006**. For example, the Local Computing Device **1002** may represent any standard desktop or personal computing device, such as any laptop, notebook, netbook computer, any tablet computer, any Smartphone or other mobile computing device, or any virtual reality headset. Such computing devices, and other computing devices, may be configured to access each Remote Resource Page Server **1004** and Remote Application Data Server **1006** over one or more computer networks, in any conventional manner. For example, many Local Computing Devices may include various types of network-related hardware/software which enable the Local Computing Device **1002** to communicate over the public internet, private intranet, or other network, with each Remote Resource Page Server **1004** and Remote Application Data Server **1006**. The Display Device **1010** may represent one or more of a conventional type of display such as a monitor, touch-screen, virtual reality, or other type of visual or auditory display. In many cases, a single Local Computing Device **1002** may be associated with multiple displays. For the sake of readability, Display Device **1010** may refer to either a single display device and/or multiple display devices. The Client Area **1030** represents the portion of the Display Device **1010** that may be used to display one or more Browser Windows. An Array may or may not be sized and positioned to fill the entire area as shown in this figure.

[0093] In the description below, it is generally assumed that the Local Computing Device **1002** and the Browser Application **1032/1033** communicate with each Remote Resource Page Server **1004** and Remote Application Data Server **1006** over the public internet, and therefore use standard and conventional protocols for identifying, retrieving, and rendering each Resource Page **1016** and Data, including Resource Data of the Resource Data Set **1026**, e.g., from a web server represented by Remote Resource Page Server **1004** and from a Remote Application Data Server **1006**. However, it will be appreciated that such examples are provided merely for the sake of clarity and conciseness, and are not intended to be limiting of the different ways in which the Local Computing Device **1002** may identify, retrieve, render, or display Resource Pages and Data, including Resource Data, in association with the Browser Application **1032/1033**, Browser Window **1012/1013**, and Tab **1014/1015**.

[0094] In this description, it may generally be assumed that each Resource Page **1016** represents any of the many types of hosted information resources in the form of webpages that are available over the public internet. For example, a Resource Page **1016** may represent a substantially static page that includes text, sound, images, or other content which may be displayed within a Browser Window **1012/1013**. In other examples, a Resource Page **1016** may include different types of dynamic or interactive content that can be engaged and manipulated by the user within the context of a Browser Window **1012/1013**. In many instances, Resource Page **1016** and/or associated executable code may represent an application which may execute partially or completely at a Remote Resource Page Server **1004** (e.g., may utilize the processor, memory, and other hardware/software resources of the Remote Resource Page Server **1004**), while providing associated functionality and features to the user via Browser Window **1012** (and perhaps executing at least partially locally at the Local Computing Device **1002**). As just referenced, such hosted information resources in the form of webpages and associated functionalities and applications are well-known to be implementable using various, conventional programming languages and techniques including hypertext markup language (HTML), Asynchronous JavaScript (AJAX), Extensible Markup Language (XML), JavaScript, JavaScript Object Notation (JSON), and many other types of code which may be executed.

[0095] In FIGs. **1** and **2**, a Resource Page **1016** at a Remote Resource Page Server **1004** is illustrated as including, or being associated with, a Page Model **1034** and a Page Script **1036**. The use of such a Page Model **1034** and Page Script **1036** is known to and would be readily apparent to one of skill in the art and as such is not described in detail herein.

[0096] During a conventional rendering of a Resource Page **1016** by the Browser Application **1032/1033**, a Temporary Memory **1038a**, (e.g., a cache memory) at the Local Computing Device **1002** may be used to store temporarily the Page Model **1034** and the Page Script **1036**. This, however, is meant to provide an example, and it may be appreciated that the Browser Application **1032/1033** may partially or completely access the Page Model **1034** and/or the Page Script **1036** remotely at the Remote Resource Page Server **1004**. In this way, the Browser Application **1032/1033** may utilize the Page Model **1034** and the Page Script **1036**, e.g., in a conventional manner, so as to thereby render a Resource Page **1016** within the Browser Window **1012/1013** provided by the Browser Application **1032/1033**.

[0097] Similarly, and as implied by system **1000/1001**, Application Data, including a Resource Data Set, may be downloaded from its Remote Application Data Server **1006** to the Local Computing Device **1002** and stored in Temporary Memory **1038b** for use by the

Application Controller **1040/1041** (generally, an application controller may represent a set of handlers (message or event handlers) and/or the application's associated business logic and other data elements). However, it may be appreciated that there are other possible ways with which Application Data, including Resource Data, can be made accessible to the Application Controller **1040/1041**. For example, Resource Data can be created and stored locally and then shifted to temporary memory for use by the Application Controller **1040/1041**. Also, locally stored Resource Data can be combined with the Resource Data Set **1026** initially stored at Remote Application Data Server **1006**; this combination can then be stored in temporary memory as a larger Resource Data Set for use by the Application Controller **1040/1041**.

[0098] The Application Controller **1040/1041**, in coordination with the Application UI Controller **1042/1043** (described in detail below) and Other Files **1044/1045**, provides that each Resource Page and/or Resource Page Selection is rendered alongside its specific Resource Data as a Resource displayed in a Browser Window **1012/1013**; thus, the Application Controller **1040/1041** may be thought of as what links the files on each Remote Resource Page Server **1004** with the Resource Data files on Remote Application Data Server **1006**. The Application Controller **1040/1041** in coordination with the Application UI Controller **1042/1043** and Other Files **1044/1045** also provides the basis for combining the ordinary/traditional functions of a Browser Application and Display Device to create visual and functional relationships between Resources; thus, the Application Controller **1040/1041** also may be thought of as what links one independent Resource to another.

[0099] As configured in system **1000/1001**, the Application Controller **1040/1041** may contain or directly access several sub-components, functions, and data structures central to the functions of the RSPP including one or more Array Management Complexes (AMC)s, each governing a separate Array Type and its behavior. An AMC itself may contain or directly access several sub-components, functions, and data structures central to the Visual Designation Process, Array Generation Process, and Array Responsive Action Process. FIGs. **3**, **4**, **5**, **6**, **7**, **8**, **9**, **10**, **11**, **12-16**, and **17-21** provide visual representations of several of these sub-components, functions, and data structures to help clarify their role in the RSPP as described herein.

[0100] As implied above, an AUI Controller's **1042/1043** functions often fall between an AUI and the Application Controller **1040/1041**. These functions may include the following: 1) convey AUI inputs to Application Controller **1040/1041** which the Application Controller can interpret to build the Application UI View State and Resource Data Message corresponding to the inputs to the AUI; 2) inform the Application Controller **1040/1041** it is

ready to receive the Application UI View State and Resource Data Message; 3) receive the Application UI View State and Resource Data Message; and 4) interpret and execute the tasks of the Application UI View State and Resource Data Message, ultimately resulting in the display of one or more AUIs in one or more Browser Windows **1012/1013**. An Application UI View State and Resource Data Message may be one or more messages containing an Application UI View State (generally, an Application UI View State is executable code defining and containing the elements useful for the display and function of an AUI), Resource Data, and/or instructions useful for execution and display of a specific AUI by the AUI Controller. The Application UI View State and Resource Data Message may come in several forms including the Dynamic Navigation UI View State and Resource Data Message. A Dynamic Navigation UI View State and Resource Data Message may be one or more messages containing the Dynamic Navigation UI View State (generally, executable code defining and containing the elements useful for the display and function of a DNUI), Resource Data, and/or instructions useful for execution and display of a Resource specific DNUI by the AUI Controller. The Dynamic Navigation UI View State and Resource Data Message is an example of an Application UI View State and Resource Data Message. How it can be used is described in detail below. The Dynamic Navigation UI View State and Resource Data Message is central to multiple implementations of the Navigation Process, variants of the Array Responsive Action Process, and may be used in the Array Generation Process as well. How it can be used is described in detail below.

[0101] The AUI Controller **1042/1043** may represent more than one AUI Controller. For example, for the descriptions and figures of system **1000** AUI Controller **1042** may represent multiple AUI Controllers including an AUI Controller for each Tab of an Array. Likewise, for the descriptions and figures of system **1001** AUI Controller **1043** may represent multiple AUI Controllers including an AUI Controller for each Rendered View of an Array.

[0102] A shared Configuration File **1046/1047** and Other Files **1044/1045** are useful to support many implementations of the Navigation Process, Visual Designation Process, Array Generation Process, and Array Responsive Action Process. Other Files **1044/1045** may include the following file types: HTML files, JSON files, cascading style sheets (CSS) files, JavaScript files, image files, audio files, and text files.

[0103] As implied by system **1000/1001**, the Application Controller **1040/1041**, the AUI Controller **1042/1043,** and Other Files **1044/1045** provide functionality to the Browser Application **1032/1033**. The Application Controller **1040/1041**, AUI Controller **1042/1043**, and Other Files **1044/1045** can do so either by being directly incorporated into the Browser

Application **1032/1033** or by being made available for use by the Browser Application as a set of files that provide additional features or functionalities in association with the Browser Application. In system **1000/1001**, these files are shown as the Extension Files **1048/1049** but may, as may be understood from the more detailed description below, generally refer to browser extensions, add-ons, active X controls, web applications (web apps, apps) or any other program code which is designed to augment an appearance or functionality of the Browser Application **1032/1033** in providing the Browser Window **1012/1013** and page and elements rendered within it. The Background Page **1050/1051**, Content Script File(s) **1052/1053,** and Other Files **1054/1055** are outlined with a dotted line and connected with dashed lines to the Application Controller **1040/1041**, AUI Controller **1042/1043**, and Other Files **1044/1045** respectively, to indicate that the Background Page **1050/1051**, Content Script File(s) **1052/1053,** and Other Files **1054/1055** provide functions similar to the functional components with which each is connected by the dashed lines in an alternative implementation of system **1000/1001**. That is, in the latter alternative arrangement and implementation, the Background Page **1050/1051** would fulfill one or more functions of the Application Controller **1040/1041**; Content Script File(s) **1052/1053** would fulfill one or more functions of the AUI Controller **1042/1043**; and the Other Files **1054/1055** would fulfill one or more functions of the Other Files **1044/1045**. The Manifest File **1056/1057** is outlined with a dotted line and connected with dashed lines to the Configuration File **1046/1047**, to indicate that the Manifest File **1056/1057** can provide an alternative arrangement to and implementation of part or all of Configuration File **1046/1047**. That is, in the latter alternative arrangement and implementation, some or all functions of the Configuration File **1046/1047** may be embodied in the Manifest File **1056/1057**.

[0104] As described herein, the Extension Files **1048/1049** may be utilized in the system **1000/1001** to provide additional features or functionalities in association with the Browser Application **1032/1033**, and thus with respect to the Browser Window **1012/1013**. In the example of system **1000/1001**, an Extension Icon **1058/1059** represents an icon that is provided in conjunction with the Browser Application **1032/1033**. The Extension Icon **1058/1059** may be produced by, or in conjunction with, the various Extension Files **1048/1049**.

[0105] A browser extension generated by the Extension Files **1048/1049** may generally refer to a browser extension, add-on, active X control, web applications (web app, app) or any other program code which is designed to augment an appearance or functionality of the Browser Application **1032/1033** in providing the Browser Window **1012/1013** and page and

elements rendered within it. As such, the Extension Files **1048/1049** may include one or more of various types of files, such as, for example, HTML files, JSON files, CSS files, JavaScript files, image files, audio files, text files, or other type of code or content that may be used to extend the features and functionalities provided by the Browser Application **1032/1033**.

[0106] Some or all of the Extension Files **1048/1049** may be understood to be virtually indistinguishable in appearance, structure, and function with respect to otherwise conventional webpages which might be rendered by the Browser Application **1032/1033**. Such files can use all the functionality of the Browser Application **1032/1033** with respect to the rendering of webpages. For example, those Extension Files **1048/1049** virtually indistinguishable in appearance, structure, and function with respect to otherwise conventional webpages may use the various application program interfaces (APIs) that the Browser Application **1032/1033** provides to external webpages such as Resource Page **1016**.

[0107] In additional examples of the Extension Files **1048/1049**, an associated extension may provide functionality to the Browser Application **1032/1033**, such as a browser action to be implemented by the Browser Application **1032/1033** when the extension in question is relevant to most or all pages to be rendered by the Browser Application **1032/1033** within the Browser Window **1012/1013**.

[0108] Thus, with respect to the simplified example of the system **1000/1001**, a browser action of the Extension Files **1048/1049** may cause the Extension Icon **1058/1059** to appear within the Browser Window **1012/1013** essentially independently of the Resource Page **1016**. Further, as is known, other extension functions may be implemented automatically in conjunction with an operation of the Browser Application **1032/1033**, e.g., in conjunction with the loading and rendering of the Resource Page **1016**. Further, as is known, other extension functions may be implemented programmatically. That is, for example, an extension may be configured to execute in a manner that is dependent upon a user's selection of a feature of the Browser Application **1032/1033**. An extension also may be configured so that can it can add multiple functions to the Browser Application **1032/1033** by utilizing one or more of the implementations described above. For example, an extension may be configured so that it executes one or more of these functions automatically and one or more of these functions programmatically. Such an example is described in the figures and text below.

[0109] In the simplified example of the system **1000/1001**, the Extension Files **1048/1049** are illustrated as being stored locally to the Local Computing Device **1002**. For example, a user of the Local Computing Device **1002** may program and store the Extension Files **1048/1049**

for use by the Browser Application **1032/1033**. In additional or alternative examples, however, it may be appreciated that some or all of the Extension Files **1048/1049** may be accessed remotely. For example, a particular extension may be packaged within a single folder or archive that may then be accessed by the Browser Application **1032/1033**. For example, a provider and/or distributor of the Extension Files **1048/1049** (not specifically illustrated in the example of system **1001/1001**) may construct and package the Extension Files **1048/1049**, and a user of the system **1000/1001** may thereby download and install a desired extension, including accessing, downloading, and installing the Extension Files **1048/1049** at the Local Computing Device **1002**, as shown.

[0110] As mentioned, the Extension Files **1048/1049** include various different types of files. For example, the Extension Files **1048/1049** may include a Manifest file **1056/1057** which contains information about the extension, such as, its most important files and capabilities and provides configuration information to the Browser Application **1032/1033** that will affect the behavior of the extension at runtime. In another example, as illustrated in the example system **1000/1001**, the Extension Files **1048/1049** may include a background file or background page, commonly an HTML page, which is generally known to represent an invisible page which holds the main logic of the extension, and which may thus run in the background so as to be always-available in case of some initiation of a relevant extension action. In system **1000/1001**, the Background Page **1050/1051** fulfills this function (and other functions) and by doing so, fulfills the role of Application Controller **1040/1041** when provided. For example, for an extension installed on the Local Computing Device **1002** that includes the Extension Files **1048/1049**, a browser action may be defined to have some affect on the rendering of the Resource Page **1016** via the Browser Window **1012/1013**. Thus, the Extension Icon **1058/1059** may represent or be associated with such a browser action, and the associated Background Page **1050/1051** may be defined by an HTML file which has JavaScript code that controls a behavior of the browser action associated with the Extension Icon **1058/1059**.

[0111] It may be appreciated that the Extension Files **1048/1049** may include various other types of files as well. For example, the Extension Files **1048/1049** may include other types of HTML pages, such as, for example, an HTML page associated with the browser action providing a pop-up window in association with the Browser Window **1012/1013**. These may work in coordination with an AUI to provide some of the functions of the Extension Files **1048/1049**. Thus, as described, HTML pages and associated code within the Extension Files **1048/1049** may include a background page associated with the Background Page **1050/1051**,

as well as a pop-up page associated with a corresponding pop-up file (not specifically illustrated in the example of system **1000/1001**).

[0112] As illustrated in the example of system **1000/1001**, and as referenced above, the Extension Files **1048/1049** may include, or be associated with Content Script File(s) **1052/1053** which would provide functions of the AUI Controllers **1042/1043**. As is known, the Content Script File(s) **1052/1053** may represent, or include, one or more content scripts that enable an associated extension to interact with webpages, e.g., the Resource Page **1016**. For example, the content script or content scripts of the Content Script File(s) **1052/1053** may be implemented as JavaScript that executes in the context of a Resource Page **1016** as loaded into the Browser Application **1032/1033**. Therefore, the content script or content scripts of the Content Script File(s) **1052/1053** may be considered effectually part of a loaded page, instead of being considered part of an extension with which the content script or content scripts of the Content Script File(s) **1052/1053** was packaged.

[0113] Content scripts, generally speaking, may be configured to read details of webpages visited by the Browser Application **1032/1033**, and may be further configured to make changes to such pages. For example, a content script may be configured to read and/or modify the Page Model (e.g., DOM) **1034** of a Resource Page **1036.** The specific process for this is known.

[0114] As described in detail herein, the content script or content scripts of the Content Script File(s) **1052/1053** may be enabled to communicate with the Background Page **1050** of the relevant Extension Files **1048/1049** or with other files/pages associated with the Extension Files **1048/1049**. For example, as described in detail or implied below with respect to FIGs. **26**, **27**, **28**, and **29** the content script or content scripts of the Content Script File(s) **1052** may be enabled to exchange messages with an associated Background Page **1050**. For example, the content script or content scripts of the Content Script File(s) **1052/1053** might send such messages to the associated Background Page **1050/1051** in response to some detected event. Additionally, the associated Background Page **1050/1051** may be enabled to send a message to the content script or content scripts of the Content Script File(s) **1052/1053** to request the content script or content scripts to change the appearance of the relevant browser page, (e.g., the Resource Page **1016**) in a desired manner. FIGs. **26**, **27**, **28**, and **29** describe in detail the message exchange between the content script or content scripts of the Content Script File(s) **1052** and the associated Background Page **1050** and how it is used to result in the display of an AUI, including a Dynamic Navigation UI.

[0115] In more specific examples, the content script or content scripts of the Content Script File(s) **1052/1053** may include JavaScript files running in a context of a Resource Page **1016** being rendered. In some example implementations, such as those in FIGs. **26**, **27**, **28**, and **29** the content script or content scripts of the Content Script File(s) **1052** should always, or by default, be injected into a Resource Page **1016** to be loaded. For example, such content script or content scripts of the Content Script File(s) **1052/1053** may be registered in the Manifest File **1056/1057** of Extension Files **1048/1049** with the corresponding extension. Further, it may be appreciated that a given extension may be configured to insert multiple content scripts into a Resource Page **1016** during the rendering thereof, where each such content script may have multiple JavaScripts, or other types of content script content.

[0116] In the example of system **1000/1001**, the Local Computer Device **1002** is illustrated as including at least one processor **1060**, as well as a non-transitory Computer Readable Storage Medium **1062**. That is, for example, the Local Computing Device **1002** may rely on two or more processors executing in parallel to achieve a desired result. Meanwhile, the non-transitory Computer Readable Storage Medium **1062** may represent any conventional type of computer memory which may be used, for example, to store instructions which, when executed by the at least one processor **1060**, cause the Browser Application **1032/1033** and/or other components of the Local Computing Device **1002** and the Display Device **1010** to perform various functions, including other relevant functions described herein and the processes described below..

[0117] The Servers **1004**, **1006** may similarly comprise at least one processor and a non-transitory computer readable storage medium that stores instructions that when executed by the at least one processor causes the at least one processor to perform the functions attributed to the respective Servers **1004**, **1006** described herein.

[0118] In the example of FIGs. **1**, **2**, **22**, **23** **24**, **25**, **26**, **27**, **28**, and **29** elements and components are illustrated including discrete functional modules. However, it may be appreciated that such illustration is merely for the sake of example, and that other implementations are possible. For example, a single element or component of the Browser Application **1032/1033** may be implemented by two or more elements or and components. Conversely, two or more components of the Browser Application **1032/1033** may be executed using a single component. The Application Controller **1040/1041** and its embodiment in a Background Page may access these components and may contain or directly access several sub-components, functions, and data structures not explicitly shown in system **1000/1001**. FIGs. **3**, **4**, **5**, **6**, **7**, **8**, **9**, **10**, **11**, **12-16**, and **17-21** provide non-limiting visual

representations of several of these components, sub-components, functions, and data structures to help clarify their role in RSPP processes utilizing web-based Resources. However, it should be noted that similar components, functions, and data structures may be utilized by the RSPP to execute processes with an application acting at a lower, operational system level that may distinguish between and utilize Resources, including non-web-based Resources (e.g. a word processing document, PDF document, spreadsheet, image, etc.), of multiple applications on Local Computing Device **1002.**

[0119] It is also important to note that the RSPP may generate, manage and govern behavior for an Array composed of any number of viewing components including, Browser Windows, Tabs, or Rendered Views, and their associated Resources. In addition, the RSPP may generate, manage and govern behavior for multiple Arrays. Furthermore, the RSPP may generate, manage and govern behavior for multiple Arrays for multiple Array Types. This implies that system **1000/1001** may be composed of "i" instances of its components, sub-components, functions, and data structures in addition to a first, "1", instance of each.

[0120] For the sake of clarity, FIGs. **3**, **6**, **8**, **12-16**, **22**, **23**, **26**, **27**, **28**, and **29** will represent and follow a "General" example, the focus of which will be an example set of components, sub-components, functions, and data structures and elements of a system **1000** that may be used to generate, manage and govern behavior for an Array Type of two Array Browser Windows (generally, an Array Browser Window is a browser window displayed as part of an Array and/or recognized by an AMC as a Browser Window of one or more of its Arrays), Array Tabs (a tab displayed as part of an Array and/or recognized by an AMC as a Tab of one or more of its Arrays) and a single Array Resource (generally, an Array Resource is a Resource displayed in an Array) displayed in each. The "General" example is similar to but describes RSPP processes in more general terms than the "Education" example. Central to the "General" example is the AMC XY. However, AMC XY and its Array Type provide only a focal point to help illustrate a single instance of a range of useful outcomes the RSPP creates. The "General" example in no way implies the RSPP and may generate, manage and govern behavior for only a single, two Browser Window Array Type. As shown above and herein, several of the figures and descriptions explicitly represent and discuss the existence of one or more Arrays and Array Types. Still, focusing on how the AMC XY interacts with the other components, sub-components, functions, and data structures throughout the "General" example of system **1000** is useful because it may be used as a model for how one may generate, manage and govern behavior for any number of other Array Types implemented in a range of systems.

[0121] FIG. **3** is intended to help clarify several of the concepts and processes described in this disclosure by providing a visual representation that focuses on a "General" example of many of an Array Management Complex's (AMC)'s functional components described herein, specifically those of an AMC XY **1064**. This figure does not represent the exact form in which this AMC or data referenced within will exist within either the Application Controller **1040** or the Resource Data Set **1026** and/or Other Data Set **1028**. The figure's purpose is to show in a consolidated and organized list, examples of the data, handlers, and other logic that may constitute an AMC and are referred to one or more times in this disclosure. As shown, an example of data that may be included with or made accessible to an AMC, AMC XY **1064** in this case, may include the following: Pane Layout 1, 2 **1066** (generally, a Pane Layout is a layout of one or more Panes; Pane Layout **1066** is described in detail in FIGs. **6** and **8**) and associated Pane Configuration Parameters (PCP)s **1068a** (generally, PCPs may be dimensional data that may include values and/or references defining a Pane's position and size; PCPs **1068a** are described in detail in FIGs. **6** and **8**), Visual Designator X **1070**, Visual Designator Y **1072**, Tab Data Set **1074** (generally, a Tab Data Set may be one or more data structures containing Tab Data Attributes (generally, Tab Data Attributes are attributes associated with a Tab in a Tab Data Set; Tab Data Attributes may include Tab ID, Browser Window ID, Resource ID, and Visual Designator) for Tabs open in a Browser Application; the Tab Data Set **1074** may be used as part of a Tab Data Management System (TDMS) to help track which Tabs display the Resources and carry out the functions of an Array; an example of how a Tab Data Set is used in a TDMS is described in detail in FIGs. **12-16**), and Resource Data Set **1026**. As shown, the AMC XY **1064** may include the following handlers: one or more General Tab and Browser Window Event handlers **1076** (generally, General Tab and Browser Window Event handlers may be one or more handlers responsible for tracking events that may include Browser Window and/or Tab creation, Browser Window and/or Tab closing, and URI change), Array Tab tracking handlers **1078** (generally, an Array Tab tracking handler may be one or more handlers responsible for tracking an AMC's Tab Data Attribute Sets (generally, a Tab Data Attribute Set may be the Tab Data Attributes associated with a Tab) similar to what is described in FIGs. **12-16**), Array Generation Message (AGM) handlers **1080** (generally, an AGM handler is one or more handlers that receives an Array Generation Message (AGM) (generally, an AGM may be a message, triggered by an Array Generation Event initiating an Array Generation Process, that may continue the Array Generation Process upon reception by the AMC; the Array Generation Message may include 1) one or more Resource IDs and/or the Browser Window IDs and/or Tab IDs and/or

Rendered View IDs to be included in the intended Array and 2) information indicating to the AMC to generate and manage the intended Array; an AGM may include all, part, or none of a Resource Payload's elements, including a Resource's Visual Designator, for one or more Resource IDs conveyed in the AGM)), and Event X AMH **1082** (generally, an Event X AMH may be one or more Array Management Handlers (AMH)s that receives an Event X Message and may initiate an Array Responsive Action Process; more generally, an AMH may be a handler used in the generation, management, and governing of the behavior of one or more Arrays). As shown, an AMC may include the following other functions and logic: Resource – Pane Visual Designator Matching **1084** (the matching of a Pane and Resource by virtue of each being associated with a common Visual Designator; Resource – Pane Visual Designator Matching 1084 is described in greater detail in FIG. **11**), and Browser Window sizing and positioning **1086**.

[0122] To provide additional context for the description above, the following relates the information elements shown in FIG. **3** to those of the "Education" example: the AMC XY **1064** would be termed the AMC FC, to indicate that the AMC FC generates, manages, and governs the behavior of an Array associated with the Visual Designators Focus or Context; a Resource associated with Focus would be displayed on a Pane L, the left half of the Client Area **1030** of the Display Device **1010**; a Resource associated with Context would be displayed on a Pane R, the right half of the Client Area of the Display Device (while each Pane is associated to a specific Visual Designator in the "General" and "Education" examples herein, these relationships can be altered for a given AMC. For example, for AMC FC the Visual Designator Focus could be associated with Pane R and the Visual Designator Context could be associated with Pane L, thus, switching the side of the Display Device on which each Resource of the Array is displayed. In such a case, the same AMC FC might be better termed AMC CF. Likewise, a similar switch in the "General" example might make AMC XY **1064** better termed AMC YX.) The Pane Layout 1,2 **1066** and PCPs **1068a** would be the Pane Layout LR, composed of Pane L and Pane R defined by PCPs **1068a**; the Tab Data Set would be a Tab Data Set **1074** similar to that in the Tab Data Set **1074a** of FIGs. **12-16**; the Resource Data Set **1026** would include a Resource ID Data Set **1088** (shown and discussed in detail in FIG. **10**); the General Tab and Browser Window Event handlers **1076** would be those associated with the Tab Data Management System (TDMS) such as the TDMS described in detail for the Tab Data Set **1074a** of FIGs. **12-16**; the Array Tab tracking handler **1078** would be responsible for tracking an AMC FC's Tab Data Attribute Sets similar to what is described in the Tab Data Set FIGs. **12-16**; the AGM handler **1080** would receive one or

more AGMs; the Event X AMH **1082** could be that responsible for initiating (upon receiving a Navigate Message that continues a Navigation Process or other navigation process, from the third and fourth Resources associated with the Group Education, Sub-Group Ancient Rome, and Focus) an Array Responsive Action Process that initiates a navigation from the first Resource (one or more Google Map Views of the Colosseum) associated with the Group Education, Sub-Group Ancient Rome, third Focus Resource (a chapter of an eTextbook on Roman Engineering), and Context Visual Designator, to the first Resource (one or more Google Map Views of the Roman Forum) associated with the Group Education, Sub-Group Ancient Rome, fourth Focus Resource (an educational video on the Roman Forum), and Context Visual Designator; the Resource – Pane VD "matching" **1084** function would perform the function shown in the "matching" figure discussed below; and the Browser Window sizing and positioning **1086** function would size and position each Resource associated with Group Education, Sub-Group Ancient Rome, and Focus Visual Designator to the Pane L on the left half of the Client Area of the Display Device and size and position each Resource associated with Group Education, Sub-Group Ancient Rome, a Resource associated with Focus Resource, and Context Visual Designator to the Pane R on the right half of the Client Area of the Display Device.

[0123] FIG. **4** shows how some of the functional components of the Array Management Complex of the "General" example of FIG. **3** of system **1000** may be slightly modified to those of system **1001**. As shown, an example of data that may be included with or made accessible to an AMC, AMC XY **1065** in this case, may include the following: Pane Layout 1, 2 **1067** and associated PCPs **1069a**, Visual Designator X **1070**, Visual Designator Y **1072**, Rendered View Data Set **1075** (described in detail in FIGs. **17-21**), and Resource Data Set **1026**. As FIG. **9** will show, the Pane Layout 1, 2 **1067** and associated PCPs **1069a** differ from Pane Layout 1, 2 **1066** and associated PCPs **1068a** primarily because the former define Panes as areas within the Canvas Area **1031** of a single Browser Window **1013** while the latter define Panes as areas within the Client Area **1030**. As shown, the AMC XY **1065** (or any AMC) may include the following handlers: one or more General Rendered View, Tab, and Browser Window Event handlers **1077**, Array Rendered View tracking handlers **1079**, AGM handlers **1081**, and Event X AMH **1083**. These components differ from those of the "General" example primarily by adding an additional tracking layer and data element to take into account the presence of more than one Rendered View and the simultaneous display of the latter Rendered Views' Resources within a single Browser Window **1013**. As shown, an AMC may include the following other functions and logic: Resource – Pane Visual

Designator Matching **1085** and Rendered View sizing and positioning **1087**. These components differ from those of the "General" example primarily to account for their use of Panes defined within the Canvas Area **1031** of a single Browser Window **1013** rather than Panes defined by the entire Client Area **1030** of Display Device **1010**.

[0124] FIG. **5** is intended to help clarify several of the concepts and processes described in this disclosure by providing a visual representation that focuses on a "General" example of Visual Designators residing in a Visual Designator Data **1090** data structure that may be directly in and/or accessible by the AMC XY **1064**. This figure is provided for the sake of clarity and does not imply that Visual Designators must exist as a single data structure. The Visual Designators may be made available for use by the Application Controller **1040** and AMC XY **1064** in a variety ways including the following: as part of multiple data structures within the Resource Data Set **1026**; as part of the AMC XY **1064** and/or Application Controller **1040** code itself.

[0125] To provide additional context for the description above, the following relates the information elements shown in FIG. **5** to those of the "Education" example described throughout this disclosure: the Visual Designator X **1070** would correspond to the Visual Designator Focus; the Visual Designator Y **1072** would correspond to the Visual Designator Context.

[0126] FIG. **6** is intended to help clarify several of the concepts and processes described in this disclosure by providing a visual representation that focuses on a "General" example of how PCPs may exist and define Panes of a Pane Layout and each of those Panes may be associated with a Visual Designator (X or Y). As shown, each Pane, Pane 1 **1092** and Pane 2 **1094**, is defined by both Position and Size PCPs. The "x" and "y" coordinates of each are meant to provide a non-limiting visual representation of the concept of the Position and Size parameters that may be used to define a Pane in the Client Area **1030** of a Display Device **1010**. Position and Size can be calculated using a variety of variables and Display Device attributes and may be represented in a code base by characters other than "x" or "y"; the "x" and "y" coordinates are in no way related to the "X" and "Y" of Visual Designators X **1070** and Y **1072**.

[0127] Also, this example does not imply that PCPs must exist in the same form or structure shown in this figure. The PCPs may be made available for use by the AMC XY **1064** in a variety ways including the following: as part of multiple data structures within the Resource Data Set **1026**; as part of one or more structures within the Application Controller **1040** and/or AMC XY **1064** code itself.

[0128] PCPs may be composed of variables and Display Device attributes, PCPs define Panes, and Panes may be associated with one or more Visual Designators. The PCPs represented here also may be altered both in form and number.

[0129] It is important to note that the RSPP includes processes similar to the Array Generation Process and Array Responsive Action Process in which a Visual Designator may be the PCPs of a Pane itself.

[0130] To provide additional context for the description in the preceding paragraphs, the following relates the information elements shown in FIG. **6** to those of the "Education" example described earlier in this disclosure: Pane 1 **1092** would correspond to Pane L and the left half of the Client Area of the Display Device; the Visual Designator X **1070** with which Pane 1 is associated would correspond to the Visual Designator Focus; Pane 2 **1094** would correspond to Pane R and the right half of the Client Area of the Display Device; the Visual Designator Y **1072** with which Pane 2 is associated would correspond to the Visual Designator Context.

[0131] FIG. **7** shows how the PCPs and Panes of the "General" example of FIG. **6** of system **1000** may be slightly modified to those of system **1001**; the association of the PCPs and Panes with Visual Designators does not need to change.

[0132] As shown, each Pane, Pane 1 **1093** and Pane 2 **1095**, may be defined by both Position and Size PCPs. The "x" and "y" coordinates of each are meant to provide a non-limiting visual representation of the concept of the Position and Size parameters that may be used to define a Pane in the Canvas Area **1031** of a Browser Window **1013** of Display Device **1010**. Position and Size can be calculated using a variety of variables including those necessary to programmatically reposition and/or resize each Pane as the Browser Widow **1013** is repositioned and/or resized so that each Pane represents a relative portion of the Canvas Area **1031** rather than a fixed portion of the Display Device **1010**. For example, as the Canvas Area **1031** of Browser Window **1013** decreases in width and height, the variables of the parameters represented by the "x" and "y" coordinates in FIG. **7** may be used to affect a corresponding resize of the width and height of Pane 1 **1093** and Pane 2 **1095**. Doing so would ensure that each Pane maintains the same relative position and size within the available Canvas Area **1031** before and after a resize of Browser Window **1013**. As in FIG. **6** the PCP variables and attributes may be represented in a code base by characters other than "x" or "y"; and the "x" and "y" coordinates are in no way related to the Visual Designators X **1070** and Y **1072**.

[0133] FIG. **8** is intended to help clarify several of the concepts and processes described in this disclosure by providing a visual representation that focuses on a "General" example of how Panes may define areas on Display Device **1010** by virtue of each Pane's PCPs. As shown in this figure, it may be desirable to configure an Array of two Panes with each Pane occupying half of the Client Area **1030** of the Display Device **1010**. To ensure each Pane occupies "half" of the Client Area **1030** of any Display Device **1010**, it may be desirable to make the Position and Size parameters dependent on one or more attributes, including screen pixel location of the Display Device on which the Array will be displayed so that the Position and Size may vary between Display Devices as needed. PCPs can be calculated programmatically so that the Array Panes' Position and Size vary with the size, quality, and number of the user's Display Device in order to provide an Array in which Panes maintain a consistent relative position and size across Display Devices. In this figure, Pane 1 **1092** is defined by the PCP coordinates associated with Pane 1 in FIG. **6** and Pane 2 **1094** is defined by the PCP coordinates associated with Pane 2 in FIG. **6**. It is important to note that each Pane Layout may be altered both in form and number of Panes and that more than one Pane Layout may be made available to one or more AMCs. For example, Pane Layout 1, 2 **1066** may be altered so that Pane 1 **1092** and Pane 2 **1094** each compose less than half of the Client Area **1030** of the Display Device **1010**; also, another Pane Layout, Pane Layout 1, 2, 3 may exist that fits Pane 1 to the left half, Pane 2 to the right top half, and Pane 3 to the bottom right half of the Client Area of the Display Device; the latter Pane Layout 1, 2, 3 maybe associated with an AMC ZYX. There are many possible configurations including those that include multiple display devices.

[0134] To provide additional context for the description above, the following relates the information elements shown in FIG. **8** to those of the "Education" example described throughout this disclosure: Pane 1 **1092** would correspond to Pane L and the left half of the Client Area of the Display Device and constitute one Pane of the Pane Layout L, R of the Array to be generated and managed by the AMC FC; Pane 2 **1094** would correspond to Pane R and the right half of the Client Area of the Display Device and constitute one Pane of the Pane Layout L, R of the Array to be generated and managed by the AMC FC.

[0135] FIG. **9** shows how the PCPs and Panes of the "General" example of system **1000** of FIG. **8** may be slightly modified to those of system **1001**. FIG. **9** provides a visual representation of an example of how Panes may define areas on the Canvas Area **1031** of a Browser Window **1013** of Display Device **1010** by virtue of each Pane's PCPs. As shown in this figure, it may be desirable to configure an Array of two Panes with each Pane occupying

half of the Canvas Area **1031** of the Browser Window **1013** of Display Device **1010**. To ensure each Pane occupies "half" of the Canvas Area **1031**, it may be desirable to make the Position and Size parameters dependent on one or more variables and/or attributes, including the size and position of the Canvas Area of the Browser Window **1013** in which the Array will be displayed. PCPs can be calculated programmatically so that the Array Panes' Position and Size vary with the those of the Browser Window **1013** in order to provide an Array in which Panes maintain a consistent relative position and size. In this figure, Pane 1 **1093** is defined by the PCP coordinates associated with Pane 1 in FIG. **7** and Pane 2 **1095** is defined by the PCP coordinates associated with Pane 2 in FIG. **7**. It is important to note that each Pane Layout may be altered both in form and number of Panes and that more than one Pane Layout may be made available to one or more AMCs. There are many possible configurations including those that include multiple display devices.

[0136] FIG. **10** is intended to help clarify several of the concepts and processes described in this disclosure by providing a visual representation that focuses on a "General" example of a Resource ID Data Set **1088** structure and how a Resource of a Resource Set may exist and be associated with a Visual Designator and associated with a Pane defined by PCPs. The Resource Data attributes listed under each Resource "i", are those Resource ID Data Attributes commonly part of each Resource's Resource ID Data Attribute Set. However, this example does not imply that the Resource ID Data Attributes shown in this figure must exist in the form and structure of a Resource ID Data Attribute Set. There are a number of ways in which the Resource ID Data Attributes shown in this figure may be organized, structured, and made available to the Application Controller and AMC XY as part of the Resource Data Set **1026** for use in the RSPP. Each Resource of a Resource Set may be associated with a Visual Designator that has been associated with a Pane defined by PCPs. As noted, the RSPP includes processes similar to the Array Generation Process and Array Responsive Action Process in which a Visual Designator may be the PCPs of a Pane itself.

[0137] In this "General" example, each Resource associated with a Visual Designator Y is associated with a specific Resource associated with a Visual Designator X. For example, there is a Resource 3 with the Resource Data attributes: Resource ID 3, URI 5, Group 1, Tag 1A, and VD X. Also, there is a Resource 5 with the Resource Data attributes: Resource ID 5, URI 7, Group 1, Tag 1A, Resource 3, and VD Y. For another example there is a Resource 4 with the Resource Data attributes: Resource ID 4, URI 6, Group 1, Tag 1A, and VD X. Also, there is a Resource 6 with the Resource Data attributes: Resource ID 6, URI 8, Group 1, Tag 1A, Resource 4, and VD Y. As shown, Resource 5 has been associated with Resource 3 and,

as such, has been given the attribute Resource 3 indicating it is associated with that specific Resource; Resource 3 is not given the attribute Resource 5. However, each set of Resources associated with a Visual Designator do not have to be linked to a specific Resource within the Resource Set that has been associated with a different Visual Designator. For example, Resources 5 and 6 still could be associated with a Visual Designator Y for Group 1, Sub-Group Tag 1A by removing the linkage of each to Resource 3 and Resource 4, respectively. More generally, each Resource of a Resource Set may be associated with a Visual Designator that has been associated with a Pane defined by PCPs.

[0138] To provide additional context for the description above, the following relates the information elements shown in FIG. **10** to those of the "Education" example described throughout this disclosure: Resource 3 could correspond to the chapter of an eTextbook on Roman Engineering; Resource 3's Visual Designator X would be a Visual Designator Focus; Resource 4 could correspond to the educational video on the Roman Forum; Resource 4's Visual Designator X would be a Visual Designator Focus; Resource 5 could correspond to the one or more Google Map Street views of the Colosseum and be linked to Resource 3; Resource 5's Visual Designator Y would be a Visual Designator Context; Resource 6 could correspond to the one or more Google Map Street views of the Roman Forum and be linked to Resource 4; Resource 6's Visual Designator Y would be a Visual Designator Context.

[0139] FIG. **11** is intended to help clarify several of the concepts and processes described in this disclosure by providing a visual representation that focuses on a "General" example of AMC XY **1064** having matched Resources of a Resource Set, each with a Pane of a Pane Layout defined by PCPs by virtue of the Visual Designators each Resource - Pane Pair has in common. This figure does not represent how this data would exist within either the Application Controller **1040**, AMC XY **1064** or the Resource Data Set **1026**. For example, Resource ID may be used in place of the concept of a Resource to affect the "matching" of a Resource and Pane by virtue of a common Visual Designator. Instead, the figure is meant to clarify that the function of "matching" Resources of a Resource Set and Panes of a Pane Layout may be carried out by the AMC. As noted, the RSPP may include processes similar to the Array Generation Process and Array Responsive Action Process in which a Visual Designator may be the PCPs of a Pane itself. In such a case, a component, similar in function to an AMC, may utilize a Visual Designator, or the immediate association between a Resource and a Pane, directly to affect the intended positioning of a Resource to a Pane of the Client Area **1030** (or, using the components of system **1001**, to a Pane of the Canvas Area **1031** of Browser Window **1013**).

[0140] To provide additional context for the description above, the following relates the information elements shown in FIG. **11** to those of the "Education" example described throughout this disclosure: Resource 3 could correspond to the chapter of an eTextbook on Roman Engineering; Resource 3's Visual Designator X would be a Visual Designator Focus; Pane L would correspond to the left half of the Client Area of the Display Device and constitute one Pane of the Pane Layout LR of the Array to be generated and managed by the AMC FC; the chapter of an eTextbook on Roman Engineering would be associated with the left half of the Client Area of the Display Device through "matching" by the AMC FC; Resource 5 could correspond to the one or more Google Map Street views of the Colosseum and be linked to Resource 3; Resource 5's Visual Designator Y would be a Visual Designator Context; Pane R would correspond to the right half of the Client Area of the Display Device and constitute one Pane of the Pane Layout LR of the Array to be generated and managed by the AMC FC; the one or more Google Map Street views of the Colosseum would be associated with the right half of the Client Area of the Display Device through "matching" by the AMC FC.

[0141] FIGs. **12**, **13**, **14**, **15**, **16**, are intended to help clarify several of the concepts and processes associated with the use of a Tab Data Management System (TDMS) in one or more variants of the Array Generation Process and Array Responsive Action Process by providing a visual representation that focuses on a "General" example based on system **1000** components of how a TDMS may exist and in coordination with one or more AMCs, including an AMC XY **1064**, accomplish goals including the following three: 1) reducing the number of tabs and browser windows open and displayed in a Display Device **1010** at a given time; 2) reducing the processing burden on the Local Computing Device **1002**; and 3) reducing instances of code used for one or more variants of the Array Generation Process and Array Responsive Action Process and thus, the burden on initial development and subsequent maintenance of the code base.

[0142] In one of its simplest forms, the Array Generation Process, using the components of system **1000**, may generate an Array by generating a new tab and browser window for each Array Resource of an Array. In circumstances in which Array generation occurs infrequently and/or the number of possible Arrays and/or Array Types (in terms of Pane Layout, Array Type behavior, etc.) is limited to one or a few, a less robust or no TDMS may be desirable. However, as the frequency of Array generation and/or the number of possible Arrays and/or Array Types increases, a more robust TDMS becomes increasingly important in order to accomplish the three goals stated above.

[0143] A TDMS may exist and in coordination with one or more AMCs, including an AMC XY **1064**, accomplish the three goals mentioned above while providing the Application Controller the ability to generate and manage multiple Array Types and Instances. As shown in each figure, there are several data elements the TDMS can incorporate into a Tab Data Set **1074**. In this "General" example showing Tab Data Set **1074a**, each column of data elements has a header, Tab "i", with seven data elements listed under it. Each Tab "i" represents a single Tab **1014** open in a Browser Application **1032**. The seven data elements under Tab "i" are its Tab Data Attributes. The set of seven Tab Data Attributes are collectively a Tab Data Attribute Set (the seven Tab Data Attributes listed do not imply that Tab Data Attributes must be limited to these seven). For example, Tab "3"'s Tab Data Attribute Set, third from the left on the top row of FIG. **14**, shows the following Tab Data Attributes for Tab "3": Tab ID 3, Window ID 1, Resource ID 3, VD X, Related Tab ID 15, None, and AMC ID XY. Tab ID 3 is the Tab ID assigned to Tab "3" by the Browser Application **1032**. Resource ID 3 is the Resource ID of the Resource displayed in Tab "3". Window ID 1 is the Window ID assigned to the Browser Window **1012** in which Tab "3" is displayed. VD X is the Visual Designator associated with Resource 3. Related Tab ID 15 is the Tab ID of the Tab displaying the second Resource of the Array of which Resource 3 of Tab "3" is a part. None indicates there is not another related Tab in the Array of which Resource 3 of Tab "3" is a part. AMC ID XY is the attribute that indicates both that a Tab is part of an existing Array and which AMC is managing the existing Array; the XY is meant to represent that the AMC managing the Array is one managing an Array with two Visual Designators, X and Y, each of which may correspond to a single Pane of the Array's Pane Layout and a Resource of a Resource Set. As indicated, Tab "15" is the second Array Tab of the Array of which Tab "3" and Tab "15" are a part. As shown in FIG. **14**, Tab "15" displays Resource 5 which is associated with the VD Y and Tab ID 3 of Tab "3".

[0144] FIG. **12**: During the lifecycle of a Tab, the Tab Data Attributes will be formed and updated by the TDMS. In this example, the TDMS is assumed to be a set of shared handlers and logical components from one or more AMCs, including AMC XY **1064**. As shown in this figure, Tab "3" comes into existence displaying a page of a non-Resource URI. The TDMS may contain one or more handlers that listen for and capture Tab creation events. Upon receiving the Tab ID (Tab ID 3) and Browser Window ID (Window ID 1) assigned to the newly created Tab, the TDMS can respond by creating a new Tab Data Attribute Set and writing Tab ID 3 and Window 1 to the Tab ID and Window ID Tab Data Attributes, respectively. In this example, Tab "3" initially displays the page of a non-Resource URI,

www.google.com. As implied in this figure, the Application Controller **1040** and/or AMC, including AMC XY **1064**, can retrieve and/or receive the URI of Tab "3", and check the URI against the URIs of existing Resources. In the case where the URI is found to be a non-Resource URI, as in this example, the TDMS may write the URI to the Tab Data Attribute set. Because Tab "3" displays a Non-Array, non-Resource, there are no Tab Data Attributes for Visual Designator or related tabs at this point.

[0145] The last Tab Data Attribute shown is TNAT. In order to minimize the number of open tabs, an AMC may recognize Targeted Non-Array Tabs (TNAT)s. Each AMC may have unique criteria for determining what tabs will constitute that AMC's TNATs. For example, one AMC may target only tabs displaying a page of a URI of an email provider or a Non-Array Tab displaying the same Resource as an Array Tab while another AMC may target only tabs displaying www.google.com or a Non-Array Tab displaying the same Resource as an Array Tab. The "General" example for this figure assumes that each AMC has the same criteria for determining a TNAT and only target tabs displaying www.google.com or a Non-Array Tab displaying the same Resource as an Array Tab. Therefore, as shown in this figure, Tab "3"'s initial URI, www.google.com, gets recognized as that of a TNAT and has that attribute written to its Tab Data Attributes. In this figure, Tab "15"'s Tab Data Attributes are the same as those of Tab "3".

[0146] FIG. **13**: Later in Tab "3"'s lifecycle its URI might change to that of a Resource URI, such as one of Resource 3's URIs. The Application Controller **1040** and/or AMC, including AMC XY **1064**, can receive indications of and respond to the URI change event by checking the Tab's new URI against existing Resource URIs and replacing the existing Tab's former URI, www.google.com, with the URI and/or Resource ID identifying the URI as that of an existing Resource. In this case, Tab "3"'s URI changes to a URI of Resource ID 3 and has that ID written to its Tab Data Attribute Set. Once the page of the URI displayed has been determined to be that of a Resource, the TDMS, Application Controller **1040** and/or AMC, including AMC XY **1064**, can retrieve the one or more Visual Designators associated with the Resource ID and write this Visual Designator as a Tab Data Attribute. In this example, the Visual Designator is VD X. Because Tab "3" displays a Non-Array Resource, Tab "3" does not have Tab Data Attributes for related tabs or an AMC. Tab "3"'s TNAT attribute gets removed because Tab "3" no longer meets the TNAT criteria of the AMCs. However, Tab "15", still displaying www.google.com, remains a TNAT and as a TNAT maybe targeted by an AMC during an Array Generation Process. The following figure, FIG. **14**, assumes an Array Generation Process is initiated for AMC XY **1064**.

[0147] FIG. **14:** Frequently, and as assumed in this example, Arrays may be generated from an Application UI in a displayed Resource Page. The tab displaying a Resource Page and Application UI from which an Array Generation Event and AGM is initiated may be specified in the AGM as one to be included in the Array to be created, managed, and whose behavior may be governed by the AMC; the latter is assumed in this example as well and, thus, the AMC XY **1064** writes its ID, AMC ID XY, as a Tab Data Attribute of Tab "3", acknowledging that Tab "3" is one of the tabs AMC XY **1064** will manage and govern during the lifecycle of the Array it will manage. AMC XY **1064** may also retrieve Tab "3"'s Resource ID, Resource ID 3, and Visual Designator, VD X. This example assumes that the Resources associated with VD Y are associated to the Resources associated with VD X (this relationship is the same as that between Resources associated with Focus (VD X) and Resources associated with Context (VD Y) as discussed in the "Education" example used throughout this disclosure). Therefore, upon receiving Resource ID 3, the AMC XY **1064** can understand that it will need to retrieve the Resource ID and Visual Designator for a Resource associated with Resource 3. The AMC XY **1064** may first retrieve the Resource ID of one of Resource 3's related Resources by querying the Resource Data Set **1026** which contains this information for Resource 3. Once this Resource ID is received the AMC XY **1064** can then retrieve the Visual Designator from the latter Resource ID's Resource Data in the Resource Data Set **1026**. This example assumes the Resource ID is Resource ID 5 and its Visual Designator is Y. Upon receiving the information defining what Resource and Visual Designator the AMC XY **1064** will need to complete its Array, the AMC XY may query the Tab Data Set **1074a** to determine whether a TNAT (either a Non-Array Tab exists displaying Resource ID 5 or www.google.com) exists that it can use as the second tab of its Array to avoid needlessly generating a new tab. In this case, such a query identifies Tab "15" as a TNAT and returns that information to the AMC XY **1064**. The Application Controller **1040** and/or AMC XY **1064** may then affect the process to change Tab "15"'s displayed page to that of the page of the URI of Resource 5 and incorporate Tab "15" into the Array containing Tab "3", ultimately writing to Tab "15"'s Tab Data Attributes the AMC XY's ID, AMC ID XY. In addition, in order to differentiate the Array containing Tabs "3" and "15" from another AMC XY Array (such as that containing Tabs "5" and "8"), the AMC XY **1064** can also write to Tab "3"'s Tab Data Attribute Set that it is related to Tab "15" and to Tab "15"'s Tab Data Attribute Set that it is related to Tab "3".

[0148] The Tab Data Attribute Sets for Tab "3" and "15" in this figure reflect that the Array Generation Process has completed for Tab "3" and Tab "15". For the next figure it is

important to note that in this figure Tab "4" displays the Resource Page of a URI of Resource ID 4 which is associated with VD X, that Tab "16" displays the Resource Page of a URI of Resource ID 6 which is associated with VD Y, and neither Tab "4" nor "16" have been assigned a TNAT attribute.

[0149] FIG. **15**: This figure assumes that some time after the Array Generation Process has been completed for Tab "3" and "15", an Array Responsive Action Process is initiated for the Array by affecting a Navigation Process or other navigation process in Tab "3" from the Resource Page of a URI of Resource ID 3 to the Resource Page of a URI of Resource ID 4. Because, in this example, the Resources in the Array associated with VD Y are associated with a specific Resource in the Array associated with VD X, the navigation from a URI of Resource ID 3 to that of a URI of Resource ID 4 affects a responsive Navigation Process or other navigation process in Tab "15" from the URI of Resource ID 5 which is associated specifically to Resource ID 3 to that of a URI of Resource ID 6 which is associated specifically to Resource ID 4. As the events occur that generate data elements constituting the Tab Data Attributes for the Tab Data Attribute Sets for Tab "3" and Tab "15", each may be written to the Tab Data Set, updating the Tab Data Set to reflect the current state of each Tab, its displayed Resource, and the relationship of both to the Array of which they are a part.

[0150] The Tab Data for Tab "3" and "15" in FIG. **15** reflects that the Array Responsive Action Process has completed for Tab "3" and Tab "15". This figure also shows Tab "4" and "16" both now have become TNAT. The reason for the latter being that each tab now displays a Non-Array Resource that is the same as an Array Resource; Tab "4" displays a Resource Page of the URI of Resource ID 4 which, for this example, is the same Resource Page of the URI of Resource ID 4 displayed in Tab "3"; Tab "16" displays a Resource Page of the URI of Resource ID 6 which, for this example, is the same Resource Page of the URI of Resource ID 6 displayed in Tab "15".

[0151] FIG. **16**: This figure shows Tab "15" has been deleted and replaced in the Array governing Tab "3" with Tab "16", formerly a TNAT. Tab "3" now reflects that it is related to Tab "16" and Tab "16" reflects that it is now related to Tab "3".

[0152] As described, during one or more variants of both the Array Generation Process and Array Responsive Action Process a TDMS in coordination with one or more AMCs may track and manage the tabs of one or more Arrays of one or more Array Types while reducing 1) the number of tabs and browser windows open and displayed in a Display Device **1010** at a given time; 2) the processing burden on the Local Computing Device **1002**; and 3) instances of code used for one or more variants of the Array Generation Process and Array

Responsive Action Process and thus, the burden on initial development and subsequent maintenance of the code base. As noted, the RSPP may include processes similar to the Array Generation Process and Array Responsive Action Process in which a Visual Designator may be the PCPs of a Pane itself. Also as noted, in such a case, a component, similar in function to an AMC, may utilize a Visual Designator, or the immediate association between a Resource and a Pane, directly to affect the intended positioning of a Resource to a Pane of the Client Area **1030.** During the processes similar to the Array Generation Process and Array Responsive Action Process in which a Visual Designator may be the PCPs of a Pane itself, this component, in coordination with a TDMS variant similar to the example TDMS described in FIGs. **12-16**, may track and manage the tabs of one or more groups of Resources.

[0153] FIGs. **17**, **18**, **19**, **20**, **21**, are intended to help clarify several of the concepts and processes associated with the use of a Rendered View Data Management System (RVDMS) in one or more variants of the Array Generation Process and Array Responsive Action Process by providing a visual representation that focuses on an example based on system **1001** components of how a RVDMS may exist and in coordination with one or more AMCs, including an AMC XY **1065,** accomplish goals including the following three: 1) reducing the number of Rendered Views, tabs, and browser windows open and displayed in a Display Device **1010** at a given time; 2) reducing the processing burden on the Local Computing Device **1002**; and 3) reducing instances of code used for one or more variants of the Array Generation Process and Array Responsive Action Process and thus, the burden on initial development and subsequent maintenance of the code base.

[0154] In one of its simplest forms, the Array Generation Process, using the components of system **1001**, may generate an Array by generating either a new Rendered View within a single browser window for each Array Rendered View of an Array or a new browser window and/or tab for each Array Tab of an Array. In circumstances in which Array generation occurs infrequently and/or the number of possible Arrays and/or Array Types (in terms of Pane Layout, Array Type behavior, etc.) is limited to one or a few, a less robust or no RVDMS may be desirable. However, as the frequency of Array generation and/or the number of possible Arrays and/or Array Types increases, a more robust RVDMS becomes increasingly important in order to accomplish the three goals stated above.

[0155] A RVDMS may exist and in coordination with one or more AMCs, including an AMC XY **1065**, accomplish the three goals mentioned above while providing the Application Controller the ability to generate and manage multiple Array Types and Instances. As shown

in each figure, there are several data elements the RVDMS can incorporate into a Rendered View Data Set **1075**. In this example showing Rendered View Data Set **1075a**, each column of data elements has a header, RV "i", with eight data elements listed under it. Each RV "i" represents a single Rendered View of a Browser Application **1033**. The eight data elements under RV "i" are its Rendered View Data Attributes. The set of eight Rendered View Data Attributes are collectively a Rendered View Data Attribute Set (the eight Rendered View Data Attributes listed do not imply that Rendered View Data Attributes must be limited to these eight). For example, RV "3"'s Rendered View Data Attribute Set, third from the left on the top row of FIG. **19**, shows the following Rendered View Data Attributes for RV "3": RV ID 3, Tab ID 3, Window ID 1, Resource ID 3, VD X, Related RV ID 15, None, and AMC ID XY. RV ID 3 is the RV ID assigned to RV "3" by the Browser Application **1033**. Tab ID 3 is the Tab ID of the Tab in which Resource 3 is displayed. Resource ID 3 is the Resource ID of the Resource displayed in RV "3". Window ID 1 is the Window ID assigned to the Browser Window **1013** in which RV "3" is displayed. VD X is the Visual Designator associated with Resource 3. Related RV ID 15 is the RV ID of the RV displaying the second Resource of the Array of which Resource 3 of RV "3" is a part. None indicates there is not another related RV in the Array of which Resource 3 of RV "3" is a part. AMC ID XY is the attribute that indicates both that a RV is part of an existing Array and which AMC is managing the existing Array; the XY is meant to represent that the AMC managing the Array is one managing an Array with two Visual Designators, X and Y, each of which may correspond to a single Pane of the Array's Pane Layout and a Resource of a Resource Set. As indicated, RV "15" is the second Array Rendered View of the Array of which RV "3" and RV "15" are a part. As shown in FIG. **19**, RV "15" displays Resource 5 which is associated with the VD Y and RV ID 3 of RV "3".

[0156] FIG. **17**: During the lifecycle of a RV, the Rendered View Data Attributes will be formed and updated by the RVDMS. In this example, the RVDMS is assumed to be a set of shared handlers and logical components from one or more AMCs, including AMC XY **1065**. As shown in this figure, RV "3" comes into existence displaying a page of a non-Resource URI. The RVDMS may contain one or more handlers that listen for and capture events indicating RV creation. Upon receiving the RV ID (RV ID 3), Tab ID, and Browser Window ID (Window ID 1) assigned to the newly created RV, the RVDMS can respond by creating a new Rendered View Data Attribute Set and writing RV ID 3, Tab 3, and Window 1 to the RV ID, Tab ID, and Window ID Rendered View Data Attributes, respectively. In this example, RV "3" initially displays the page of a non-Resource URI, www.google.com. As implied in

this figure, the Application Controller **1041** and/or AMC, including AMC XY **1065**, can retrieve and/or receive the URI of RV "3", and check the URI against the URIs of existing Resources. In the case where the URI is found to be a non-Resource URI, as in this example, the RVDMS may write the URI to the Rendered View Data Attribute set. Because RV "3" displays a Non-Array, non-Resource, there are no Rendered View Data Attributes for Visual Designator, or related Rendered Views at this point.

[0157] The last Rendered View Data Attribute shown is TNARV. In order to minimize the number of open Rendered Views, tabs, and browser windows an AMC may recognize Targeted Non-Array Rendered Views (TNARV)s. Each AMC may have unique criteria for determining what Rendered Views will constitute that AMC's TNARVs. For example, one AMC may target only Rendered Views displaying a page of a URI of an email provider or a Non-Array Rendered View displaying the same Resource as an Array Rendered View while another AMC may target only Rendered Views displaying www.google.com or a Non-Array Rendered View displaying the same Resource as an Array Rendered View. The example for this figure assumes that each AMC has the same criteria for determining a TNARV and only targets Rendered Views displaying www.google.com, www.bing.com or a Non-Array Rendered View displaying the same Resource as an Array Rendered View. Therefore, as shown in this figure, RV "3"'s initial URI, www.google.com, gets recognized as that of a TNARV and has that attribute written to its Rendered View Data Attributes. Likewise RV "15"'s initial URI, www.bing.com, gets recognized as that of a TNARV and has that attribute written to its Rendered View Data Attributes.

[0158] FIG. **18**: Later in RV "3"'s lifecycle its URI might change to that of a Resource URI, such as one of Resource 3's URIs. The Application Controller **1041** and/or AMC, including AMC XY **1065**, can receive indications of and respond to the URI change event by checking the RV's new URI against existing Resource URIs and replacing the existing RV's former URI, www.google.com, with the URI and/or Resource ID identifying the URI as that of an existing Resource. In this case, RV "3"'s URI changes to a URI of Resource ID 3 and has that ID written to its Rendered View Data Attribute Set. Once the page of the URI displayed has been determined to be that of a Resource, the RVDMS, Application Controller **1041** and/or AMC, including AMC **1065**, can retrieve the one or more Visual Designators associated with the Resource ID and write this Visual Designator as a Rendered View Data Attribute. In this example, the Visual Designator is VD X. Because RV "3" displays a Non-Array Resource, RV "3" does not have Rendered View Data Attributes for related Rendered Views or an AMC. RV "3"'s TNARV attribute gets removed because RV "3" no longer

meets the TNARV criteria of the AMCs. However, RV "15", still displaying www.bing.com, remains a TNARV and as a TNARV maybe targeted by an AMC during an Array Generation Process. The following figure, FIG. **19**, assumes an Array Generation Process is initiated for AMC XY **1065**.

[0159] FIG. **19**: Frequently, and as assumed in this example, Arrays may be generated from an Application UI in a displayed Resource Page. The Rendered View of a Resource Page and Application UI from which an Array Generation Event and AGM is initiated may be specified in the AGM as one to be included in the Array to be created, managed, and whose behavior may be governed by the AMC; the latter is assumed in this example as well and, thus, the AMC XY **1065** writes its ID, AMC ID XY, as a Rendered View Data Attribute of RV "3", acknowledging that RV "3" is one of the Rendered Views AMC XY **1065** will manage and govern during the lifecycle of the Array it will manage. AMC XY **1065** may also retrieve RV "3"'s Resource ID, Resource ID 3, and Visual Designator, VD X. This example assumes that the Resources associated with VD Y are associated to the Resources associated with VD X (this relationship is the same as that between Resources associated with Focus (VD X) and Resources associated with Context (VD Y) as discussed in the "Education" example used throughout this disclosure). Therefore, upon receiving Resource ID 3, the AMC XY **1065** can understand that it will need to retrieve the Resource ID and Visual Designator for a Resource associated with Resource 3. The AMC XY **1065** may first retrieve the Resource ID of one of Resource 3's related Resources by querying the Resource Data Set **1026** which contains this information for Resource 3. Once this Resource ID is received the AMC XY **1065** can then retrieve the Visual Designator from the latter Resource ID's Resource Data in the Resource Data Set **1026**. This example assumes the Resource ID is Resource ID 5 and its Visual Designator is Y. Upon receiving the information defining what Resource and Visual Designator the AMC XY **1065** will need to complete its Array, the AMC XY may query the Rendered View Data Set **1075a** to determine whether a TNARV (either a Non-Array Rendered View exists displaying Resource ID 5 or www.google.com or www.bing.com) exists that it can use as the second Rendered View of its Array to avoid needlessly generating a new Rendered View and/or tab, and browser window. In this case, such a query identifies RV "15" as a TNARV and returns that information to the AMC XY **1065**. The Application Controller **1041** and/or AMC XY **1065** may then affect the process to change RV "15"'s displayed page to that of the page of the URI of Resource 5 and incorporate RV "15" into the Array containing RV "3", ultimately writing to RV "15"'s Rendered View Data Attributes the AMC XY's ID, AMC ID XY. In addition, in order to

differentiate the Array containing RV "3" and "15" from another AMC XY Array (such as that containing RV "5" and "8"), the AMC XY **1065** can also write to RV "3"'s Rendered View Data Attribute Set that it is related to RV "15" and to RV "15"'s Rendered View Data Attribute Set that it is related to RV "3".

[0160] The Rendered View Data Attribute Sets for RV "3" and "15" in this figure reflect that the Array Generation Process has completed for RV "3" and RV "15". For the next figure it is important to note that in this figure RV "4" displays the Resource Page of a URI of Resource ID 4 which is associated with VD X, that RV "16" displays the Resource Page of a URI of Resource ID 6 which is associated with VD Y, and neither RV "4" nor "16" have been assigned a TNARV attribute.

[0161] FIG. **20**: This figure assumes that some time after the Array Generation Process has been completed for RV "3" and "15", an Array Responsive Action Process is initiated for the Array by affecting a Navigation Process or other navigation process in RV "3" from the Resource Page of a URI of Resource ID 3 to the Resource Page of a URI of Resource ID 4. Because, in this example, the Resources in the Array associated with VD Y are associated with a specific Resource in the Array associated with VD X, the navigation from a URI of Resource ID 3 to that of a URI of Resource ID 4 affects a responsive Navigation Process or other navigation process in RV "15" from the URI of Resource ID 5 which is associated specifically to Resource ID 3 to that of a URI of Resource ID 6 which is associated specifically to Resource ID 4. As the events occur that generate data elements constituting the Rendered View Data Attributes for the Rendered View Data Attribute Sets for RV "3" and RV "15", each may be written to the Rendered View Data Set, updating the Rendered View Data Set to reflect the current state of each Rendered View, its displayed Resource, and the relationship of both to the Array of which they are a part.

[0162] The Rendered View Data for RV "3" and "15" in FIG. **20** reflects that the Array Responsive Action Process has completed for RV "3" and RV "15". This figure also shows RV "4" and "16" both now have become TNARV. The reason for the latter being that each Rendered View now displays a Non-Array Resource that is the same as an Array Resource; RV "4" displays a Resource Page of the URI of Resource ID 4 which, for this example, is the same Resource Page of the URI of Resource ID 4 displayed in RV "3"; RV "16" displays a Resource Page of the URI of Resource ID 6 which, for this example, is the same Resource Page of the URI of Resource ID 6 displayed in RV "15".

[0163] FIG. **21**: This figure shows RV "15" has been deleted and replaced in the Array governing RV "3" with RV "16", formerly a TNARV. RV "3" now reflects that it is related to RV "16" and RV "16" reflects that it is now related to RV "3".

[0164] As described, during one or more variants of both the Array Generation Process and Array Responsive Action Process a RVDMS in coordination with one or more AMCs can track and manage the Rendered Views of one or more Arrays of one or more Array Types while reducing 1) the number of Rendered Views, tabs, and browser windows open and displayed in a Display Device **1010** at a given time; 2) the processing burden on the Local Computing Device **1002**; and 3) instances of code used for one or more variants of the Array Generation Process and Array Responsive Action Process and thus, the burden on initial development and subsequent maintenance of the code base. As noted, the RSPP may include processes similar to the Array Generation Process and Array Responsive Action Process in which a Visual Designator may be the PCPs of a Pane itself. Also as noted, in such a case, a component, similar in function to an AMC, may utilize a Visual Designator, or the immediate association between a Resource and a Pane, directly to affect the intended positioning of a Resource to a Pane of the Canvas Area **1031** of Browser Window **1013**. During the processes similar to the Array Generation Process and Array Responsive Action Process in which a Visual Designator may be the PCPs of a Pane itself, this component, in coordination with a RVDMS variant similar to the example RVDMS described in FIGs. **17-21**, may track and manage the Rendered Views of one or more groups of Resources.

[0165] FIGs. **22** and **23** illustrate a "General" example based on system **1000** components of the messaging processes for variants of the Navigation Process, Array Generation Process, and Array Responsive Action Process that include the use of the Browser-bound AUI **1020**. While following the "General" example, as indicated by the AMC XY **1064** shown in each figure, the figures illustrate and label many other components, sub-components, and data elements in a more conceptual way in order to represent (within the confines of a reasonably sized figure) the wide variety of Arrays, Array Types and Behavior, and responsive actions that may be incorporated in the messaging processes described below using system **1000**. The labeling system is mostly the same as that described in FIG. **1**. The subscript "1" will represent the first instance of a component, sub-component, or data element; the subscript "i" will represent one or more additional instances of the same. However, because each AMC may fulfill a different function, the concept of an "i" number of AMCs is represented slightly differently. In keeping with the "General" example, AMC XY **1064** embodies the first instance of an AMC; AMC i represents an "i" number of additional AMCs, each of which

may be unique and create, manage, and govern the behavior of one or more Arrays of a unique Array Type.

[0166] In this example, the Browser-bound AUI **1020** is shown directly incorporated into the Browser Window **1012** of Display Device **1010** rather than in the Resource Page **1016** displayed in Browser Window **1012**. The positioning of the Browser-bound AUI **1020** in the top-right corner of the Browser Window **1012**, thus overlapping what would otherwise be the top-right corner of Resource Page **1016** area, is merely for the sake of example and other implementations, positioning, sizing, configurations, etc. are possible. For example, with slight modification of system **1000** components, the AUI represented in these figures as a Browser-bound AUI **1020** could be made to display and behave as a Page-bound AUI **1022** or **1024**.

[0167] The Browser-bound AUI **1020** may take several forms, including the Dynamic Navigation UI and Resource Formation UI. In this example, two elements that may be part of a DNUI, the Navigation Specific UI Element **1096** and the Array Generation Specific UI Element **1098** (generally, an Array Generation Specific UI Element is an AUI element the selection of which may trigger an event initiating an Array Generation Process), are shown in the Browser-bound AUI **1020** and their communication with other components of system **1000** are described in detail. While the UI elements are often part of the DNUI, the method of communication between these or other similar elements in other AUIs and the Application may utilize the same system components and many of the same processes described herein. For this reason and that these other AUIs are not an essential part of the Navigation Process, Array Generation Process, and Array Responsive Action Process described herein, the description only includes the two AUI elements mentioned above in the example Browser-bound AUI **1020** and its inclusion in the messaging processes for the Navigation Process, Array Generation Process, and Array Responsive Action Process.

[0168] Because it offers a simplified view focusing on the elements often part of the Navigation Process, it may be useful to refer to just FIG. **22** for the following paragraph. Once a Resource Page $\mathbf{1016_1}$ has been recognized as part of a Resource Set, the Browser-bound AUI $\mathbf{1020_1}$, in the form of the Browser-bound DNUI $\mathbf{1020a_1}$, may serve as both the starting and ending point of the Navigation Process. The start of the process may begin with the explicit representation on the Browser-bound DNUI $\mathbf{1020a_1}$ of the current Resource Page's $\mathbf{1016_1}$ place within the scope and sequence of the Resource Set of which the Resource Page is a part. Navigation Specific UI Elements $\mathbf{1096_1}$ on the Browser-bound DNUI $\mathbf{1020a_1}$, such as a directional arrows or buttons indicating the sequence such as "Next" and

"Previous", are displayed in order to provide the means with which one or more Resources in the Resource Set can be accessed according to the Resource Set's creator's intended scope and sequence. One possible example of such a Navigation Specific UI Element **1096** is shown. In this example the "X" represents the displayed Resource's order within the numbered scope of the Resource Set of which the Resource is a part. For example, if the displayed Resource is the third resource within a Resource Set of five Resources, the "X" will be "3" and the "Y" will be "5". The arrows to the right of "X" and "Y" allow the user to access a next Resource with the Resource Set in a single click; this element can be displayed in the same place for each Resource and thus serve as a single point of selection to navigate sequentially, forwards or backwards, through the entire scope of the Resource Set. Upon selection of the Navigation Specific UI Element $\mathbf{1096_1}$ the AUI Controller **1042a** receives an indication of the event. The AUI Controller **1042a** then messages the Application Controller's **1040a** Event X Handler **1100** (Navigate Handler) through the Event Broker **1102** indicating a target Resource that the Browser should display based on the selection of the Navigation Specific UI Element $\mathbf{1096_1}$. Generally, an Event X Handler may be one or more handlers the functions of which include receiving an Event X Message to continue one or more processes initiated by the Event X Message. Generally, an Event X Message is one or more messages published to initiate a sub-process of the RSPP. "X" represents the concept that there are many different Event Handlers and Messages, each supporting a different function. An Event X Handler may be a Navigate Handler. A Navigate Handler may be one or more handlers that receives the Navigate Message (described in detail below) to continue the Navigation Process. There may be more specific kinds of Navigate Handlers that may affect a specific kind of navigation. For example, to affect a navigation from a single Resource to another within the same Resource Set, a Navigate to Resource Message may be published for receipt by a Navigate to Resource Handler; to affect a navigation from a Resource Set to a different Resource Set, a Navigate to Resource Set Message may be published for receipt by a Navigate to Resource Set Handler. The Event Broker **1102** may represent the Browser Application **1032** messaging API. Upon receiving an indication of the message (a Navigate Message), the Application Controller **1040a** changes document URI to that of the target Resource's Resource Page $\mathbf{1016_1}$ intended for display in the target tab. A Navigate Message may be one or more messages 1) published upon selection of a Navigation Specific UI Element and/or initiating the Navigation Process; and 2) containing the information indicating the Resource and/or Resource Set to which the Browser Application should navigate and, if needed, the Rendered View or Rendered Views and/or tab or tabs in

which to affect the navigation. There may be more specific kinds of Navigate Messages that may affect a specific kind of navigation. For example, to affect a navigation from a single Resource to another within the same Resource Set, a Navigate to Resource Message may used; to affect a navigation from a Resource Set to a different Resource Set, a Navigate to Resource Set Message may used. The Application Controller **1040a** retrieves from the Resource Data Set **1026** the Resource Data sufficient to display the intended Resource. The Application Controller **1040a** sends the Dynamic Navigation UI View State and Resource Data Message to the AUI Controller **1042a** through the Event Broker ultimately resulting in the display of the target Resource's Resource Page $\mathbf{1016}_1$ alongside its Browser-bound DNUI $\mathbf{1020a}_1$. The process can begin again with the selection of the Navigation Specific UI Element $\mathbf{1096}_1$.

[0169] Once one or more Resources of a Resource Set have been associated with a Pane of a Pane Layout by virtue of a common Visual Designator, the Browser-bound AUI **1020,** frequently the Browser-bound DNUI **1020a,** may serve as the starting point of the Array Generation Process. As noted above, while the Array Generation Specific UI Element $\mathbf{1098}_1$ shown in this figure may be placed on other Browser-bound AUI, on those other AUIs the element would still use the same system components and methods of communication as shown and described below. Also as noted above, the Array Generation Process may be initiated without the Browser-bound AUI **1020** at all. However, because the Browser-bound AUI **1020** may be used and helps provide a useful visual representation of the first several steps of an Array Generation Process, the Browser-bound AUI **1020** has been included in the figure and description below.

[0170] The Array Generation Specific UI Element $\mathbf{1098}_1$ on the Browser-bound AUI $\mathbf{1020}_1$, to be utilized in an Array Generation Process initiated by Array Generation Event (AGE) triggered upon selection of the Array Generation Specific UI Element $\mathbf{1098}_1$, is displayed on the AUI in order to provide the means by which an AGE may be triggered and an Array Generation Process initiated. As shown, it may be useful for the Array Generation Specific UI Element $\mathbf{1098}_1$ to reflect something about the Array Type of the Array in which its selection would result; as such VD_1, a first Visual Designator, is shown in a box representing a first Pane; VD_i, one or more additional Visual Designators, is shown in a box representing one or more additional Panes. Upon selection of the Array Generation Specific UI Element $\mathbf{1098}_1$ the AUI Controller **1042a** receives an indication of the event. The AUI Controller **1042a** then sends an AGM through the Event Broker **1102** to its target AMC and possibly other components of the Application Controller **1040a**. In FIGs. **22** and **23**, two blocks with

"AMC" are shown: one with AMC XY **1064** and the other with AMC i **1104**. AMC XY **1064** is a first instance of an AMC in the Application Controller and AMC i **1104** is any number of remaining AMCs an Application Controller may contain. AMC XY **1064** may be thought of as the target AMC for the AGM discussed. Each target AMC may listen for one or more unique AGMs prompted by an AGE intended to initiate an Array Generation Process that will generate an Array Type of the target AMC. The AGM conveys the information to the AMC to continue the Array Generation Process. The AGM may contain all, some, or none of the Resource ID and/or Tab Data Attributes for an AMC to carry out its Array generation and management function; these attributes may include the Resource ID and Tab ID of the Resource Page and Tab in which the AGM triggering Array Generation Specific UI Element $\mathbf{1098_1}$ is displayed.

[0171] Because it offers a view focusing on additional elements for the Array Generation Process and Array Responsive Action Process, it may be useful to refer to FIG. **23** for the following two paragraphs. In an example implementation of the messaging processes of FIG. **23** the Event Broker may be used to broker messages between components (such as between the AUI Controller **1042a** and Application Controller **1040a**) even if not expressly described in the process below. Upon receiving an indication of the AGM, the AMC XY **1064** responds, and retrieves and/or recognizes the Resource Data (from the Resource Data Set **1026**), Visual Designators and PCPs. In some variants of the Array Generation Process, the AMC XY may maintain a Tab Data Set **1074** by use of a TDMS, as described herein. To maintain the Tab Data Set **1074**, the AMC XY may listen for Tab and Browser Window Events. The AMC XY can then "match" each Resource to one or more Panes by virtue of the Resource's and Pane's one or more common Visual Designators to display each Resource intended for display in the Array. The Application Controller **1040a** and/or AMC XY **1064** causes each Array Resource to be displayed in a Tab **1014** of a Browser Window **1012**. To do so, the Application Controller **1040a** and/or AMC XY **1064** may cause one or more new Tabs $\mathbf{1014_i}$ and Browser Windows $\mathbf{1012_i}$ to be generated and display an Array Resource in order to fill the intended Array; this may happen in a variety of ways including with the use of a TDMS. Finally, the AMC XY **1064** positions and sizes the Array Browser Window to the Pane with which the Resource is associated by a common Visual Designator. The AMC XY **1064** may affect these actions directly on the Tab and Browser Window as indicated by the directional arrow from Application Controller **1040a** to each Browser Window **1012** and Tab **1014**; alternatively the Application Controller **1040a** may do so indirectly through the Event Broker **1102**. The AMC XY **1064** can detach an Array Tab from a Browser Window if

warranted by the same methods. Ultimately, the Array Generation Process using the system components described may result in the display of a first Resource of a Resource Set in a Tab **1014**$_1$ of a Browser Window **1012**$_1$ positioned over a first Pane by virtue of one or more Visual Designators, VD$_1$, shared between the first Resource and first Pane and the display of some number of other Resources, each of the same Resource Set and in a Tab **1014**$_i$ of a Browser Window **1012**$_i$ positioned over an additional Pane by virtue of one or more Visual Designators, VD$_i$, shared between each additional Resource and each additional Pane.

[0172] Continuing with reference to FIG. **23**, an Array Responsive Action Process may be initiated by the selection of one of many Browser-bound AUI elements. In many cases an Array Responsive Action Process's responsive action will be that of navigation. In those cases an Array Responsive Action Process may be initiated from an element, including the Navigation Specific UI Element **1096**, on either Browser-bound UI shown in FIG. **23**. Regardless of the element, selection of the Browser-bound UI element may trigger an Event X, in this case a Navigation Process, for the Tab in which the element was selected. The Navigation Process for this Tab may be carried through to completion. However, when an Array exists, its AMC XY **1064** may listen for events of different actions, including navigation actions, occurring for its Array Resources. Upon receiving an indication such an action has occurred in one Array Resource, the AMC XY **1064** may respond by affecting one or more of actions in one or more of the other Array Resources, Tabs, and/or Browser Windows. In this example implementation, a Navigation Process initiated in a Browser-bound AUI **1020**$_1$ for the Resource Page **1016**$_1$ may carry through to completion in Tab **1014**$_1$. The same Navigate Message published by the AUI Controller **1042a** received, through the Event Broker **1102** by the Application Controller's Navigate Handler (shown as the Event X Handler **1100**) for the initial Navigation Process may also be received by the AMC XY **1064**, specifically the AMC XY's Navigate AMH (shown as the Event X AMH **1106**) (generally, a Navigate AMH is an Event X AMH responsible for listening for and responding to one or more Navigate Messages). The AMC XY may respond by publishing a Navigate Message for one or more of its Array Resources in an Array Tab **1014**$_i$ in an Array Browser Window **1012**$_i$. This Navigate Message would follow the same course through the Event Broker **1102** to the Navigate Handler (shown as the Event X Handler **1100**) as part of a new Navigation Process. Upon receipt of the Navigate Message, the Navigate Handler would continue the Navigation Process to completion for each of the Array Tabs **1014**$_i$. These figures are provided for the sake of clarity and do not imply that the functional components and their respective functions must exist as a single logical structure or in the locations and

components shown in these diagrams. In other implementations of the Array Responsive Action Process, other processes, including other navigation processes, may used in place of the Navigation Process to affect the first navigation and subsequent responsive navigations.

[0173] FIGs. **24** and **25** show an example of how, with slight modification, the configuration, components, and messaging system shown following the "General" example of system **1000** in FIGs. **22** and **23** may conform to those of system **1001**. The primary difference between the two configurations, components, and messaging systems is the layer necessary to manage one or more Rendered Views **1017** simultaneously displayed within a single Browser Window as shown in FIGs. **24** and **25**. As represented by the single directional arrow from Rendered View **1017** to the Event Broker **1103** the Rendered View **1017** may pass Rendered View Events through Event Broker **1103** to the Application Controller **1041a**. However, the Rendered View Event messages may also be passed from the Rendered View **1017** to the Application Controller **1041a** through the Application UI Controller **1043a** before the Event Broker **1103**. Other communication between each Rendered View **1017**, its associated Resource Page **1016**, and Resource Page **1016**'s associated AUI with the Application Controller **1041a** may go through the Application UI Controller **1043a**. As noted in the description herein, the Application UI Controller **1042** and **1043** may exist in multiple instances. These figures are provided for the sake of clarity and do not imply that the functional components and their respective functions must exist as a single logical structure or in the locations and components shown in these diagrams.

[0174] FIGs. **26** and **27** are diagrams illustrating a "General" example of the messaging processes for variants of the Navigation Process, Array Generation Process, and Array Responsive Action Process that include the use of a Page-bound AUI **1022.** While following the "General" example, as indicated by the AMC XY **1064** shown in each figure, the figures illustrate and label many other components, sub-components, and data elements in a more conceptual way in order to represent (within the confines of a reasonably sized figure) the wide variety of Arrays, Array Types and Behavior, and responsive actions that may be incorporated in the messaging processes described below using system **1000**. The labeling system is mostly same as that described in FIG. **1**. The subscript "1" will represent the first instance of a component, sub-component, or data element; the subscript "i" will represent one or more additional instances of the same. However, because each AMC may fulfill a different function, the concept of an "i" number of AMCs is represented slightly differently. In keeping with the "General" example, AMC XY embodies the first instance of an AMC;

AMC i represents an "i" number of additional AMCs, each of which may be unique and create, manage, and govern the behavior of one or more Arrays of a unique Array Type.

[0175] In this example, the Page-Bound AUI **1022** is shown directly incorporated into the Resource Page **1016** displayed in Browser Window **1012** of Display Device **1010**. The positioning of the Page-Bound AUI **1022** in the top-right corner of the Resource Page **1016** is merely for the sake of example and other implementations, positioning, sizing, configurations, etc. are possible. For example, the Page-Bound AUI **1022** can be made movable, so that it can be moved to any location on the Resource Page **1016**. The process and arrangement of functional components desirable to use the Page-Bound AUI **1022** in the Navigation Process, Array Generation Process, and Array Responsive Action Process are much the same as those desirable to use the Browser-bound AUI **1020** in the Navigation Process, Array Generation Process, and Array Responsive Action Process. However, as shown in the diagram, the AUI Controller is embodied by and inserted directly into the Resource Page **1016** as Content Script Single **1108**. As a result, the Content Script Single **1108** may be inserted into each Resource Page of a Resource Set when the Resource Page is initially rendered.

[0176] The Page-bound AUI may take several forms, including the Dynamic Navigation UI and Resource Formation UI. In this example, two specific elements that may be part of a DNUI, the Navigation Specific UI Element **1096** and the Array Generation Specific UI Element **1098**, are shown in the Page-Bound AUI **1022** and their communication with other components of system **1000** are described in detail. While the UI elements are often part of the DNUI, the method of communication between these or other similar elements in other AUIs and the Application may utilize the same system components and many of the same processes described herein. For this reason and that these other AUIs are not an essential part of the Navigation Process, Array Generation Process, and Array Responsive Action Process described herein, the description only includes the two AUI elements mentioned above in the example Page-Bound AUI **1022** and its inclusion in the messaging processes for the Navigation Process, Array Generation Process, and Array Responsive Action Process.

[0177] Because it offers a simplified view focusing on the elements often part of the Navigation Process, it may be useful to refer to just FIG. **26** for the following paragraph. Once a Resource Page **1016**$_1$ has been recognized as part of a Resource Set, the Page-Bound AUI **1022**$_1$, in the form of the Page-bound DNUI **1022a**$_1$, may serve as both the starting and ending point of the Navigation Process. The start of the process may begin with the explicit representation on the Page-Bound DNUI **1022a**$_1$ of the current Resource Page's **1016**$_1$ place

within the scope and sequence of the Resource Set of which the Resource Page is a part. Navigation Specific UI Elements on the Page-Bound DNUI **1022a**$_1$, such as a directional arrows or buttons indicating the sequence such as "Next" and "Previous", are displayed in order to provide the means with which one or more Resources in the Resource Set can be accessed according to the Resource Set's creator's intended scope and sequence. One possible example of such a Navigation Specific UI Element **1096** is shown in FIG. **26**. In this example the "X" represents the displayed Resource's order within the numbered scope of the Resource Set of which the Resource Set is a part. For example, if the displayed Resource is the third resource within a Resource Set of five Resources, the "X" will be "3" and the "Y" will be "5". The arrows to the right of "X" and "Y" allow the user to access a next Resource with the Resource Set in a single click; this element can be displayed in the same place for each Resource and thus serve as a single point of selection to navigate sequentially, forwards or backwards, through the entire scope of the Resource Set. Upon selection of the Navigation Specific UI Element **1096**$_1$ the Content Script Single **1108**$_1$ receives an indication of the event. The Content Script Single **1108**$_1$ then messages the Background Page's **1050a** Navigate Handler (shown as the Event X Handler **1100**) through the Event Broker **1102** indicating a target Resource to which the Browser should navigate based on the selection of the Navigation Specific UI Element **1096**$_1$. The Event Broker **1102** may represent the Browser Application **1032** messaging API. Upon receiving an indication of the message (Navigate Message), the Background Page **1050a** changes the document URI to that of the target Resource's Resource Page **1016**$_1$ intended for display in the target tab. The Background Page **1050a** retrieves from the Resource Data Set **1026** the Resource Data to display the intended Resource. The Browser Application **1032** injects a Content Script Single **1108**$_1$ into the Resource Page **1016**$_1$. The Background Page **1050a** also sends the Dynamic Navigation UI View State and Resource Data Message to the Content Script Single **1108**$_1$ through the Event Broker ultimately resulting in the display of the target Resource's Resource Page **1016**$_1$ with its Page-Bound DNUI **1022a**$_1$. The process can begin again with the selection of the Navigation Specific UI Element **1096**$_1$.

[0178] Once one or more Resources of a Resource Set have been associated with a Pane of a Pane Layout by virtue of a common Visual Designator, the Page-Bound AUI **1022**, frequently the Page-bound DNUI **1022a**, may serve as the starting point of the Array Generation Process. As noted above, while the Array Generation Specific UI Element **1098**$_1$ shown in this figure may be placed on other Page-bound AUIs, on those other AUIs the element may still use the same system components and methods of communication as shown

and described below. Also as noted above, the Array Generation Process may be initiated without using a Page-Bound AUI **1022**. However, because the Page-Bound AUI **1022** may be used and helps provide a useful visual representation of the first several steps of the Array Generation Process, the Page-Bound AUI **1022** has been included in the figure and description below.

[0179] The Array Generation Specific UI Element $\mathbf{1098_1}$ on the Page-Bound AUI $\mathbf{1022_1}$, to be utilized in an Array Generation Process initiated by Array Generation Event (AGE) triggered upon selection of the Array Generation Specific UI Element $\mathbf{1098_1}$, is displayed on the AUI in order to provide the means by which an AGE can be triggered and an Array Generation Process initiated. As shown, it may be useful for the Array Generation Specific UI Element $\mathbf{1098_1}$ to reflect something about the Array Type of the Array in which its selection would result; as such VD_1, a first Visual Designator, is shown in a box representing a first Pane; VD_i, one or more additional Visual Designators, is shown in a box representing one or more additional Panes. Upon selection of the Array Generation Specific UI Element $\mathbf{1098_1}$ the Content Script Single $\mathbf{1108_1}$ receives an indication of the event. The Content Script Single $\mathbf{1108_1}$ then sends an AGM through the Event Broker **1102** to its target AMC and possibly other components of the Background Page **1050a**. In FIGs. **26** and **27**, two blocks with "AMC" are shown: one with AMC XY **1064** and the other with AMC i. AMC XY is a first instance of an AMC in the Background Page **1050a** and AMC i is any number of remaining AMCs a Background Page **1050a** may contain. AMC XY may be thought of as the target AMC for the AGM discussed. Each target AMC may listen for one or more unique AGMs prompted by an AGE intended to initiate an Array Generation Process that will generate an Array Type of the target AMC. The AGM conveys the information to the AMC to continue the Array Generation Process. The AGM may contain all, some, or none of the Resource ID and/or Tab Data Attributes for the AMC to carry out its Array generation and management function; these attributes include the Resource ID and Tab ID of the Resource Page and Tab in which the AGM triggering Array Generation Specific UI Element $\mathbf{1098_1}$ is displayed.

[0180] Because it offers a view focusing on additional elements for the Array Generation Process and Array Responsive Action Process, it may be useful to refer to FIG. **27** for the following two paragraphs. In an example implementation of the messaging processes of FIG. **27** the Event Broker may be used to broker messages between components (such as between the Content Script Single **1108** and Background Page **1050a**) even if not expressly described in the process below. Upon receiving an indication of the AGM, the AMC XY **1064**

responds, and retrieves and/or recognizes the Resource Data (from the Resource Data Set **1026**), Visual Designators and PCPs. In some variants of the Array Generation Process, the AMC XY may maintain a Tab Data Set **1074** by use of a Tab Data Management System, described herein. To maintain the Tab Data Set **1074**, the AMC XY may listen for Tab and Browser Window Events. The AMC XY **1064** can then "match" each Resource to one or more Panes by virtue of the Resource's and Pane's one or more common Visual Designators to display each Resource intended for display in the Array. The Background Page **1050a** and/or AMC XY **1064** causes each Array Resource to be displayed in a Tab **1014** of a Browser Window **1012**. To do so, the Background Page **1050a** and/or AMC XY **1064** may cause one or more new Tabs $\mathbf{1014}_i$ and Browser Windows $\mathbf{1012}_i$ to be generated and display an Array Resource in order to fill the intended Array. As described herein, this may happen in a variety of ways including with the use of a TDMS. Finally, the AMC XY **1064** positions and sizes the Array Browser Window to the Pane with which the Resource is associated by a common Visual Designator. The AMC XY **1064** may affect these actions directly on the Tab and Browser Window as indicated by the directional arrow from Background Page **1050a** to each Browser Window **1012** and Tab **1014**; alternatively the Background Page **1050a** may do so indirectly through the Event Broker **1102**. The AMC XY **1064** can detach an Array Tab from a Browser Window if warranted by the same method. Ultimately, the Array Generation Process using the system components described may result in the display of a first Resource of a Resource Set in a Tab $\mathbf{1014}_1$ of a Browser Window $\mathbf{1012}_1$ positioned over a first Pane by virtue of one or more Visual Designators, VD_1, shared between the first Resource and first Pane and the display of some number of other Resources, each of the same Resource Set and in a Tab $\mathbf{1014}_i$ of a Browser Window $\mathbf{1012}_i$ positioned over an additional Pane by virtue of one or more Visual Designators, VD_i, shared between each additional Resource and each additional Pane.

[0181] Continuing with reference to FIG. **27**, an Array Responsive Action Process may be initiated by the selection of one of many Page-bound AUI elements. In many cases an Array Responsive Action Process's responsive action will be that of navigation. In those cases an Array Responsive Action Process may be initiated from an element, including the Navigation Specific UI Element **1096**, on either Page-bound AUI shown in FIG. **27**. Regardless of the element, selection of the Page-bound AUI element may trigger an Event X, in this case a Navigation Process, for the Tab in which the element was selected. The Navigation Process for this Tab may be carried through to completion. However, when an Array exists, its AMC XY **1064** may listen for events of different actions, including navigation actions, occurring

for its Array Resources. Upon receiving an indication such an action has occurred in one Array Resource, the AMC XY **1064** may respond by affecting one or more of actions in one or more of the other Array Resources, Tabs, and/or Browser Windows. In this example implementation, a Navigation Process initiated in a Page-bound AUI $\mathbf{1022_1}$ for the Resource Page $\mathbf{1016_1}$ may carry through to completion in Tab $\mathbf{1014_1}$. The same Navigate Message published by the Content Script Single $\mathbf{1108_1}$ and received, through the Event Broker **1102**, by the Background Page's Navigate Handler (shown as the Event X Handler **1100**) for the initial Navigation Process also may be received by the AMC XY **1064**, specifically the AMC XY's Navigate AMH, (shown as the Event X AMH **1106**). The AMC XY may respond by publishing a Navigate Message for one or more of its Array Resources in an Array Tab $\mathbf{1014_i}$ in an Array Browser Window $\mathbf{1012_i}$. This Navigate Message would follow the same course through the Event Broker **1102** to the Navigate Handler (shown as the Event X Handler **1100**) as part of a new Navigation Process. Upon receipt of the Navigate Message, the Navigate Handler would continue the Navigation Process to completion for each of the Array Tabs $\mathbf{1014_i}$. These figures are provided for the sake of clarity and do not imply that the functional components and their respective functions must exist as a single logical structure or in the locations and components shown in these diagrams. In other implementations of the Array Responsive Action Process, other processes, including other navigation processes, may used in place of the Navigation Process to affect the first navigation and subsequent responsive navigations.

[0182] FIGs. **28** and **29** are diagrams illustrating a "General" example of the messaging processes for variants of the Navigation Process, Array Generation Process, and Array Responsive Action Process that include the use of a Page-bound AUI **1024.** While following the "General" example, as indicated by the AMC XY **1064** shown in each figure, the figures illustrate and label many other components, sub-components, and data elements in a more conceptual way in order to represent (within the confines of a reasonably sized figure) the wide variety of Arrays, Array Types and Behavior, and responsive actions that may be incorporated in the messaging processes described below using system **1000**. The labeling system is mostly same as that described in FIG. **1**. The subscript "1" will represent the first instance of a component, sub-component, or data element; the subscript "i" will represent one or more additional instances of the same. However, because each AMC may fulfill a different function, the concept of an "i" number of AMCs is represented slightly differently. In keeping with the "General" example, AMC XY embodies the first instance of an AMC;

AMC i represents an "i" number of additional AMCs, each of which may be unique and create, manage, and govern the behavior of one or more Arrays of a unique Array Type.

[0183] In this example, the Page-bound AUI **1024** is shown directly incorporated into the Resource Page **1016** displayed in Browser Window **1012** of Display Device **1010**. The positioning of the Page-bound AUI **1024** in the top-right corner of the Resource Page **1016** is merely for the sake of example and other implementations, positioning, sizing, configurations, etc. are possible. For example, the Page-bound AUI **1024** can be made movable, so that it can be moved to any location on the Resource Page **1016**. The process and arrangement of functional components desirable to use the Page-bound AUI **1024** in the Navigation Process, Array Generation Process, and Array Responsive Action Process are much the same as those desirable to use the Browser-bound AUI **1020** in the Navigation Process, Array Generation Process, and Array Responsive Action Process. However, as shown in the diagram, the AUI Controller functions are carried out by Content Script Initial **1110**, a content script that has been inserted into Resource Page **1016** and Content Script UI **1112**, a content script that has been encapsulated in an IFrame added by Contents Script Initial **1110** that has been inserted into Resource Page **1016**. As a result, the Content Script UI **1112** and Content Script Initial **1110** may be inserted into each Resource Page of a Resource Set when the Resource Page is initially rendered.

[0184] The Page-bound AUI may take several forms, including the Dynamic Navigation UI and Resource Formation UI. In this example, two specific elements often part of a DNUI, the Navigation Specific UI Element **1096** and the Array Generation Specific UI Element **1098**, are shown in the Page-bound AUI **1024** and their communication with other components of system **1000** are described in detail. While the UI elements are often part of the DNUI, the method of communication between these or other similar elements in other AUIs and the Application may utilize the same system components and many of the same processes described herein. For this reason and that these other AUIs are not an essential part of the Navigation Process, Array Generation Process, and Array Responsive Action Process described herein, the description only includes the two AUI elements mentioned above in the example Page-bound AUI **1024** and its inclusion in the messaging processes for the Navigation Process, Array Generation Process, and Array Responsive Action Process.

[0185] Because it offers a simplified view focusing on the elements for the Navigation Process, it may be useful to refer to just FIG. **28** for the following paragraph. Once a Resource Page **1016**$_1$ has been recognized as part of a Resource Set, the Page-bound AUI **1024**$_1$, in the form of the Page-bound DNUI **1024a**$_1$, may serve as both the starting and

ending point of the Resource Set Navigation Process. The start of the process may begin with the explicit representation on the Page-bound DNUI of the current Resource Page's **1016_1** place within the scope and sequence of the Resource Set of which the Resource Page is a part. Navigation Specific UI Elements on the Page-bound DNUI, such as a directional arrows or buttons indicating the sequence such as "Next" and "Previous", are displayed in order to provide the means with which one or more Resources in the Resource Set can be accessed according to the Resource Set's creator's intended scope and sequence. One possible example of such a Navigation Specific UI Element **1096** is shown in FIG. **28.** In this example the "X" represents the displayed Resource's order within the numbered scope of the Resource Set of which the Resource Set is a part. For example, if the displayed Resource is the third resource within a Resource Set of five Resources, the "X" will be "3" and the "Y" will be "5". The arrows to the right of "X" and "Y" allow the user to access a next Resource with the Resource Set in a single click; this element can be displayed in the same place for each Resource and thus serve as a single point of selection to navigate sequentially, forwards or backwards, through the entire scope of the Resource Set. Upon selection of the Navigation Specific UI Element **1096_1** the Content Script UI **1112_1** receives an indication of the event. The Content Script UI **1112_1** then messages the Background Page's **1050b** Navigate Handler (shown as the Event X Handler **1100**) through the Event Broker **1102** indicating a target Resource to which the Browser should navigate based on the selection of the Navigation Specific UI Element **1096_1**. The Event Broker **1102** may represent the Browser Application **1032** messaging API. Upon receiving the indication of the message (a Navigate Message), the Background Page **1050b** changes the document URI to that of the target Resource's Resource Page intended for display in the target tab. The Background Page **1050b** retrieves from the Resource Data Set **1026** the Resource Data sufficient to display the intended Resource. The Browser Application **1032** injects a Content Script Initial **1110_1** into the Resource Page **1016_1**. This action results in the addition of a Content Script UI **1112_1** encapsulated in an IFrame **1114_1** in the Resource Page **1016_1**. The Background Page **1050b** publishes the Dynamic Navigation UI View State and Resource Data Message. The Content Script Initial **1110_1** and Content Script UI **1112_1** receive the message, ultimately resulting in the display of the target Resource's Resource Page **1016_1** with its Page-bound DNUI **$1024a_1$**. The process can begin again with the selection of the Navigation Specific UI Element **1096_1**.

[0186] Once one or more Resources of a Resource Set have been associated with a Pane of a Pane Layout by virtue of a common Visual Designator, the Page-bound AUI **1024**, frequently the Page-bound DNUI **1024a,** may serve as both the starting point of the Array Generation

Process. As noted above, while the Array Generation Specific UI Element **1098**$_1$ shown in this figure may be placed on other Page-bound AUIs **1024**, on those other AUIs the element may still use the same system components and methods of communication as shown and described below. Also as noted above, the Array Generation Process may be initiated without using a Page-bound AUI **1024**. However, because the Page-bound AUI **1024** may be used and helps provide a useful visual representation of the first several steps of the Array Generation Process, the Page-bound AUI **1024** has been included in the figure and description below.

[0187] The Array Generation Specific UI Element **1098**$_1$ on the Page-bound AUI **1024**$_1$, to be utilized in an Array Generation Process initiated by Array Generation Event (AGE) triggered upon selection of the Array Generation Specific UI Element **1098**$_1$, is displayed on the AUI in order to provide the means by which an AGE can be triggered and an Array Generation Process initiated. As shown, it may be useful for the Array Generation Specific UI Element **1098**$_1$ to reflect something about the Array Type of the Array in which its selection would result; as such VD_1, a first Visual Designator, is shown in a box representing a first Pane; VD_i, one or more additional Visual Designators, is shown in a box representing one or more additional Panes. Upon selection of the Array Generation Specific UI Element **1098**$_1$ the Content Script UI **1112**$_1$ receives an indication of the event. The Content Script UI **1112** then sends an AGM through the Event Broker **1102** to its target AMC and possibly other components of the Background Page **1050b**. In FIGs. **28** and **29**, two blocks with "AMC" are shown: one with AMC XY **1064** and the other with AMC i. AMC XY **1064** is a first instance of an AMC in the Background Page **1050b** and AMC i is any number of remaining AMCs a Background Page **1050b** may contain. AMC XY **1064** may be thought of as the target AMC for the AGM discussed. Each target AMC may listen for one or more unique AGMs prompted by an AGE intended to initiate an Array Generation Process that will generate an Array Type of the target AMC. The AGM conveys the information to the AMC to continue the Array Generation Process. The AGM may contain all, some, or none of the Resource ID and/or Tab Data Attributes sufficient for the AMC to carry out its Array generation and management function; these attributes include the Resource ID and Tab ID of the Resource Page and Tab in which the AGM triggering Array Generation Specific UI Element **1098**$_1$ is displayed.

[0188] Because it offers a view focusing on additional elements for the Array Generation Process and Array Responsive Action Process, it may be useful to refer to FIG. **29** for the following two paragraphs. In an example implementation of the messaging processes of FIG.

29 the Event Broker may be used to broker messages between components (such as between the Content Script Initial **1110**, Content Script UI **1112** and Background Page **1050b**) even if not expressly described in the process below. Upon receiving an indication of the AGM, the AMC XY **1064** responds, and retrieves and/or recognizes the Resource Data (from the Resource Data Set **1026**), Visual Designators and PCPs. In some variants of the Array Generation Process, the AMC XY may maintain a Tab Data Set **1074** by use of a TDMS, described in detail herein. To maintain the Tab Data Set **1074**, the AMC XY may listen for Tab and Browser Window Events. The AMC XY **1064** can then "match" each Resource to one or more Panes by virtue of the Resource's and Pane's one or more common Visual Designators to display each Resource intended for display in the Array. The Background Page **1050b** and/or AMC XY **1064** causes each Array Resource to be displayed in a Tab **1014** of a Browser Window **1012**. To do so, the Background Page **1050b** and/or AMC XY **1064** may cause one or more new Tabs $\mathbf{1014}_i$ and Browser Windows $\mathbf{1012}_i$ to be generated and display an Array Resource in order to fill the intended Array. As described herein, this may happen in a variety of ways including with the use of a TDMS. Finally, the AMC XY **1064** positions and sizes the Array Browser Window to the Pane with which the Resource is associated by a common Visual Designator. The AMC XY **1064** may affect these actions directly on the Tab and Browser Window as indicated by the directional arrow from Background Page **1050b** to each Browser Window **1012** and Tab **1014**; alternatively the Background Page **1050b** may do so indirectly through the Event Broker **1102**. The AMC XY **1064** can detach an Array Tab from a Browser Window if warranted by the same method. Ultimately, the Array Generation Process using the system components described may result in the display of a first Resource of a Resource Set in a Tab $\mathbf{1014}_1$ of a Browser Window $\mathbf{1012}_1$ positioned over a first Pane by virtue of one or more Visual Designators, VD_1, shared between the first Resource and first Pane and the display of some number of other Resources, each of the same Resource Set and in a Tab $\mathbf{1014}_i$ of a Browser Window $\mathbf{1012}_i$ positioned over an additional Pane by virtue of one or more Visual Designators, VD_i, shared between each additional Resource and each additional Pane.

[0189] Continuing with reference to FIG. 29, an Array Responsive Action Process may be initiated by the selection of one of many Page-bound AUI elements. In many cases an Array Responsive Action Process's responsive action will be that of navigation. In those cases an Array Responsive Action Process may be initiated from an element, including the Navigation Specific UI Element $\mathbf{1096}_1$, on either Page-bound AUI shown in FIG. 29. Regardless of the element, selection of the Page-bound AUI element may trigger an Event X, in this case a

Navigation Process, for the Tab in which the element was selected. The Navigation Process for this Tab may be carried through to completion. However, when an Array exists, its AMC XY **1064** may listen for events of different actions, including navigation actions, occurring for its Array Resources. Upon receiving an indication such an action has occurred in one Array Resource, the AMC XY **1064** may respond by affecting one or more of actions in one or more of the other Array Resources, Tabs, and/or Browser Windows. In this example implementation, a Navigation Process initiated in Page-bound AUI **1024**$_1$ for the Resource Page **1016**$_1$ may carry through to completion in Tab **1014**$_1$. The same Navigate Message published by the Content Script UI **1112** received, through the Event Broker **1102**, by the Background Page's Navigate Handler (shown as the Event X Handler **1100**) for the initial Navigation Process may also be received by the AMC XY **1064**, specifically the AMC XY's Navigate AMH, (shown as the Event X AMH **1106**). The AMC XY may respond by publishing a Navigate Message for one or more of its Array Resources in an Array Tab **1014**$_i$ in an Array Browser Window **1012**$_i$. This Navigate Message would follow the same course through the Event Broker **1102** to the Navigate Handler (shown as the Event X Handler **1100**) as part of a new Navigation Process. Upon receipt of the Navigate Message, the Navigate Handler would continue the Navigation Process to completion for each of the Array Tabs **1014**$_i$. These figures are provided for the sake of clarity and do not imply that the functional components and their respective functions must exist as a single logical structure or in the locations and components shown in these diagrams. In other implementations of the Array Responsive Action Process, other processes, including other navigation processes, may used in place of the Navigation Process to affect the first navigation and subsequent responsive navigations.

[0190] FIG. **30** is a diagram illustrating a detailed "General" example implementation of a Visual Designation Process step, associating a Visual Designator with a Resource of a Resource Set, utilizing a Page-bound Resource Formation UI (RFUI) **1024b** (generally, a RFUI is an AUI the functions of which include the following: 1) the means to create a Resource concept defined by a Resource title; 2) the means to associate one or more URIs to the constituent Pages or Page Selections of the Resource; and 3) the means to associate to a Resource elements of Resource Data in the form of organizational context that may include the Resource's Group, Sub-Group, and one or more Visual Designators) of the system **1000** Extension Files **1048b** as discussed previously. Although (as implied in the Visual Designation Process description for FIG. **42**) the use of the Page-bound RFUI **1024b** is not necessary to accomplish the primary aspect (associating a Resource with a Visual Designator)

of the step represented in this figure, the Page-bound RFUI **1024b** may be used to do so and is a useful visual aid for the sake of clarity because of its explicit representation of data fields and example values used in the process. In addition, the description of this step implies that another Visual Designation Process step, associating a Visual Designator with a Pane, has already or will take place. While the association between a Visual Designator and a Pane is important to the Visual Designation Process, as mentioned in the description of the summary process, there are a number of ways by which a Pane can be associated with a Visual Designator, including by inclusion in the application code base prior to Resource Formation. For this reason, the process of associating a Visual Designator and a Pane has not been included herein as a separate figure.

[0191] As shown in this "General" example, the Page-bound AUI **1024** is a Page-bound RFUI **1024b** which displays the fields and entries for Resource formation involving Page 1 **1116** of Provider 1 **1118**. For example the following "field – entry" pairs are shown: "Resource title – Resource Title", "Resource URI(s) – URI 5", "Group – Group 1" (with which to associate the Resource once formed), "tags – Tag 1A" (with which to associate the Resource (once formed) with one or more Sub-Groups), and "Visual Designator - Visual Designator X" (the entry for which can be used to link the Resource (once formed) to a Pane associated with the same Visual Designator). The "Save" button has been selected, saving the entries as Resource Data for what, upon the saving action, will be a newly formed Resource.

[0192] The Tab "3" and Browser Window "1" represent the tab and browser associated with Resource 3 (the Resource being saved) as shown in FIGs. **10** and **12-16** that follow the "General" example. The Navigation Arrows **1120** represent standard browser navigation arrows. The Refresh Icon **1122** allows the user to refresh a rendered webpage. The Address Bar **1124** allows the user to enter and view the URI of any webpage or Resource Page displayed. The Extension Icon **1058** represents the extension icon of the Extension Files **1048b.**

[0193] The Page 1 **1116** represents any webpage available on a computer network in its original browser rendering. Provider 1 **1118** refers to the provider who has made the Page 1 **1116** available on a computer network. The "Content/function" elements represent the fact that a Page 1 **1116** may contain content or functional elements of any size and located at any place within the Page 1 **1116** as rendered in the Browser Window.

[0194] FIG. **31** is a diagram illustrating a detailed "General" example implementation of the Page-bound DNUI **1024a** utilizing the system **1000** Extension Files **1048b** as discussed previously. Once a Resource Page has been recognized as part of a Resource Set, the Page-

bound DNUI **1024a** may become both the starting and ending point of the Navigation Process. As shown in this example, the Page-bound DNUI **1024a** displays some of the organizational and informational context of the Page 1 **1116** with which it is displayed as a Resource; this context is Resource Data. For example "Resource 3" is the Resource title; "URI 5" is the URI of the Resource Page in view; "Group 1" refers to the Group of which the Resource is a part; "Tag 1A" is one of one or more tags with which the Resource has been tagged and defines a Sub-Group of which the Resource is a part; "Visual Designator X" is the Visual Designator with which the Resource has been associated; the container with "3 of 5" and a set of "up" "down" arrows is the Navigation Specific UI Element **1096**.

[0195] The Tab "3" and Browser Window "1" represent the tab and browser associated with Resource 3 as shown in FIGs. **10** and **12-16**. The Page 1 **1116** represents any webpage available on a computer network in its original browser rendering. Provider 1 **1118** refers to the provider who has made the Page 1 **1116** available on a computer network.

[0196] FIG. **32** is a diagram illustrating a detailed "General" example implementation of the Page-bound DNUI **1024a** utilizing the system **1000** Extension Files **1048b** as discussed previously. In this figure, the "down" arrow of the Navigation Specific UI Element **1096** has been selected and thus an example of the Navigation Process, navigating from the third Resource to the fourth Resource within the Resource Set defined by the Group 1, Sub-Group Tag-1A, and Visual Designator X, has begun.

[0197] The Tab "3" and Browser Window "1" represent the tab and browser associated with Resource 3 as shown in FIGs. **10** and **12-16**. The Page 1 **1116** represents any webpage available on a computer network in its original browser rendering. Provider 1 **1118** refers to the provider who has made the Page 1 **1116** available on a computer network.

[0198] FIG. **33** is a diagram illustrating a detailed "General" example implementation of the Page-bound DNUI **1024a** utilizing the system **1000** Extension Files **1048b** as discussed previously. FIG. **33** shows the example of the Navigation Process, navigating from the third Resource to the fourth Resource of the Resource Set defined by Group 1, Sub-Group Tag-1A, and Visual Designator X has completed.

[0199] As shown, Page-bound DNUI **1024a** now displays the Resource Data of the new Resource Page 2 **1126** with which it is displayed as Resource 4 of the Resource Set of "Group 1". As shown, "Resource 4" is the Resource title; "URI 6" is the URI of the Resource Page in view; "Group 1" refers to the Group of which the Resource is a part; "Tag 1A" is one of one or more tags with which the Resource has been tagged and defines a Sub-Group of which the Resource is a part; "Visual Designator X" is the Visual Designator with which the

Resource has been associated; the container with "4 of 5" and a set of "up" "down" arrows is the Navigation Specific UI Element **1096**;

[0200] The Tab "3" and Browser Window "1" represent the tab and browser associated with Resource 4 as shown in FIGs. **10** and **12-16**. The Resource Page 2 **1126** represents any webpage available on a computer network in its original browser rendering. Provider 2 **1128** refers to the provider who has made the Resource Page 2 **1126** available on a computer network. The "Content/function" elements represent the fact that a Resource Page 2 **1126** may contain content or functional elements of any size and located at any place within the Resource Page 2 **1126** as rendered in the Browser Window "1".

[0201] FIG. **34** is a diagram illustrating a "General" example implementation of another Visual Designation Process step, associating a Visual Designator with a Resource of a Resource Set, utilizing a Page-bound RFUI **1024b** of the system **1000** Extension Files **1048b** as discussed previously. Although (as implied in the Visual Designation Process summary description for FIG. **42**) using the Page-bound RFUI **1024b** is not necessary to accomplish the primary aspect (associating a Resource with a Visual Designator) of the step represented in this figure, the Page-bound RFUI **1024b** may be used to do so.

[0202] As shown in this example, the Page-bound AUI **1024** is a Page-bound RFUI **1024b** which displays the fields and entries for Resource formation involving Page 1 **1130** of Provider 3 **1132**. For example the following "field – entry" pairs are shown: "Resource title – Resource Title"; "Resource URI(s) – URI 7"; "Group – Group 1" (with which to associate the Resource once formed); "tags – ---" (with which to associate the Resource (once formed) with one or more Sub-Groups); "Visual Designator - Visual Designator Y" (the entry for which can be used to link the Resource (once formed) to a Pane associated with the same Visual Designator); and "Resource Association – Resource 3" (Resource 3 is associated with Visual Designator X). The "Save" button has been selected, saving the entries as Resource Data for what, upon the saving action, will be a newly formed Resource.

[0203] The Tab "15" and Browser Window "6" represent the tab and browser window associated with Resource 5 (the Resource being saved) as shown in FIGs. **10** and **12-16**. The Page 1 **1130** represents any webpage available on a computer network in its original browser rendering. Provider 3 **1132** refers to the provider who has made the Page 1 **1130** available on a computer network.

[0204] FIG. **35** is a diagram illustrating a detailed "General" example implementation of an Array Generation Process step, initiation of an Array Generation Process by an Array Generation Event (AGE) resulting from the selection of an Array Generation Specific UI

Element, utilizing a Page-bound DNUI **1024a** of the system **1000** Extension Files **1048b**. Although the use of the Page-bound DNUI **1024a** is not necessary to trigger an AGE, the Page-bound DNUI **1024a** may be used to do so. This "General" example assumes the user has navigated back from Resource 4, as shown in FIG. **33**, to Resource 3.

[0205] As shown, a Page-bound DNUI **1024a** displays the Resource Data of the Resource Page 1 **1116** with which it is displayed as Resource 3 of the Resource Set of Group 1 and Sub-Group Tag 1A. Resource 3 is the Resource title; URI 5 is the URI of the Resource Page in view; Group 1 refers to the Group of which the Resource is a part; Tag 1A is one of one or more tags with which the Resource has been tagged and defines a Sub-Group of which the Resource is a part; Visual Designator X is the Visual Designator with which the Resource has been associated; the container with "3 of 5" and a set of "up" "down" arrows is the Navigation Specific UI Element **1096**; the "XY" button in the middle of the DNUI is an Array Generation Specific UI Element **1098** that may be selected to initiate an Array Generation Process, leading directly or indirectly to the publication of an AGM listened for by AMC XY. The following FIG. **36** shows the Array Generation Process initiated in this figure having generated the intended Array, sizing and positioning a Browser Window containing the Tab displaying a Resource Page of Resource 3 over the left half of the Client Area of the Display Device and a Browser Window containing the Tab displaying Resource 5 over the right half of the Client Area of the Display Device.

[0206] The Tab "3" and Browser Window "1" represent the tab and browser associated with Resource 3 as shown in FIGs. **10** and **12-16**.

[0207] The Resource Page 1 **1116** represents any webpage available on a computer network in its original browser rendering. Provider 1 **1118** refers to the provider who has made the Resource Page 1 **1116** available on a computer network.

[0208] FIG. **36** is a diagram illustrating a detailed "General" example of the result of an Array Generation Process having 1) created an Array of two Resources, each displayed within a Tab **1014** of a Browser Window **1012** that has been sized and positioned to a Pane Layout's Pane associated with the same Visual Designator as the Resource displayed in the Browser Window's **1012** Tab **1014**; and 2) utilized, among other elements of the system **1000**, an AMC XY **1064**, Visual Designator X and Y, Pane Layout 1, 2 defined by PCPs, a Resource 3 of a Resource Set associated with Visual Designator X, and a Resource 5 of a Resource Set associated with both the latter Resource 3 and Visual Designator Y.

[0209] As shown, Browser Window "1" is sized and positioned to the left half of the Client Area **1030** of the Display Device **1010** corresponding to the Pane 1 that is also associated

with Visual Designator X because Browser Window "1" contains Tab "3" that displays Resource 3 of Group 1 and Sub-Group Tag 1A associated with the Visual Designator X. Browser Window "6" is sized and positioned to the right half of the Client Area **1030** of the Display Device **1010** corresponding to the Pane 2 that is also associated with Visual Designator Y because Browser Window "6" contains Tab "15" that displays Resource 5 of Group 1 and Sub-Group Tag 1A that is associated with both Resource 3 and the Visual Designator Y.

[0210] As mentioned in the previous FIG. **35** describing the same "General" example, the Array Generation Process resulting in this Array was initiated by selection of the Array Generation Specific UI Element **1098** leading to the publication of an AGM. This AGM may contain the Tab Data Attributes sufficient to inform its targeted AMC of the Resources to be displayed in the Array. For example, the AGM may contain just the Tab ID of the Tab from which the AGM was generated and, if there is more than one AMC in the system, the targeted AMC ID; the targeted AMC can receive this message and use the Tab ID to retrieve the Tab Data Attributes from the Tab Data Set **1074a** of FIGs. **12-16**. As described in FIG. **13**, the AMC XY **1064** may receive the Tab ID of the Tab from which the AGM was generated and use it to retrieve the Resource ID of that tab from the Tab Data Set **1074a**. Because the Array to be generated involves two Resources of Group 1 and Sub-Group Tag 1A, one associated with the other (that associated with Visual Designator Y associated with that associated with Visual Designator X), the AMC XY **1064** may use the Resource ID retrieved for the AGM initiating tab as the basis for querying the Resource Data Set to retrieve the Resource ID and Visual Designator of its associated Resource. In this example, an AGM is generated from the Array Generation Specific UI Element **1098** displayed in the DNUI of Resource 3 displayed in Tab "3"; the AGM contains Tab ID "3" as shown in FIGs. **12-16**; Tab ID "3" is used to retrieve Resource 3's Resource ID 3; Resource ID 3 is used as the basis by the AMC XY **1064** for querying the Resource Data Set to retrieve Resource 3's related Resource's Tab Data Attributes sufficient for completion of the Array Generation Process; Resource 3's related Resource's Tab Data Attributes are Resource ID 5 and Visual Designator Y.

[0211] At a point before the AMC XY **1064** sizes and positions the Browser Windows of the Array, the AMC XY will ensure it has access to the most up-to-date PCPs defining the Panes of the Pane Layout underlying the Array the AMC XY governs. Because there are a number of ways by which the AMC XY **1064** can access the PCPs and their associated Visual

Designators, this example will assume that step has completed and the AMC XY's Pane Layout's PCPs are up-to-date.

[0212] As described in FIG. **13**, upon retrieving the Tab Data Attributes for Resource 5 the AMC XY **1064** may query the Tab Data Set **1074a** to determine whether a TNAT (either a Non-Array Tab exists displaying Resource ID 5 or www.google.com) exists that it can use as the second tab of its Array to avoid needlessly generating a new tab. In this example, such a query identifies Tab "15" as a TNAT and returns that information to the AMC XY **1064**. AMC XY then can affect the process to change Tab "15"'s displayed URI to that of a URI of Resource 5 and incorporate Tab "15" into the Array containing Tab "3", ultimately writing to Tab "15"'s Tab Data Attributes the AMC XY's ID, AMC ID XY. In addition, in order to differentiate the Array containing Tabs "3" and "15" from another AMC XY Array (such as that containing Tabs "5" and "8" as shown in FIGs. **12-16**), the AMC XY **1064** will also write to Tab "3" that it is related to Tab "15" and to Tab "15" that it is related to Tab "3".

[0213] Each Tab, in a different Browser Window, now displays a Resource intended for display. At a point before the AMC XY **1064** sizes and positions the Browser Windows of the Array, the AMC XY may match each Resource intended for display in the Array to a Pane of the AMC's Pane Layout by virtue of the Resource and Pane's common Visual Designator. There are many ways by which this step can take place. This example assumes the matching happens by the AMC XY **1064** matching the Resource ID and Visual Designator of each Resource written in the Tab Data Set **1074a** to the Pane's PCPs associated with the same Visual Designator and to which the AMC XY **1064** has access.

[0214] Once Resources and Panes have been "matched" and at least one Resource to be displayed in the Array has been displayed in a Tab in a unique Browser Window, the AMC XY **1064** can use the PCPs to position and size the Browser Window displaying the Tab displaying the Resource with which the PCP's Pane share a common Visual Designator. In this example, Browser Window "1" displaying Tab "3" displaying Resource 3 gets sized to the left half of the Client Area **1030** of the Display Device **1010** using the PCPs of Pane 1 that have been associated with their common Visual Designator X. The Browser Window "6" displaying Tab "15" displaying Resource 5 gets sized to the right half of the Client Area **1030** of the Display Device **1010** using the PCPs of Pane 2 that have been associated with their common Visual Designator Y.

[0215] Each Browser Window and Tab represents any conventional browser window and tab. The Page 1 **1116** represents any webpage available on a computer network in its original browser rendering. Provider 1 **1118** refers to the provider who has made the Page 1 **1116**

available on a computer network. The Page 1 **1130** represents any webpage available on a computer network in its original browser rendering. Provider 3 **1132** refers to the provider who has made the Page 1 **1130** available on a computer network.

[0216] As shown, the Navigation Specific UI Element **1096** of Resource 3's Page-Bound DNUI **1024a** has been selected in this figure. The next figure, FIG. **37**, discusses and shows the result of this action that initiates an Array Responsive Action Process.

[0217] FIG. **37** is a diagram illustrating a detailed "General" example of an Array Responsive Action Process (initiated in the previous figure, FIG. **36**) having affected a Navigation Process in both Browser Window "1"'s Tab "3" and Browser Window "6"'s Tab "15" by the single selection action on a Navigation Specific UI Element in Browser Window "1"'s Tab "3"'s Resource 3's Page-Bound DNUI **1024a**.

[0218] As shown, this figure assumes that some time after the Array Generation Process has been completed for Tab "3" and "15", an Array Responsive Action Process is initiated for the Array by affecting a navigation in Tab "3" from a URI/Resource Page of Resource ID 3 to a URI/Resource Page of Resource ID 4.

[0219] Because, in this example, the Resources in the Array associated with VD Y are associated with a specific Resource in the Array associated with VD X, the navigation from a URI/Resource Page of Resource 3 to that of a URI/Resource Page of Resource 4 affects a navigation in Tab "15" from the URI/Resource Page of Resource 5 which is associated specifically to Resource 3 to that of a URI/Resource Page of Resource 6 which is associated specifically to Resource 4. Doing so allows the relationship between linked Resources within the Group 1 and Sub-Group Tag 1A to remain visually consistent as the user moves through Resources of Group 1 and Sub-Group Tag 1A associated with the same Visual Designator. In other words, within Group 1 and Sub-Group Tag 1A, Resources associated with VD Y that are associated with a specific Resource associated with VD X will only be displayed in the right half of the Client Area **1030** of the Display Device **1010** when the specific Resource associated with VD X with which they are associated is displayed in the left half of the Client Area **1030** of the Display Device **1010**.

[0220] Maintaining the latter visual relationship constitutes a form of Array behavior and may be in part managed by an AMH of the AMC XY **1064**, Navigate AMH, constructed for that responsive navigation within the Array. This example assumes the selection of Resource 3's Page-Bound DNUI's **1024a** Navigation Specific UI Element **1096** displayed in Tab "3" initiates a Navigation Process in Tab "3" by the publication of a Navigate Message, indicating a Navigation Process has started and containing information indicating the

Resource and/or Resource Set (Resource 4 of Group 1 and Sub-Group Tag 1A) to which the Browser Application **1032** should navigate and the tab or tabs (Tab "3" in this example) in which to affect the navigation. To affect the Navigation Process a Navigate Handler of the Background Page **1050b** receives this message. Once received by the Navigate Handler (an Event X Handler **1100**), the Navigation Process may continue to completion for Tab "3". To affect an Array Responsive Action Process connected with this navigation, the Navigate AMH (an Event X AMH **1106**) of the AMC XY **1064** also listens for and receives the Navigate Message. Upon receiving the Navigate Message stemming from selection of Navigation Specific UI Element **1096** of the Resource 3 displayed in Tab "3", the Navigate AMH (an Event X AMH **1106**) of AMC XY **1064** publishes a second Navigate Message for receipt by the same Navigate Handler (an Event X Handler **1100**) utilized in the Navigation Process for Tab "3". However, the second Navigate Message contains information indicating the Resource and/or Resource Set (Resource 6 of Group 1 and Sub-Group Tag 1A) to which the Browser Application **1032** should affect a navigation in Tab "15"; the Navigate AMH (an Event X AMH **1106**) may understand that the Navigate Message should affect Tab "15" by virtue of the Tab Data Attributes available in the Tab Data indicating the association of Tab "15" to Resource 5. From publication of this second Navigate Message by the Navigate AMH (an Event X AMH **1106**) of AMC XY **1064**, the second navigation associated with this message continues to completion as if initiated from Tab "15". As the events occur that generate data elements constituting the Tab Data Attributes for the Tab Data Attribute Sets for Tab "3" and Tab "15", each is written to the Tab Data, updating the Tab Data to reflect the current state of each Tab, its displayed Resource, and the relationship of both to the Array of which they are a part.

[0221] The Page 2 **1126** represents any webpage available on a computer network in its original browser rendering. Provider 2 **1128** refers to the provider who has made the Page 2 **1126** available on a computer network. The Page 1 **1134** represents any webpage available on a computer network in its original browser rendering. Provider 3 **1136** refers to the provider who has made the Page 1 **1134** available on a computer network.

[0222] The example above illustrates just a single instance of how the Array Responsive Action Process can be implemented in an Array. The Array Responsive Action Process may be implemented to affect many responsive actions other than that of navigation including keyword search and highlighting, deletion, Application UI opening and closing, and Array Tab open and closing.

[0223] FIG. **38** is a diagram illustrating an "Education" example of the initiation of an Array Generation Process. A chapter of an eTextbook on Roman Engineering, is displayed with a DNUI. In the DNUI there is a user interface element, an Array Generation Specific UI Element **1098a,** that when selected will initiate an Array Generation Process. For this diagram, the Array Generation Specific UI Element **1098a** has been selected. The Array Generation Specific UI Element **1098a** displays "FC" to indicate the generated Array will display a Resource associated with Visual Designator Focus on the left and a Resource associated with the Visual Designator Context on the right; in this diagram a Resource associated with Context also is associated with a particular Resource associated with Focus. The webpage in view, a chapter on Roman Engineering provided by an eTextbook Provider, has been associated with the Visual Designator Focus; upon completion of the Array Generation Process this Resource will be positioned on the left half of the display.

[0224] FIG. **39** is a diagram that shows the Array Generation Process initiated in FIG. **38** having completed. The Array Generation Process has created a two-window Array of Resources with the page of an eTextbook on Roman Engineering that has been associated with the Visual Designator Focus positioned on the left half of the display and a page showing a map view of the Colosseum that has been associated with both the eTextbook page on Roman Engineering and the Visual Designator Context positioned on the right half of the display. The Navigation Specific UI Element **1096** has been selected, specifically in this case a down arrow, initiating an Array Responsive Action Process which will cause 1) a navigation from the third of five to the fourth of five Resources associated with Focus and of the Group Education and sub-Group Ancient Rome, in this case a navigation from the eTextbook page on Roman Engineering to an educational video on the Roman Forum; and 2) a second navigation from a Context associated with the third of five Resources associated with Focus and of the Group Education and sub-Group Ancient Rome to a Context associated with the fourth of five Resources associated with Focus and of the Group Education and sub-Group Ancient Rome, in this case a navigation from the page showing a map view of the Colosseum to a page showing a map view of the Roman Forum.

[0225] FIG. **40** shows the end result of this Array Responsive Action Process, the new Focus Resource is in view and aligned with its associated Context Resource.

[0226] FIGs. **41A** and **41B** are flowcharts illustrating example operations (**41002** – **41028**) of the system **1000** of FIG. **1** executing a Navigation Process, enablement of the repetitive selection of the same Navigation Specific UI Element in the Dynamic Navigation User

Interface (DNUI) to result in the display of Resources in a Resource Set according to the Resource Set's creator's intended scope and sequence.

[0227] In the example of FIGs. **41A** and **41B**, in a first instance, the Application Controller detects a page loaded into a tab is a Resource of a Resource Set (**41002**). The Application Controller retrieves the loaded Resource's Resource Data (**41004**). The Application Controller builds a DNUI View State and Resource Data Message for that Resource (**41006**). The Application Controller publishes the DNUI View State and Resource Data Message (**41008**). An AUI Controller receives the DNUI View State and Resource Data Message (**41010**). An AUI Controller executes code resulting in the display of a DNUI including Navigation Specific UI Element in or alongside the loaded Resource Page (**41012**). Upon selection of the displayed Navigation Specific UI Element the AUI Controller publishes a Navigate Message (**41014**). The Application Controller receives the Navigate Message (**41016**). The Application Controller retrieves the Resource Data of a Resource intended as a Resource to which the Browser Application will navigate (**41018**). The Application Controller changes appropriate tab's Document URI to that of a Resource intended as the Resource to which the Browser Application will navigate (**41020**). The Application Controller builds a corresponding DNUI View State and Resource Data Message (**41022**). The Application Controller publishes the DNUI View State and Resource Data Message (**41024**). An AUI Controller receives the DNUI View State and Resource Data Message (**41026**). The AUI Controller executes code resulting in display of a Resource's DNUI including its Navigation Specific UI Element according to the Resource Set's creator's intended scope and sequence in the appropriate tab (**41028**).

[0228] FIG. **42** is a flowchart illustrating example operations (**42002** – **42008**) of a Visual Designation Process. These operations may be accomplished using the Application Controller of Browser Application **1032/1033** or an application acting at a lower, operational system level that may distinguish between and utilize Resources of multiple applications on Local Computing Device **1002**.

[0229] In the example of FIG. **42**, in a first instance, one or more Visual Designators is selected or created and made available for use by the Application Controller (**42002**). A Pane Layout of one or more Panes defined by Pane Configuration Parameters is created and made available for use by the Application Controller (**42004**). Each Pane is associated with the one or more Visual Designators, the association of which is made available for use by the Application Controller (**42006**). One or more Resources of a Resource Set is associated with the same one or more Visual Designators as one or more Panes; the association of which is

made available for use by the Application Controller (**42008**). In another embodiment of the Visual Designation Process, the Visual Designators may be applied directly to the viewing component of "(42008)" in which the Resource is displayed instead of the Resource itself. For example, the Visual Designator may be applied to a Tab displaying a webpage instead of the webpage and/or the URI of the webpage itself.

[0230] It is important to note that the RSPP includes the ability to share any Resource Set and associated positional data defining where the digital resource viewing components displaying the Resources should be positioned on the screen or within another viewing component with any number of users.

[0231] For example, a user could share any collection of webpages and/or URIs and associated positional data defining where the browser windows displaying the webpages should be positioned on the screen or Rendered Views displaying the webpages should be positioned within a Browser Window with any number of users. The RSPP enables users to share such information with any number of traditional sharing processes, an example of which would be 1) storing the webpages and/or URIs and their positional display data (whether directly associated to the webpages and/or URIs or indirectly associated through the use of Visual Designator common to both the webpages and/or URIs and the positional data for the webpages and/or URIs) and/or Resource Data saved by a first user on a Remote Server; 2) copying the latter webpages and/or URIs and their associated positional data and/or Resource Data and storing the data as a separate, second data set on a Remote Server; 3) alerting one or more users that a set of webpages and/or URIs and their positional display data and/or Resource Data has been shared with them; 4) allowing the one or more other users to access the second, shared data set and display the webpages and/or URIs' associated webpages and/or Resource Data of the second, shared data set according to the positional display data associated with the webpages and/or URIs and/or Resources in Array. Sharing presentations is an aspect of the RSPP.

[0232] FIG. **43** illustrates an embodiment of a process for generating a visual array of digital resources. Such a visual array may beneficially enable a viewer to view multiple related resources concurrently with the resources organized into different viewing components (e.g., a browser window, tab, or view) on the screen that are automatically positioned in a manner convenient for viewing. Furthermore, viewing components displaying resources may be automatically positioned (and optionally re-sized) based on a pre-assigned visual designation of the resources with designators such as Focus or Context. Visual designation thus enables information about a resource to be conveyed by the position of the resource on the screen.

For example, an array may be generated that automatically positions a Focus resource in a viewing component on the left half of the screen and positions a related Context resource in a viewing component on the right half of the screen, or vice versa. In other examples, an array may position three or more viewing components with different types of resources. In yet another example, a single-element array may automatically position a viewing component based on the type of resource it displays (e.g., automatically positioning a Focus on the left side of the screen).

[0233] In the example process of FIG. **43**, parameters are stored **(43002)** defining different viewing areas of a display. For example, the parameters for each viewing area may specify an array of pixel coordinates corresponding to a different defined area of the display (e.g., a left half and right half, top half or bottom half, or other defined area). Identifiers for a plurality of digital resources and associations between the digital resources are also initially stored **(43004)**. For example, resources may be stored in different ordered sets which may each be designated as particular types of resources based on designations such as Contexts or Focuses. Each resource may be associated with a plurality of other resources in a designated relationship. For example, a Focus resource may be associated with a plurality of Context resources that may each provide different contextual information relating to the subject of the Focus resource. Data elements are also stored that associate different digital resources with different viewing areas **(43006)**. For example, for a first ordered set of digital resources designated as Focuses, a data element, such as the visual designator "Focus", may store an association linking these resources to a left viewing area, and for a second ordered set of digital resources designated as Contexts, a data element, such as the visual designator "Context", may store an association linking these resources to a right viewing area. A user interface is displayed that includes a user interface element that when selected, causes a visual array to be automatically generated. Selection of the navigation user interface element is detected **(43008)** that indicates an instruction to generate the visual array. In response to this selection, the array management component identifies which resources should be included in the visual array. For example, in one embodiment, the array management component identifies resources pre-selected by a user to be included in the array. In another embodiment, the array management component identifies instances of resources that are already open to be included in the visual array. In yet further embodiments, the array management component may select resources for inclusion in the visual array based on the resource type, associations between resources, or other configurable factors. The array management component then identifies the stored data elements associated with each of the

resources identified for inclusion in the visual array (**43010**), and determines to which predefined viewing area each resource is linked based on the respective data elements (**43012**). Responsive to this determination, the array management component causes respective viewing components displaying each resource to be positioned over their respective associated viewing areas (and optionally re-sized to fit within the defined areas) (**43014**). For example, one or more viewing components displaying resources designated as Focuses may be positioned over a first viewing area (e.g., on the left side) and one or more viewing components displaying resources designated as Contexts may be positioned over a second viewing area (e.g., on the right side). In one embodiment, if a particular resource is not already open in a viewing component but is otherwise identified for inclusion in the array, the array management component may generate a new viewing component and load the resource in the new viewing component. In other cases, if a particular resource designated for inclusion in the visual array is already open in a viewing component, the viewing component may merely be repositioned over the appropriate viewing area. In an alternative embodiment, viewing components themselves may be associated with particular viewing areas (either directly or via a separate data element). For example, a particular viewing component may be associated with Focuses and another viewing component may be associated with Contexts. Then, instead of relying on the associations of the underlying resources themselves, the array management component may detect the association of the viewing component with a particular viewing area and reposition the viewing component over the viewing area during array generation based on the association.

[0234] FIGs. **44A** and **44B** are flowcharts illustrating example operations (**44002** – **44018**) of the system **1000** of FIG. **1** executing an Array Generation Process, generation of an Array of one or more Resources, each Resource in the Array being displayed in a Browser Window positioned over a defined area of the Client Area of the Display Device, referred to herein as a Pane, the Pane and Resource having one or more common Visual Designators. Also, as represented in the figures and description herein, an Event Broker may be used for messaging including between the Application Controller **1040** and the AUI Controller **1042** and/or to the Application Controller **1040** upon Tab and Browser Window Events.

[0235] In the example of FIGs. **44A** and **44B**, in a first instance, an Array Generation Event (AGE) initiates the Array Generation Process (**44002**). In many instances this event is or leads directly to an AUI Controller **1042** or Application Controller **1040** publishing an AGM (**44004**). If this occurs, the AMC targeted by the AGM and possibly one or more Application Controller **1040** components receive the AGM which contains all, some, or none of the

Resource ID and/or Tab Data Attributes for Array Generation (**44006**). Alternatively, other AGEs may occur that do not require the publication of an AGM in order to activate the function of the AMC as described below. The AMC responds to the AGE and retrieves (from the Resource Data Set **1026**) and/or recognizes Resource Data elements to display each Resource intended for display in the Array (**44008**). The AMC retrieves or recognizes one or more Visual Designators for each Resource intended for display in the Array (**44010**). The AMC retrieves or recognizes Pane Configuration Parameters for each Pane of the Array (**44012**). The AMC matches each Resource to one or more Panes by virtue of the Resource's and Pane's one or more common Visual Designators (**44014**). The Application Controller **1040** and/or AMC causes each Array Resource to be displayed in a Tab **1014** of a Browser Window **1012** (**44016**). The AMC positions and sizes each Array Browser Window **1012** to the Pane with which its Resource is associated by a common Visual Designator; the AMC may detach an Array Tab **1014** from a Browser Window **1012** if desirable (**44018**).

[0236] FIGs. **45A** and **45B** are flowcharts illustrating example operations (**45002** – **45018**) of the system **1001** of FIG. **2** executing an Array Generation Process, generation of an Array of one or more Resources, each Resource in the Array being displayed in a Rendered View positioned over a defined area of the Canvas Area of a Browser Window and/or Client Area of the Display Device, referred to herein as a Pane, the Pane and Resource having been associated with one or more common Visual Designators.

[0237] In the example of FIGs. **45A** and **45B**, in a first instance, an Array Generation Event (AGE) initiates the Array Generation Process (**45002**). In many instances this event is or leads directly to an AUI Controller **1043** or Application Controller **1041** publishing an AGM (**45004**). If this occurs, the AMC targeted by the AGM and possibly one or more Application Controller **1041** components receive the AGM which contains all, some, or none of the Resource ID and/or Rendered View Data Attributes for Array Generation (**45006**). Alternatively, other AGEs may occur that do not require the publication of an AGM in order to activate the function of the AMC as described below. The AMC responds to the AGE and retrieves (from the Resource Data Set **1026**) and/or recognizes Resource Data elements to display each Resource intended for display in the Array (**45008**). The AMC retrieves or recognizes one or more Visual Designators for each Resource intended for display in the Array (**45010**). The AMC retrieves or recognizes Pane Configuration Parameters for each Pane of the Array (**45012**). The AMC matches each Resource to one or more Panes by virtue of the Resource's and Pane's one or more common Visual Designators (**45014**). The Application Controller **1041** and/or AMC causes each Array Resource to be displayed in a

Rendered View **1017** of Tab **1015** of a Browser Window **1013** (**45016**). The AMC positions and sizes each Array Rendered Views **1017** to the Pane with which its Resource is associated by a common Visual Designator; the AMC may detach an Array Tab **1015** from a Browser Window **1013** if desirable (**45018**).

[0238] FIGs. **46A**, **46B**, **46C**, **46D**, and **46E** are flowcharts illustrating detailed example operations (**46002** – **46050**) of the system **1000** of FIG. **1** executing an Array Generation Process, generation of an Array of one or more Resources, each Resource in the Array being displayed in a Browser Window positioned over a defined area of the Client Area of the Display Device, referred to herein as a Pane, the Pane and Resource having one or more common Visual Designators. In addition, this process implies, and by explicit references to a Tab Data Set **1074** assumes, the use of a Tab Data Management System (TDMS) that includes one or more of a TDMS' functions as described in FIGs. **12-16**. Also as represented in the figures and description herein, an Event Broker may be used for messaging including between the Application Controller **1040** and the AUI Controller **1042** and/or to the Application Controller **1040** upon Tab and Browser Window Events. For the sake of brevity, one may read an alternative implementation of operations (**46002** – **46050**) by substituting Background Page **1050** in place of Application Controller **1040** and Content Script **1052** in place of AUI Controller **1042**.

[0239] In the example of FIGs. **46A**, **46B**, **46C**, **46D**, and **46E**, in a first instance, selection of an Array Generation Specific UI Element on an AUI may trigger an Array Generation Event (AGE). If this capability exists and such a selection occurs, an AGE is triggered (**46002**). If not, an AGE may be triggered by a wide variety of other methods. The AGE initiates the Array Generation Process (**46004**). In many instances this event is or leads directly to an AUI Controller **1042** or Application Controller **1040** publishing an AGM (**46006**). If this occurs, the AMC targeted by the AGM and possibly one or more Application Controller **1040** components receive the AGM which contains all, some, or none of the Resource ID and/or Tab Data Attributes for Array Generation (**46008**). Alternatively, other AGEs may occur that do not require the publication of an AGM in order to activate the function of the AMC as described below. The AMC responds, and retrieves and/or recognizes remaining Tab Data Attributes useful to display each Resource intended for display in the Array (this may occur at one or more instances throughout the Array Generation Process) (**46010**). The AMC responds, and retrieves (from the Resource Data Set **1026**) and/or recognizes remaining Resource Data elements to display each Resource intended for display in the Array (this may occur at one or more instances throughout the Array Generation Process) (**46012**). The AMC

retrieves or recognizes one or more Visual Designators for each Resource intended for display in the Array (this may occur at one or more instances throughout the Array Generation Process) (**46014**). The AMC retrieves or recognizes Pane Configuration Parameters for each Pane of the Array (this may occur at one or more instances throughout the Array Generation Process) (**46016**). The AMC "matches" each Resource to one or more Panes by virtue of the Resource's and Pane's one or more common Visual Designators (**46018**). The AMC may determine it will need to create one or more new Browser Windows to display one or more Resources intended for display in the Array. If the AMC does, the AMC may check Tab Data Set **1074** for available Targeted Non-Array Tabs (**46020**). If one or more TNATs exist for the AMC, the AMC may adopt one or more Targeted Non-Array Tabs for its Array (**46022**). If a TNAT exists that contains a Resource intended for display in the Array, the AMC may designate the TNAT as an Array Tab and record its relationship to the other Array Tabs (**46024**). The AMC positions and sizes the Array Browser Window **1012** to the Pane with which the Resource is associated by a common Visual Designator; the AMC can detach an Array Tab **1014** from a Browser Window **1012** if warranted (**46026**). These steps may be repeated until the Array is full or TNATs already containing Resources are exhausted (**46028**). If the Array is not full and TNATs already containing Resources have been exhausted then if a TNAT exists that does not contain a Resource intended for display in the Array the AMC, through the Application Controller **1040**, may change a TNAT's URI to that of the intended Resource and, if warranted, completes a navigation process for the Tab **1014** of the TNAT (**46030**). The AMC designates the TNAT as an Array Tab **1014** and records its relationship to the other Array Tabs **1014** (**46032**). The AMC positions and sizes the Array Browser Window **1012** to the Pane with which the Resource is associated by a common Visual Designator; the AMC may detach an Array Tab **1014** from a Browser Window **1012** if warranted (**46034**). These steps may be repeated until the Array is full or the TNATs are exhausted (**46036**). If one or more TNATs do not exist for the AMC, the AMC may determine there are no TNATs available for use in the Array (**46038**). The AMC initiates the creation of a new Browser Window **1012** and Tab **1014** (**46040**). Through the Application Controller **1040**, the AMC changes the new Browser Window's Tab's URI to that of the intended Resource and if warranted completes a navigation process for that Tab **1014** (**46042**). The AMC designates the Tab **1014** as an Array Tab and records its relationship to the other Array Tabs (**46044**). The AMC positions and sizes the Array Browser Window **1012** to the Pane with which the Resource is associated by a common Visual Designator; the AMC may detach an Array Tab **1014** from a Browser Window **1012** if warranted (**46046**).

These steps may be repeated until each Array Resource is in an Array Tab **1014** and Browser Window **1012** (**46048**). If the AMC determines it will not need to create one or more new Browser Windows to display one or more Resources intended for display in the Array, the AMC positions and sizes each Array Browser Window **1012** to the Pane with which its Resource is associated by a common Visual Designator; the AMC may detach an Array Tab **1014** from a Browser Window **1012** if warranted (**46050**).

[0240] FIGs. **47A**, **47B**, **47C**, **47D**, and **47E** are flowcharts illustrating detailed example operations (**47002** – **47050**) of the system **1001** of FIG. **2** executing an Array Generation Process, generation of an Array of one or more Resources, each Resource in the Array being displayed in a Rendered View positioned over a defined area of the Canvas Area of a Browser Window and/or Client Area of the Display Device, referred to herein as a Pane, the Pane and Resource having been associated with one or more common Visual Designators. In addition, this process implies, and by explicit references to a Rendered View Data Set **1075** assumes, the use of a Rendered View Data Management System (RVDMS) that includes one or more of a RVDMS' functions as described in FIGs. **17-21**. Also as represented in the figures and description herein, an Event Broker may be used for messaging including between the Application Controller **1041** and the AUI Controller **1043** and/or to the Application Controller **1041** upon Rendered View, Tab, and Browser Window Events. For the sake of brevity, one may read an alternative implementation of operations (**47002** – **47050**) by substituting Background Page **1051** in place of Application Controller **1041** and Content Script **1053** in place of AUI Controller **1043**.

[0241] In the example of FIGs. **47A**, **47B**, **47C**, **47D**, and **47E**, in a first instance, selection of an Array Generation Specific UI Element on an AUI may trigger an Array Generation Event (AGE). If this capability exists and such a selection occurs, an AGE is triggered (**47002**). If not an AGE may be triggered by a wide variety of other methods. The AGE initiates the Array Generation Process (**47004**). In many instances this event is or leads directly to an AUI Controller **1043** or Application Controller **1041** publishing an AGM (**47006**). If this occurs, the AMC targeted by the AGM and possibly one or more Application Controller **1041** components receive the AGM which contains all, some, or none of the Resource ID and/or Rendered View Data Attributes for Array Generation (**47008**). Alternatively, other AGEs may occur that do not require the publication of an AGM in order to activate the function of the AMC as described below. The AMC responds, and retrieves and/or recognizes remaining Rendered View Data Attributes useful to display each Resource intended for display in the Array (this may occur at one or more instances throughout the Array Generation Process)

(47010). The AMC responds, and retrieves (from the Resource Data Set 1026) and/or recognizes remaining Resource Data elements to display each Resource intended for display in the Array (this may occur at one or more instances throughout the Array Generation Process) (47012). The AMC retrieves or recognizes one or more Visual Designators for each Resource intended for display in the Array (this may occur at one or more instances throughout the Array Generation Process) (47014). The AMC retrieves or recognizes Pane Configuration Parameters for each Pane of the Array (this may occur at one or more instances throughout the Array Generation Process) (47016). The AMC "matches" each Resource to one or more Panes by virtue of the Resource's and Pane's one or more common Visual Designators (47018). The AMC may determine it will need to create one or more new Rendered Views to display one or more Resources intended for display in the Array. If the AMC does, the AMC checks Rendered View Data 1075 for available Targeted Non-Array Rendered Views (47020). If one or more TNARVs exist for the AMC, the AMC may adopt one or more Targeted Non-Array Rendered Views for its Array (47022). If a TNARV exists that contains a Resource intended for display in the Array, the AMC may designate the TNARV as an Array Rendered View and record its relationship to the other Array Rendered Views (47024). The AMC positions and sizes the Array Rendered View 1017 to the Pane with which the Resource is associated by a common Visual Designator; the AMC may detach an Array Tab 1015 from a Browser Window 1013 if warranted (47026). These steps may be repeated until the Array is full or until TNARVs already containing Resources are exhausted (47028). If the Array is not full and TNATs already containing Resources have been exhausted then if a TNARV exists that does not contain a Resource intended for display in the Array the AMC, through the Application Controller 1041, may change a TNARV's URI to that of the intended Resource and, if warranted, may complete a navigation process for the Rendered View of the TNARV (47030). The AMC designates the TNARV as an Array Rendered View 1017 and records its relationship to the other Array Rendered Views (47032). The AMC positions and sizes the Array Rendered View 1017 to the Pane with which the Resource is associated by a common Visual Designator; the AMC may detach an Array Tab 1015 from a Browser Window 1013 if warranted (47034). These steps may be repeated until the Array is full or TNARVs are exhausted (47036). If one or more TNARVs do not exist for the AMC, the AMC may determine there are no TNARVs available for use in the Array (47038). The AMC initiates the creation of a new Browser Window, Tab, and/or Rendered View (47040). Through the Application Controller 1041, the AMC changes the new Browser Window's Tab's Rendered View's URI to that of the intended Resource and if warranted

completes a navigation process for that Rendered View **1017** (**47042**). The AMC designates the Rendered View as an Array Rendered View and records its relationship to the other Array Rendered Views (**47044**). The AMC positions and sizes the Array Rendered View **1017** to the Pane with which the Resource is associated by a common Visual Designator; the AMC may detach an Array Tab **1015** from a Browser Window **1013** if warranted (**47046**). These steps may be repeated until each Array Resource is in an Array Rendered View **1017** and Browser Window **1013** (**47048**). If the AMC determines it will not need to create one or more new Rendered Views to display one or more Resources intended for display in the Array, the AMC positions and sizes each Array Rendered View **1017** to the Pane with which its Resource is associated by a common Visual Designator; the AMC can detach an Array Tab **1015** from a Browser Window **1013** if warranted (**47050**).

[0242] FIG. **48** illustrates an embodiment of a process for controlling navigation between digital resources. Particularly, where multiple resources may be concurrently displayed, the process of FIG. **48** enables automatic navigation to a resource having a known association with another resource to which navigation is requested. For example, when navigating to a new Focus in a first digital resource viewing component (e.g., a first browser window, tab, or view), a navigation handler may automatically initiate navigation to a Context that is associated with the new Focus (e.g., the first Context in the ordered sequence of Context resources) in a second digital resource viewing component (e.g., a second browser window, tab, or second view in the first browser window) that may be concurrently displayed. Thus, the system beneficially presents the user with a contextual resource relevant to the resource to which navigation is requested, and may enable the user to concurrently view these resources in a convenient manner.

[0243] In the example process of FIG. **48**, identifiers for a plurality of digital resources and associations between the digital resources are initially stored (**48002**). For example, resources may be stored in different ordered sets which may each be designated as particular types of resources such as Contexts or Focuses. Each resource may be associated with a plurality of other resources in a designated relationship. For example, a Focus resource may be associated with a plurality of Context resources that may each provide different contextual information relating to the subject of the Focus resource. A display device may initially display (**48004**) a set of two or more resources. For example, a first Focus may be initially displayed in a first viewing component and an associated Context may be displayed initially in a second viewing component. In another example, the initially displayed resources may comprise another set of resources that do not necessarily include a related Focus and Context

(e.g., two Focuses, two Contexts, or unlabeled resources). A user interface is also displayed (**48006**) that includes various user interface elements that when selected enable navigation between digital resources. For example, the user interface element may include next and previous buttons that enable navigation to a next or previous resource in the ordered set of resources of which the initially displayed resource is a member. Additionally, the user interface element may enable navigation to other resources in the ordered set or to resources that are not necessarily members of the same ordered set. Selection of the navigation user interface element is detected (**48008**). This selection indicates a request to navigate to a new resource in the first viewing component. For example, in the case that the first viewing component displays a Focus in an ordered set of Focuses, the user interface element may cause navigation to a next or previous Focus in this set. In response to the selection, navigation to the new resource in the first viewing component is initiated (**48010**). An array management component then detects (**48012**) other resources that have stored associations with the new resource to which navigation is requested. These may be, for example, a set of Context resources associated with a new Focus resource being navigated to in the first viewing component. Alternatively, the related resources may include other resources with stored associations with the newly loaded resource that is not necessarily a Focus-Context relationship. In response to detecting the one or more associations to other resources, the array management component automatically initiates (**48014**) navigation to one of the detected related resources in the second viewing component. For example, if the requested resource is associated with multiple other resources, one of the associated resources may be selected to display in the second viewing component. For example, where the associated resources are part of an ordered set of resources (such as an ordered set of Contexts associated with a selected Focus), the first numerically ordered resource in the set may be selected.

[0244] In one embodiment, the array management component may furthermore automatically select which viewing component of multiple available viewing components (e.g., multiple open tabs, browser windows, or views of a browser window or tab) to use for navigating to the related resource. In this embodiment, the array management component may detect a previously stored association between the first viewing component and the second viewing component, and select the second component for displaying the related resource based on this known association. For example, if a second viewing component is already being used to view Context resources related to a particular Focus in a first viewing component, a Focus-Context association may be stored for the first and second viewing component. The

relationship may be detected, thus causing the array management component to select the second viewing component for navigating to the associated resource.

[0245] FIG. **49** is a flowchart illustrating example operations (**49002** – **49012**) of the system **1000** of FIG. **1** executing an Array Responsive Action Process, enablement of an event affecting the display of an Array Resource and/or its Tab and/or its Browser Window to affect the display of another Array Resource and/or its Tab and/or its Browser Window.

[0246] In the example of FIG. **49**, in a first instance, an Event X Message 1 associated with a Tab 1, Browser Window 1 is published (for this example, the "1" in Event X Message 1 represents that Event X Message 1 is the first instance of any number of possible Event X Messages in the description. The "1" in both Tab 1 and Browser Window 1 represents any open Tab **1014** and Browser Window **1012** of a Browser Application **1032**) (**49002**). The Event X Handler **1100** / Application Controller **1040** receives Event X Message 1 associated with a Tab 1, Browser Window 1 (**49004**). The one or more processes initiated by Event X Message 1 are carried out for Tab 1, Browser Window 1 (**49006**). One or more AMCs' Event X AMH **1106** receives the same Event X Message 1 (or one derived from it) as received by the Event X Handler (**49008**). The one or more AMCs' Event X AMH **1106** initiates one or more Event Messages "i" for one or more Array or TNAT Tabs **1014**; each AMC may initiate a unique Event Message for each Array or TNAT Tab **1014** depending on the desired behavior for each of the latter Tabs that is to be associated with the initial Event X Message 1 in Tab 1, Browser Window 1 (because one or more of the Event Messages generated by the Event X AMH may be one or more other instances of an Event X Message, the range of all possible Event Messages generated by the Event X AMH is represented as Event Messages "i"; therefore Event Messages "i" represents any number of Event X Messages and/or other kinds of Event Messages; by extension of the same logic, Event processes "i" has been used instead of Event X processes "i" to represent the range of processes that may be executed to completion upon generation of the corresponding Event Message for each) (**49010**). Event processes "i" are executed to completion for the latter one or more Array and/or TNAT Tabs **1014** (**49012**). As noted, the RSPP may include processes similar to the Array Responsive Action Process in which a Visual Designator may be the PCPs of a Pane itself. In such a case, a component, similar in function to an AMC, may manage the responsive actions between associated tabs and/or the Resources displayed in them.

[0247] FIG. **50** is a flowchart illustrating example operations (**50002** – **50012**) of the system **1001** of FIG. **2** executing an Array Responsive Action Process, enablement of an event affecting the display of an Array Resource and/or its Rendered View and/or its Tab and/or its

Browser Window to affect the display of another Array Resource and/or its Rendered View and/or its Tab and/or its Browser Window.

[0248] In the example of FIG. **50**, in a first instance, an Event X Message 1 associated with a Rendered View 1, Tab 1, Browser Window 1 is published (for this example, the "1" in Event X Message 1 represents that Event X Message 1 is the first instance of any number of possible Event X Messages in the description. The "1" in Rendered View 1, Tab 1, and Browser Window 1 represents any Rendered View, Tab and Browser Window of a Browser Application **1033**) (**50002**). The Event X Handler **1101** / Application Controller **1041** receives Event X Message 1 associated with a Rendered View 1, Tab 1, Browser Window 1 (**50004**). The one or more processes initiated by Event X Message 1 are carried out for Rendered View 1, Tab 1, Browser Window 1 (**50006**). One or more AMCs' Event X AMH **1107** receives the same Event X Message 1 (or one derived from it) as received by the Event X Handler (**50008**). The one or more AMCs' Event X AMH **1107** initiates one or more Event Messages "i" for one or more Array or TNARV Rendered Views **1017**; each AMC may initiate a unique Event Message for each Array or TNARV Rendered View **1017** depending on the desired behavior for each of the latter Rendered Views that is to be associated with the initial Event X Message 1 in Rendered View 1, Tab 1, Browser Window 1 (because one or more of the Event Messages generated by the Event X AMH may be one or more other instances of an Event X Message, the range of all possible Event Messages generated by the Event X AMH is represented as Event Messages "i"; therefore Event Messages "i" represents any number of Event X Messages and/or other kinds of Event Messages; by extension of the same logic, Event processes "i" has been used instead of Event X processes "i" to represent the range of processes that may be executed to completion upon generation of the corresponding Event Message for each) (**50010**). Event processes "i" are executed to completion for the latter one or more Array and/or TNARV Rendered Views **1017** (**50012**).

[0249] FIG. **51** is a flowchart illustrating detailed example operations (**51002 – 51012**) of the system **1000** of FIG. **1** executing an Array Responsive Action Process, enablement of an event affecting the display of an Array Resource and/or its Tab and/or its Browser Window to affect the display of another Array Resource and/or its Tab and/or its Browser Window. In addition, this figure assumes the existence of a TDMS that includes one or more of a TDMS' functions as described in FIGs. **12-16**. A TDMS is desirable to ensure an AMC understands which of its Tabs to affect with a responsive action and, in a case where there is more than one AMC and Array, a means for tracking the Tab Data Attribute Sets of each Array by assigning each Tab Data Attribute Set an AMC ID, a data element that indicates the AMC

and Array of which the Tab Data Attribute Set is a part. For the sake of brevity and to avoid redundancy, one may read an alternative implementation of operations (**51002** – **51012**) by substituting Background Page **1050** in place of Application Controller **1040**.

[0250] In the example of FIG. **51**, in a first instance, an Event X Message 1 associated with a Tab 1, Browser Window 1 is published (for this example, the "1" in Event X Message 1 represents that Event X Message 1 is the first instance of any number of possible Event X Messages in the description. The "1" in both Tab 1 and Browser Window 1 represents any open Tab **1014** and Browser Window **1012** of a Browser Application **1032**) (**51002**). Application Controller's **1040** Event X Handler **1100** receives Event X Message 1 associated with a Tab 1, Browser Window 1 (**51004**). The one or more processes initiated by Event X Message 1 are carried out for Tab 1, Browser Window 1 (**51006**). One or more AMCs' Event X AMH **1106** of the Application Controller **1040** receives the same Event X Message 1 (or one derived from it) as received by the Event X Handler (**51008**). The one or more AMCs' Event X AMH **1106** initiates one or more Event Messages "i" for one or more Array or TNAT Tabs **1014**; each AMC may initiate a unique Event Message for each Array or TNAT Tab **1014** depending on the desired behavior for each of the latter Tabs that is to be associated with the initial Event X Message 1 in Tab 1, Browser Window 1 (because one or more of the Event Messages generated by the Event X AMH may be one or more other instances of an Event X Message, the range of all possible Event Messages generated by the Event X AMH is represented as Event Messages "i"; therefore Event Messages "i" represents any number of Event X Messages and/or other kinds of Event Messages; by extension of the same logic, Event processes "i" has been used instead of Event X processes "i" to represent the range of processes that may be executed to completion upon generation of the corresponding Event Message for each) (**51010**). Event processes "i" are executed to completion for the latter one or more Array and/or TNAT Tabs **1014** (**51012**).

[0251] FIG. **52** is a flowchart illustrating detailed example operations (**52002** – **52014**) of the system **1000** of FIG. **1** executing an Array Responsive Action Process specific to a Navigation Process. In addition, this figure assumes the existence of a TDMS that includes one or more of a TDMS' functions as described in FIGs. **12-16**. A TDMS is desirable to ensure an AMC understands which of its Tabs to affect with a responsive action and, in a case where there is more than one AMC and Array, a means for tracking the Tab Data Attribute Sets of each Array by assigning each Tab Data Attribute Set an AMC ID, a data element that indicates the AMC and Array of which the Tab Data Attribute Set is a part. For the sake of brevity and to avoid redundancy, one may read an alternative implementation of

operations (**52002** – **52014**) by substituting Background Page **1050** in place of Application Controller **1040**, Content Script **1052** in place of AUI Controller **1042**, and Page-bound DNUI **1022** or **1024** in place of Browser-bound **1020**.

[0252] In the example of FIG. **52**, in a first instance, a Navigation Specific UI Element **1096** on the Browser-bound DNUI **1020** is selected to navigate to a Resource and/or Resource Set in a Tab 1, Browser Window 1 according to the Resource Set's creator's intended scope and sequence (the "1" in both Tab 1 and Browser Window 1 represents any open Tab **1014** and Browser Window **1012** of a Browser Application **1032**) (**52002**). An AUI Controller **1042** sends a Navigate Message 1 to the Application Controller's **1040** Navigate Handler (an Event X Handler **1100**) indicating the Resource and/or Resource Set to which the user intends to navigate a Tab 1, Browser Window 1 and informing the Application Controller **1040** to build a corresponding Dynamic Navigation UI View State and Resource Data Message (for this example, the "1" in Navigate Message 1 represents that Navigate Message 1 is the first instance of any number of possible Navigate Messages in the description) (**52004**). The Application Controller's **1040** Navigate Handler receives the Navigate Message 1 (**52006**). The Navigation Process for Tab 1, Browser Window 1 is executed to completion (**52008**). The Application Controller's **1040** AMC's Navigate AMH (an Event X AMH **1106**) receives the same Navigate Message 1 (or one derived from it) as above (**52010**). The Application Controller's **1040** AMC's Navigate AMH initiates one or more Navigate Message "i"s for one or more Array or TNAT Tabs **1014** other than Tab 1, Browser Window 1 indicating the Resource and/or Resource Set to which the Tabs should navigate according to the Resource Set's creator's intended scope and sequence (because one or more of the Navigate Messages generated by the Navigate AMH may be one or more other instances of a Navigate Message, the range of possible Navigate Messages generated by the Navigate AMH is represented as Navigate Messages "i"; therefore Navigate Messages "i" represents any number of Navigate Messages; by extension of the same logic, "i" Navigation Processes has been used to represent the range of Navigation Processes that may be executed to completion upon generation of the corresponding Navigate Message for each) (**52012**). The Application Controller's **1040** Navigate Handler receives the Navigate Message "i"s. "i" Navigation Processes are executed to completion for the latter one or more Array and/or TNAT Tabs **1014** (**52014**).

[0253] FIG. **53** is a flowchart illustrating detailed example operations (**53002** – **53014**) of the system **1001** of FIG. **2** executing an Array Responsive Action Process specific to a Navigation Process. In addition, this figure assumes the existence of a RVDMS that includes

one or more of a RVDMS' functions as described in FIGs. **17-21**. A RVDMS is desirable to ensure an AMC understands which of its Rendered Views to affect with a responsive action and, in a case where there is more than one AMC and Array, a means for tracking the Rendered Views Data Attribute Sets of each Array by assigning each Rendered View Data Attribute Set an AMC ID, a data element that indicates the AMC and Array of which the Rendered Views Data Attribute Set is a part. For the sake of brevity and to avoid redundancy, one may read an alternative implementation of operations (**53002** – **53014**) by substituting Background Page **1051** in place of Application Controller **1041**, Content Script **1053** in place of AUI Controller **1043**.

[0254] In the example of FIG. **53**, in a first instance, a Navigation Specific UI Element **1096** on a DNUI is selected to navigate to a Resource and/or Resource Set in a Rendered View 1, Tab 1, Browser Window 1 according to the Resource Set's creator's intended scope and sequence (the "1" in Rendered View 1, Tab 1, and Browser Window 1 represents any Rendered View, Tab, and Browser Window of a Browser Application **1033**) (**53002**). An AUI Controller **1043** sends a Navigate Message 1 to the Application Controller's **1041** Navigate Handler (an Event X Handler **1101**) indicating the Resource and/or Resource Set to which the user intends to navigate a Rendered View 1, Tab 1, Browser Window 1 and informing the Application Controller **1041** to build a corresponding Dynamic Navigation UI View State and Resource Data Message (for this example, the "1" in Navigate Message 1 represents that Navigate Message 1 is the first instance of any number of possible Navigate Messages in the description) (**53004**). The Application Controller's **1041** Navigate Handler receives the Navigate Message 1 (**53006**). The Navigation Process for Rendered View 1, Tab 1, Browser Window 1 is executed to completion (**53008**). The Application Controller's **1041** AMC's Navigate AMH (an Event X AMH **1107**) receives the same Navigate Message 1 (or one derived from it) as above (**53010**). The Application Controller's **1041** AMC's Navigate AMH initiates one or more Navigate Message "i"s for one or more Array or TNARV Rendered Views other than Rendered View 1, Tab 1, Browser Window 1 indicating the Resource and/or Resource Set to which the Rendered Views should navigate according to the Resource Set's creator's intended scope and sequence (because one or more of the Navigate Messages generated by the Navigate AMH may be one or more other instances of a Navigate Message, the range of possible Navigate Messages generated by the Navigate AMH is represented as Navigate Messages "i"; therefore Navigate Messages "i" represents any number of Navigate Messages; by extension of the same logic, "i" Navigation Processes has been used to represent the range of Navigation Processes that may be executed to completion

upon generation of the corresponding Navigate Message for each) (**53012**). The Application Controller's **1041** Navigate Handler receives the Navigate Message "i"s. "i" Navigation Processes are executed to completion for the latter one or more Array and/or TNARV Rendered Views **1017** (**53014**).

[0255] The processes described herein are generally described in a sequential manner. However, it may be appreciated that the steps may execute in a partially or completely overlapping (e.g., parallel) manner. Further, the steps may occur in an order different than that shown, may include additional or different operations not specifically illustrated, and/or may omit illustrated steps. Further, it should be noted and as implied earlier in the description, several steps in these figures may be accomplished by a number of ways by varying the location of the data elements and degree of programmatic function of one or more steps.

[0256] The foregoing description of the embodiments has been presented for the purpose of illustration; it is not intended to be exhaustive or to limit the patent rights to the precise forms disclosed. Persons skilled in the relevant art can appreciate that many modifications and variations are possible in light of the above disclosure.

[0257] Some portions of this description describe the embodiments in terms of algorithms and symbolic representations of operations on information. These algorithmic descriptions and representations are commonly used by those skilled in the data processing arts to convey the substance of their work effectively to others skilled in the art. These operations, while described functionally, computationally, or logically, are understood to be implemented by computer programs or equivalent electrical circuits, microcode, or the like. Furthermore, it has also proven convenient at times, to refer to these arrangements of operations as modules, without loss of generality. The described operations and their associated modules may be embodied in software, firmware, hardware, or any combinations thereof.

[0258] Any of the steps, operations, or processes described herein may be performed or implemented with one or more hardware or software modules, alone or in combination with other devices. In one embodiment, a software module is implemented with a non-transitory computer-readable storage medium containing computer-executable instructions which can be executed by a computer processor for performing any or all of the steps, operations, or processes described.

[0259] Embodiments may also relate to an apparatus for performing the operations herein. This apparatus may be specially constructed for the required purposes, and/or it may comprise a general-purpose computing device selectively activated or reconfigured by a

computer program stored in the computer. Such a computer program may be stored in a non-transitory, tangible computer readable storage medium, or any type of media suitable for storing electronic instructions, which may be coupled to a computer system bus. Furthermore, any computing systems referred to in the specification may include a single processor or may be architectures employing multiple processor designs for increased computing capability.

[0260] Embodiments may also relate to a product that is produced by a computing process described herein. Such a product may comprise information resulting from a computing process, where the information is stored on a non-transitory, tangible computer readable storage medium and may include any embodiment of a computer program product or other data combination described herein.

[0261] Finally, the language used in the specification has been principally selected for readability and instructional purposes, and it may not have been selected to delineate or circumscribe the patent rights. It is therefore intended that the scope of the patent rights be limited not by this detailed description, but rather by any claims that issue on an application based hereon. Accordingly, the disclosure of the embodiments is intended to be illustrative, but not limiting, of the scope of the patent rights.

CLAIMS

1. A method for controlling navigation between digital resources in an application executing on a client device in a networked computer environment, the method comprising:

storing by a memory of the client device, identifiers for at least a first digital resource, a second digital resource, a third digital resource, and a fourth digital resource, the first and third digital resources in a first ordered set of digital resources, the second digital resource in a second ordered set of digital resources and the fourth digital resource in a third ordered set of digital resources, the fourth digital resource having a stored association with the third digital resource;

displaying the first digital resource of the first ordered set of digital resources in a first digital resource viewing component and the second digital resource of the second ordered set of digital resources in a second digital resource viewing component;

causing, by a processor of the client device, a display to display a user interface element for navigating between the digital resources;

detecting, by the processor, a selection of the user interface element;

responsive to the selection of the user interface element, initiating, by the processor, navigation from the first digital resource to the third digital resource of the first ordered set of digital resources in the first digital resource viewing component;

detecting, by the processor, the stored association between the third digital resource and the fourth digital resource; and

responsive to detecting the stored association, initiating, by the processor, navigation from the second digital resource of the second ordered set of digital resources to the fourth digital resource of the third ordered set of digital resources in the second digital resource viewing component.

2. The method of claim 1, further comprising:

storing, by the memory, an association between the first digital resource viewing component and the second digital resource viewing component;

wherein initiating the navigation from the second digital resource of the second ordered set of digital resources to the fourth digital resource in the third ordered set of digital resources comprises:

detecting, by the processor, the association between the first digital resource viewing component and second digital resource viewing component; and

responsive to detecting the association, designating the second digital resource viewing component for loading the fourth digital resource.

3. The method of claim 1, wherein the first digital resource viewing component comprises a first browser window or tab and the second digital resource viewing component comprises a second browser window or tab.

4. The method of claim 1, further comprising:

storing, by the memory, first parameters defining a first viewing area of the display and second parameters defining a second viewing area of the display, wherein each of the first ordered set of digital resources are associated with the first viewing area, and wherein the second ordered set of digital resources are associated with the second viewing area; and

responsive to one or more instructions to display the first digital resource and the second digital resource, detecting that the first digital resource is associated with the first viewing area and detecting that the second digital resource is associated with the second viewing area;

wherein displaying the first digital resource and the second digital resource comprises positioning the first digital resource viewing component over the first viewing area responsive to detecting that the first digital resource is associated with the first viewing area and positioning the second digital resource viewing component over the second viewing area responsive to the detecting that the second digital resource is associated with the second viewing area.

5. The method of claim 4, wherein the first viewing area comprises a first defined area of a web browser window and wherein the second viewing area comprises a second defined area of the web browser window.

6. The method of claim 4, further comprising:

storing, by the memory, a first data element associating each of the first ordered set of digital resources with the first viewing area; and

storing a second data element associating each of the second ordered set of digital resources with the second viewing area.

7. The method of claim 4, further comprising:

storing a direct association between the first parameters defining the first viewing area and each of the first ordered set of digital resources; and

storing a direct association between the second parameters defining the second viewing area and each of the second ordered set of digital resources.

8. The method of claim 1, wherein the first digital resource comprises at least a first portion of a webpage of a first origin and wherein the second digital resource comprises at least a second portion of a webpage of a second origin unique from the first origin.

9. The method of claim 1,

wherein initiating the navigation from the first digital resource to the third digital resource comprises:

sending a navigate message identifying the third resource to a navigation handler component;

responsive to the navigate message, executing by the navigation handler component, a navigation process to load the third digital resource in the first digital resource viewing component and to update a resource identifier display element identifying the third digital resource; and

wherein initiating the navigation from the second digital resource to the fourth digital resource comprises:

sending the navigate message identifying the third digital resource to an array management handler component;

responsive to the navigate message, identifying by the array management handler component, a fourth digital resource of the third ordered set of digital resources associated with the third digital resource; and

selecting the fourth digital resource from the third ordered set of digital resources as an initial display resource for display in association with the third digital resource.

10. The method of claim 1, wherein the first digital resource viewing component and the second digital resource viewing component comprise components of a same digital resource viewing application.

11. The method of claim 1, wherein the first digital resource viewing component and the second digital resource viewing component comprise components of different digital resource viewing applications.

12. A non-transitory computer-readable storage medium storing instruction for controlling navigation between digital resources in an application executing on a client device in a networked computer environment, the instructions when executed by a processor causing the processor to perform steps including:

storing identifiers for at least a first digital resource, a second digital resource, a third digital resource, and a fourth digital resource, the first and third digital resources in a first ordered set of digital resources, the second digital resource in a second ordered set of digital resources and the fourth digital resource in a third ordered set of digital resources, the fourth digital resource having a stored association with the third digital resource;

displaying the first digital resource of the first ordered set of digital resources in a first digital resource viewing component and the second digital resource of the second ordered set of digital resources in a second digital resource viewing component;

causing a display to display a user interface element for navigating between the digital resources;

detecting a selection of the user interface element;

responsive to the selection of the user interface element, initiating, by the processor, navigation from the first digital resource to the third digital resource of the first ordered set of digital resources in the first digital resource viewing component;

detecting the stored association between the third digital resource and the fourth digital resource; and

responsive to detecting the stored association, initiating navigation from the second digital resource of the second ordered set of digital resources to the fourth digital resource of the third ordered set of digital resources in the second digital resource viewing component.

13. The non-transitory computer-readable storage medium of claim 12, the instructions when executed further causing the processor to perform steps including:

storing an association between the first digital resource viewing component and the second digital resource viewing component;

wherein initiating the navigation from the second digital resource of the second ordered set of digital resources to the fourth digital resource in the third ordered set of digital resources comprises:

detecting the association between the first digital resource viewing component and second digital resource viewing component; and

responsive to detecting the association, designating the second digital resource viewing component for loading the fourth digital resource.

14. The non-transitory computer-readable storage medium of claim 12, wherein the first digital resource viewing component comprises a first browser window or tab and the second digital resource viewing component comprises a second browser window or tab.

15. The non-transitory computer-readable storage medium of claim 12, the instructions when executed further causing the processor to perform steps including:

storing first parameters defining a first viewing area of the display and second parameters defining a second viewing area of the display, wherein each of the first ordered set of digital resources are associated with the first viewing area, and wherein the second ordered set of digital resources are associated with the second viewing area; and

responsive to one or more instructions to display the first digital resource and the second digital resource, detecting that the first digital resource is associated with the first viewing area and detecting that the second digital resource is associated with the second viewing area;

wherein displaying the first digital resource and the second digital resource comprises positioning the first digital resource viewing component over the first viewing area responsive to detecting that the first digital resource is associated with the first viewing area and positioning the second digital resource viewing component over the second viewing area responsive to the detecting that the second digital resource is associated with the second viewing area.

16. The non-transitory computer-readable storage medium of claim 15, wherein the first viewing area comprises a first defined area of a web browser window and wherein the second viewing area comprises a second defined area of the web browser window.

17. The non-transitory computer-readable storage medium of claim 15, the instructions when executed further causing the processor to perform steps including:

storing a first data element associating each of the first ordered set of digital resources with the first viewing area; and

storing a second data element associating each of the second ordered set of digital resources with the second viewing area.

18. The non-transitory computer-readable storage medium of claim 15, the instructions when executed further causing the processor to perform steps including:

storing a direct association between the first parameters defining the first viewing area and each of the first ordered set of digital resources; and

storing a direct association between the second parameters defining the second viewing area and each of the second ordered set of digital resources.

19. The non-transitory computer-readable storage medium of claim 12, wherein the first digital resource comprises at least a first portion of a webpage of a first origin and wherein the second digital resource comprises at least a second portion of a webpage of a second origin unique from the first origin.

20. The non-transitory computer-readable storage medium of claim 12,

wherein initiating the navigation from the first digital resource to the third digital resource comprises:

sending a navigate message identifying the third resource to a navigation handler component;

responsive to the navigate message, executing by the navigation handler component, a navigation process to load the third digital resource in the first digital resource viewing component and to update a resource identifier display element identifying the third digital resource; and

wherein initiating the navigation from the second digital resource to the fourth digital resource comprises:

sending the navigate message identifying the third digital resource to an array management handler component;

responsive to the navigate message, identifying by the array management handler component, a fourth digital resource of the third ordered set of digital resources associated with the third digital resource; and

selecting the fourth digital resource from the third ordered set of digital resources as an initial display resource for display in association with the third digital resource.

21. The non-transitory computer-readable storage medium of claim 12, wherein the first digital resource viewing component and the second digital resource viewing component comprise components of a same digital resource viewing application.

22. The non-transitory computer-readable storage medium of claim 12, wherein the first digital resource viewing component and the second digital resource viewing component comprise components of different digital resource viewing applications.

23. A computer device comprising:

a processor; and

a non-transitory computer-readable storage medium storing instruction for controlling navigation between digital resources in an application executing on a client device in a networked computer environment, the instructions when executed by a processor causing the processor to perform steps including:

storing identifiers for at least a first digital resource, a second digital resource, a third digital resource, and a fourth digital resource, the first and third digital resources in a first ordered set of digital resources, the second digital resource in a second ordered set of digital resources and the fourth digital resource in a third ordered set of digital resources, the fourth digital resource having a stored association with the third digital resource;

displaying the first digital resource of the first ordered set of digital resources in a first digital resource viewing component and the second digital resource of the second ordered set of digital resources in a second digital resource viewing component;

causing a display to display a user interface element for navigating between the digital resources;

detecting a selection of the user interface element;

responsive to the selection of the user interface element, initiating, by the processor, navigation from the first digital resource to the third digital resource of the first ordered set of digital resources in the first digital resource viewing component;

detecting the stored association between the third digital resource and the fourth digital resource; and

responsive to detecting the stored association, initiating navigation from the second digital resource of the second ordered set of digital resources to the fourth digital resource of the third ordered set of digital resources in the second digital resource viewing component.

24. A method for generating a visual array of digital resources, the method executing on a client device in a networked computer environment, the method comprising:

storing, by a memory of the client device, first parameters defining a first viewing area of a display and second parameters defining a second viewing area of a display;

storing by the memory, identifiers for each of a first ordered set of digital resources and each of a second ordered set of digital resources;

storing by the memory, a first data element associating each of the first ordered set of digital resources with the first viewing area;

storing by the memory, a second data element associating each of the second ordered set of digital resources with the second viewing area;

causing, by a processor of the client device, the display to display a user interface element for generating the visual array;

detecting, by the processor, a selection of the user interface element;

responsive to the selection of the user interface element, identifying for inclusion in the visual array, at least a first digital resource from the first ordered set of digital resources and a second digital resource from the second ordered set of digital resources;

identifying the first data element corresponding to the first digital resource and determining that the first data element associates the first digital resource with the first viewing area;

responsive to determining that the first data element associates the first digital resource with the first viewing area, causing a first digital resource viewing component displaying the first digital resource to be positioned over the first viewing area of the display;

identifying the second data element corresponding to the second digital resource and determining that the second data element associates the second digital resource with the second viewing area; and

responsive to determining that the second data element associates the second digital resource with the second viewing area, causing a second digital resource viewing component displaying the second digital resource to be positioned over the second viewing area of the display.

25. The method of claim 24, wherein causing the first digital resource viewing component displaying the first digital resource to be positioned over the first viewing area of the display comprises generating the first digital resource viewing component and loading the first digital resource in the first digital resource viewing component, and wherein causing the second digital resource viewing component displaying the second digital resource to be positioned over the second viewing area of the display comprises generating the second digital resource viewing component and loading the second digital resource in the second digital resource viewing component.

26. The method of claim 24, further comprising:

storing by the memory, an association between the first digital resource and second digital resource; and

wherein identifying the second digital resource for inclusion in the visual array comprises detecting the association between the first digital resource and second digital resource.

27. The method of claim 26, wherein causing the second digital resource viewing component displaying the second digital resource to be positioned over the second viewing area of the display comprises:

detecting that the second digital resource viewing component is not present, generating the second digital resource viewing component, and loading the second digital resource in the second digital resource viewing component.

28. The method of claim 24, wherein the first digital resource viewing component and the second digital resource viewing component comprise components of a same digital resource viewing application.

29. The method of claim 28, wherein the digital resource viewing application is a web browser.

30. The method of claim 28, wherein the first viewing area comprises a first defined area of a web browser window and wherein the second viewing area of the display comprises a second defined area of the web browser window.

31. The method of claim 24, wherein the first digital resource viewing component and the second digital resource viewing component comprise components of different digital resource viewing applications.

32. The method of claim 24, wherein the first digital resource comprises at least a first portion of a webpage of a first origin and wherein the second digital resource comprises at least a second portion of a webpage of a second origin unique from the first origin.

33. The method of claim 24, further comprising:

receiving, by the client device, an instruction to share the visual array;

sending, by the client device, identifying information for the first digital resource, parameters for the first viewing area, an association between the first digital resource with the first viewing area, identifying information for the second digital resource, parameters for the second viewing area, and an association between the second digital resource with the second viewing area to a remote server for accessing by another client device in the networked computer environment.

34. A method for generating a visual array of digital resources, the method executing on a client device in a networked computer environment, the method comprising:

storing, by a memory of the client device, first parameters defining a first viewing area of a display and second parameters defining a second viewing area of a display;

storing by the memory, identifiers for a first digital resource viewing component and a second digital resource viewing component;

storing by the memory, a first data element associating the first digital resource viewing component with the first viewing area;

storing by the memory, a second data element associating the second digital resource viewing component with the second viewing area;

storing by the memory, an association between the first digital resource viewing component and second digital resource viewing component;

causing, by a processor of the client device, the display to display a user interface element for generating the visual array;

detecting, by the processor, a selection of the user interface element;

responsive to the selection of the user interface element, identifying for inclusion in the visual array, at least the first digital resource viewing component;

identifying the first data element corresponding to the first digital resource viewing component and determining that the first data element associates the first digital resource viewing component with the first viewing area;

responsive to determining that the first data element associates the first digital resource viewing component with the first viewing area, causing the first digital resource viewing component displaying a first digital resource to be positioned over the first viewing area of the display;

detecting that the second digital resource viewing component is associated with the first digital resource viewing component;

responsive to detecting the second digital resource viewing component is associated with the first digital resource viewing component, identifying for inclusion in the visual array the second digital resource viewing component;

identifying the second data element corresponding to the second digital resource viewing component and determining that the second data element associates the second digital resource viewing component with the second viewing area; and

responsive to determining that the second data element associates the second digital resource viewing component with the second viewing area, causing the second digital resource viewing component displaying a second digital resource to be positioned over the second viewing area of the display.

35. The method of claim 34, wherein the first digital resource viewing component and the second digital resource viewing component comprise components of a same digital resource viewing application.

36. The method of claim 35, wherein the digital resource viewing application is a web browser.

37. The method of claim 35, wherein the first viewing area comprises a first defined area of a web browser window and wherein the second viewing area of the display comprises a second defined area of the web browser window.

38. A non-transitory computer-readable storage medium storing instruction for generating a visual array of digital resources, the instructions when executed by a processor causing the processor to perform steps including:

storing first parameters defining a first viewing area of a display and second parameters defining a second viewing area of a display;

storing identifiers for each of a first ordered set of digital resources and each of a second ordered set of digital resources;

storing a first data element associating each of the first ordered set of digital resources with the first viewing area;

storing a second data element associating each of the second ordered set of digital resources with the second viewing area;

causing the display to display a user interface element for generating the visual array;

detecting a selection of the user interface element;

responsive to the selection of the user interface element, identifying for inclusion in the visual array, at least a first digital resource from the first ordered set of digital resources and a second digital resource from the second ordered set of digital resources;

identifying the first data element corresponding to the first digital resource and determining that the first data element associates the first digital resource with the first viewing area;

responsive to determining that the first data element associates the first digital resource with the first viewing area, causing a first digital resource viewing component displaying the first digital resource to be positioned over the first viewing area of the display;

identifying the second data element corresponding to the second digital resource and determining that the second data element associates the second digital resource with the second viewing area; and

responsive to determining that the second data element associates the second digital resource with the second viewing area, causing a second digital resource viewing component displaying the second digital resource to be positioned over the second viewing area of the display.

39. The non-transitory computer-readable storage medium of claim 38, wherein causing the first digital resource viewing component displaying the first digital resource to be

positioned over the first viewing area of the display comprises generating the first digital resource viewing component and loading the first digital resource in the first digital resource viewing component, and wherein causing the second digital resource viewing component displaying the second digital resource to be positioned over the second viewing area of the display comprises generating the second digital resource viewing component and loading the second digital resource in the second digital resource viewing component.

40. The non-transitory computer-readable storage medium of claim 38, wherein the instructions when executed further cause the processor to perform steps including:

storing by the memory, an association between the first digital resource and second digital resource; and

wherein identifying the second digital resource for inclusion in the visual array comprises detecting the association between the first digital resource and second digital resource.

41. The non-transitory computer-readable storage medium of claim 40, wherein causing the second digital resource viewing component displaying the second digital resource to be positioned over the second viewing area of the display comprises:

detecting that the second digital resource viewing component is not present, generating the second digital resource viewing component, and loading the second digital resource in the second digital resource viewing component.

42. The non-transitory computer-readable storage medium of claim 38, wherein the first digital resource viewing component and the second digital resource viewing component comprise components of a same digital resource viewing application.

43. The non-transitory computer-readable storage medium of claim 42, wherein the digital resource viewing application is a web browser.

44. The non-transitory computer-readable storage medium of claim 42, wherein the first viewing area comprises a first defined area of a web browser window and wherein the second viewing area of the display comprises a second defined area of the web browser window.

45. The non-transitory computer-readable storage medium of claim 38, further comprising:

receiving, by the client device, an instruction to share the visual array;

sending, by the client device, identifying information for the first digital resource, parameters for the first viewing area, an association between the first digital resource with the first viewing area, identifying information for the second digital resource, parameters for the second viewing area, and an association between the second digital resource with the second viewing area to a remote server for accessing by another client device in the networked computer environment.

FIG. 1 1000

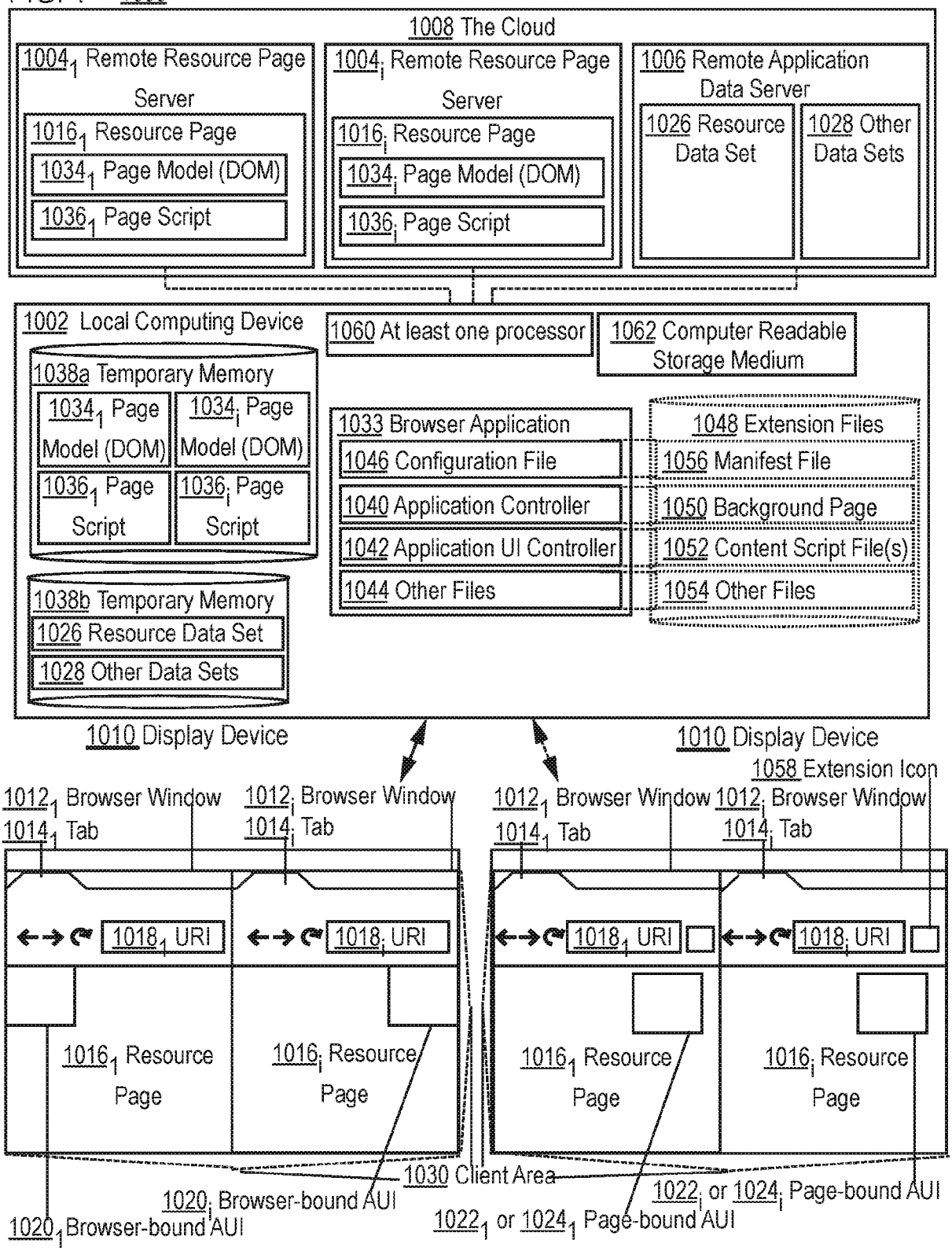

1008 The Cloud
1004$_1$ Remote Resource Page Server
1016$_1$ Resource Page
1034$_1$ Page Model (DOM)
1036$_1$ Page Script
1004$_i$ Remote Resource Page Server
1016$_i$ Resource Page
1034$_i$ Page Model (DOM)
1036$_i$ Page Script
1006 Remote Application Data Server
1026 Resource Data Set
1028 Other Data Sets
1002 Local Computing Device
1060 At least one processor
1062 Computer Readable Storage Medium
1038a Temporary Memory
1034$_1$ Page Model (DOM)
1034$_i$ Page Model (DOM)
1036$_1$ Page Script
1036$_i$ Page Script
1033 Browser Application
1046 Configuration File
1040 Application Controller
1042 Application UI Controller
1044 Other Files
1048 Extension Files
1056 Manifest File
1050 Background Page
1052 Content Script File(s)
1054 Other Files
1038b Temporary Memory
1026 Resource Data Set
1028 Other Data Sets
1010 Display Device
1010 Display Device
1058 Extension Icon
1012$_1$ Browser Window
1014$_1$ Tab
1012$_i$ Browser Window
1014$_i$ Tab
1018$_1$ URI
1018$_i$ URI
1016$_1$ Resource Page
1016$_i$ Resource Page
1030 Client Area
1020$_i$ Browser-bound AUI
1020$_1$ Browser-bound AUI
1022$_i$ or 1024$_i$ Page-bound AUI
1022$_1$ or 1024$_1$ Page-bound AUI

FIG. 2 1001

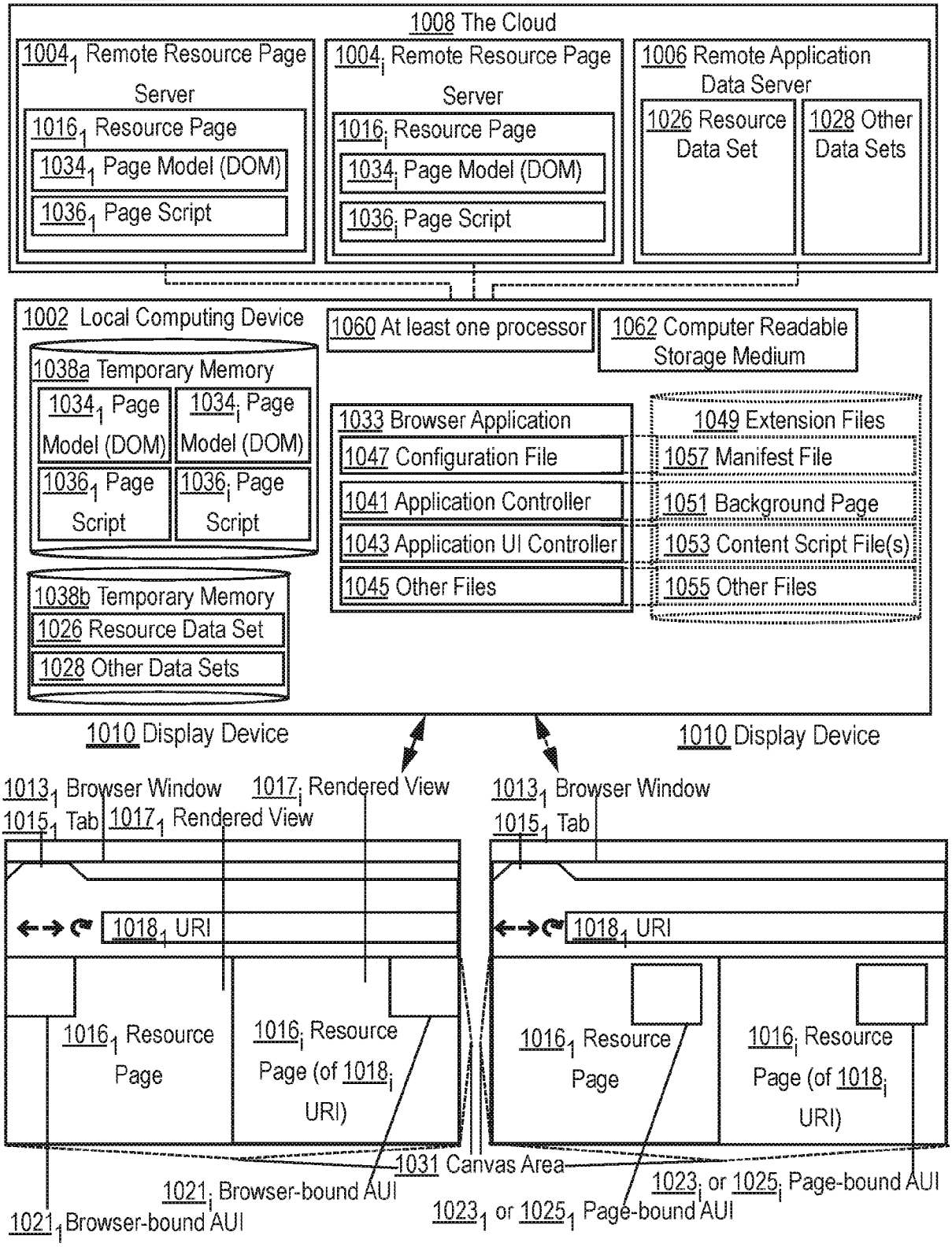

1008 The Cloud
1004$_1$ Remote Resource Page Server
1016$_1$ Resource Page
1034$_1$ Page Model (DOM)
1036$_1$ Page Script
1004$_i$ Remote Resource Page Server
1016$_i$ Resource Page
1034$_i$ Page Model (DOM)
1036$_i$ Page Script
1006 Remote Application Data Server
1026 Resource Data Set
1028 Other Data Sets
1002 Local Computing Device
1060 At least one processor
1062 Computer Readable Storage Medium
1038a Temporary Memory
1034$_1$ Page Model (DOM)
1034$_i$ Page Model (DOM)
1036$_1$ Page Script
1036$_i$ Page Script
1033 Browser Application
1047 Configuration File
1041 Application Controller
1043 Application UI Controller
1045 Other Files
1049 Extension Files
1057 Manifest File
1051 Background Page
1053 Content Script File(s)
1055 Other Files
1038b Temporary Memory
1026 Resource Data Set
1028 Other Data Sets
1010 Display Device
1010 Display Device
1013$_1$ Browser Window
1017$_i$ Rendered View
1015$_1$ Tab
1017$_1$ Rendered View
1018$_1$ URI
1016$_1$ Resource Page
1016$_i$ Resource Page (of 1018$_i$ URI)
1013$_1$ Browser Window
1015$_1$ Tab
1018$_1$ URI
1016$_1$ Resource Page
1016$_i$ Resource Page (of 1018$_i$ URI)
1031 Canvas Area
1021$_i$ Browser-bound AUI
1021$_1$ Browser-bound AUI
1023$_1$ or 1025$_1$ Page-bound AUI
1023$_i$ or 1025$_i$ Page-bound AUI

FIG. 3

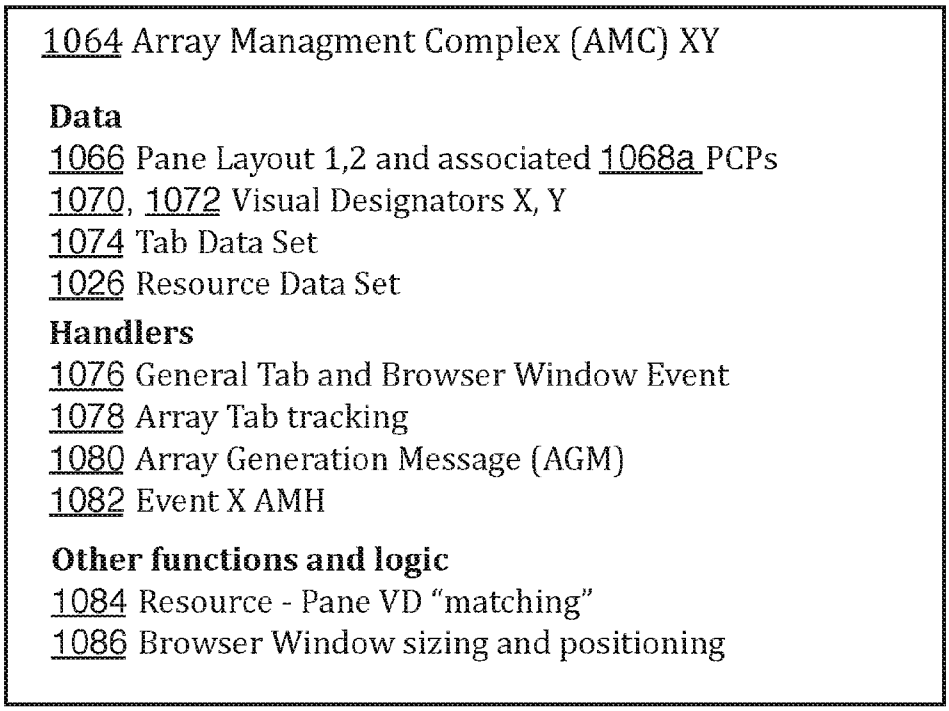

1064 Array Managment Complex (AMC) XY
Data
1066 Pane Layout 1,2 and associated 1068a PCPs
1070, 1072 Visual Designators X, Y
1074 Tab Data Set
1026 Resource Data Set
Handlers
1076 General Tab and Browser Window Event
1078 Array Tab tracking
1080 Array Generation Message (AGM)
1082 Event X AMH
Other functions and logic
1084 Resource - Pane VD "matching"
1086 Browser Window sizing and positioning

FIG. 4

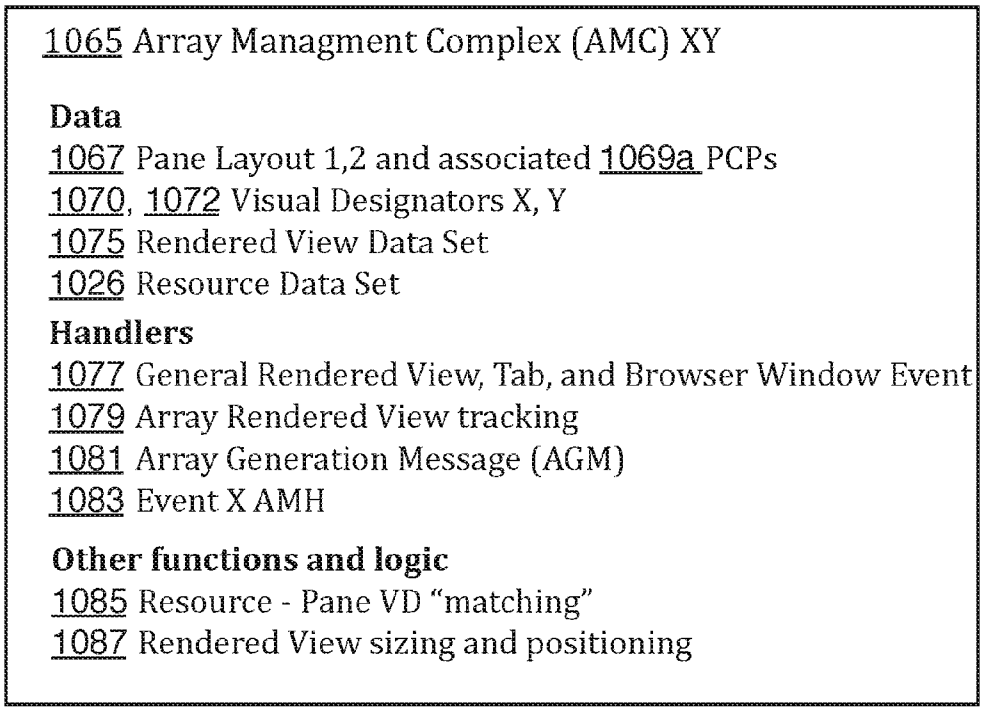

1065 Array Managment Complex (AMC) XY
Data
1067 Pane Layout 1,2 and associated 1069a PCPs
1070, 1072 Visual Designators X, Y
1075 Rendered View Data Set
1026 Resource Data Set
Handlers
1077 General Rendered View, Tab, and Browser Window Event
1079 Array Rendered View tracking
1081 Array Generation Message (AGM)
1083 Event X AMH
Other functions and logic
1085 Resource - Pane VD "matching"
1087 Rendered View sizing and positioning

FIG. 5

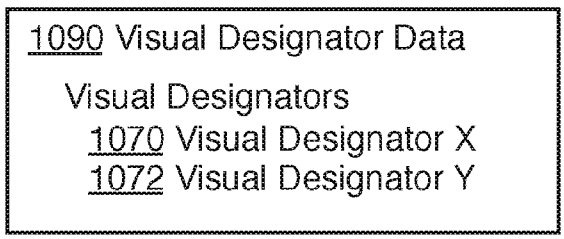

1090 Visual Designator Data
Visual Designators
1070 Visual Designator X
1072 Visual Designator Y

FIG. 6

1068a Pane Configuration Parameters (PCP)s and 1066 Pane Layout 1,2

	1092 Pane 1	1094 Pane 2
Position	(x1,y1)	(x2,y1)
Size		
Height	(y1,y2)	(y1,y2)
Width	(x1,x2)	(x2, x3)
Visual Designator	1070 VD X	1072 VD Y

FIG. 7

1069a Pane Configuration Parameters (PCP)s and 1067 Pane Layout 1,2

	1093 Pane 1	1095 Pane 2
Position	(x1,y1)	(x2,y1)
Size		
Height	(y1,y2)	(y1,y2)
Width	(x1,x2)	(x2, x3)
Visual Designator	1070 VD X	1072 VD Y

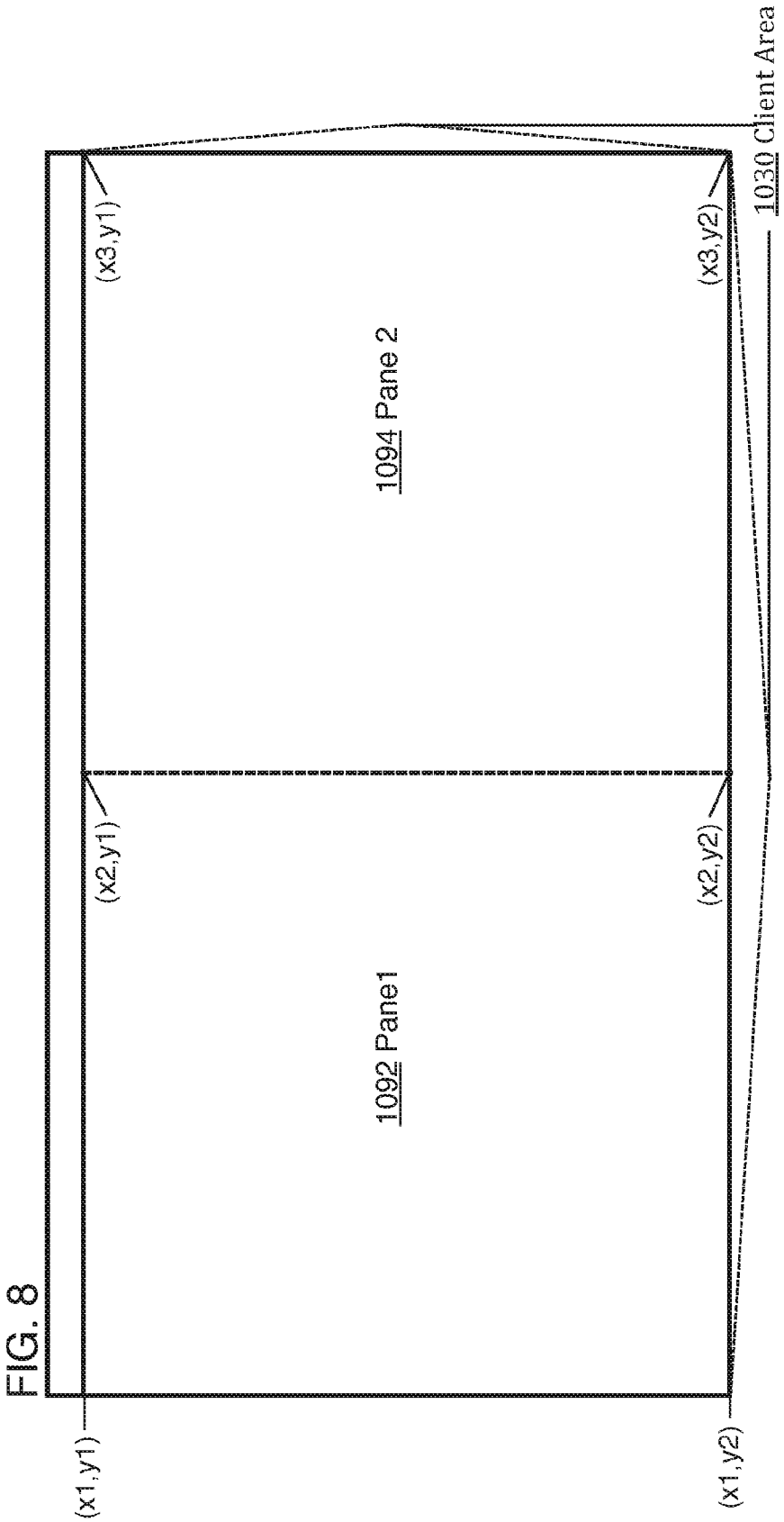

1030 Client Area
(x3,y1)
(x3,y2)
1094 Pane 2
(x2,y1)
(x2,y2)
1092 Pane1
(x1,y1)
(x1,y2)

FIG. 8

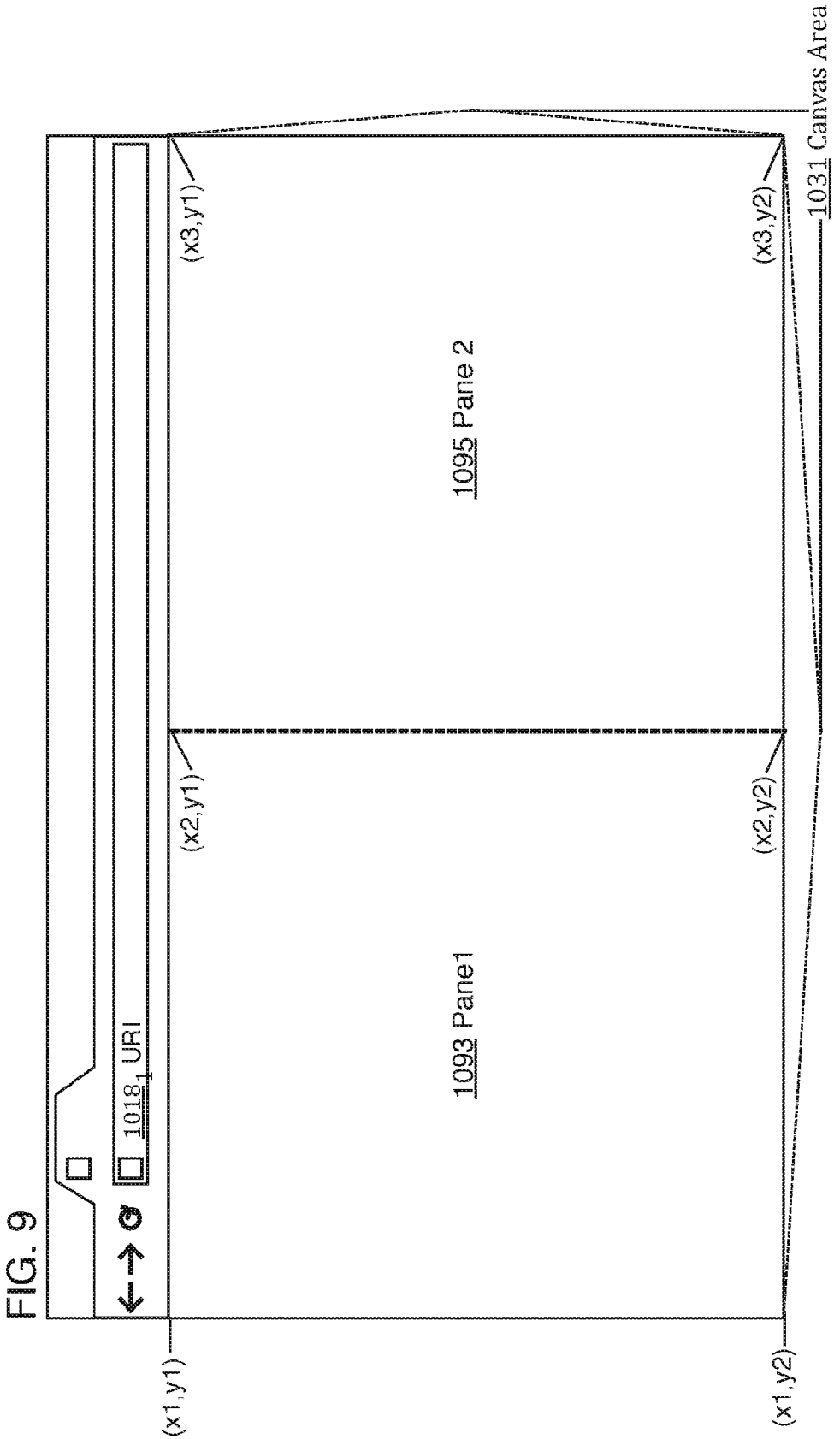
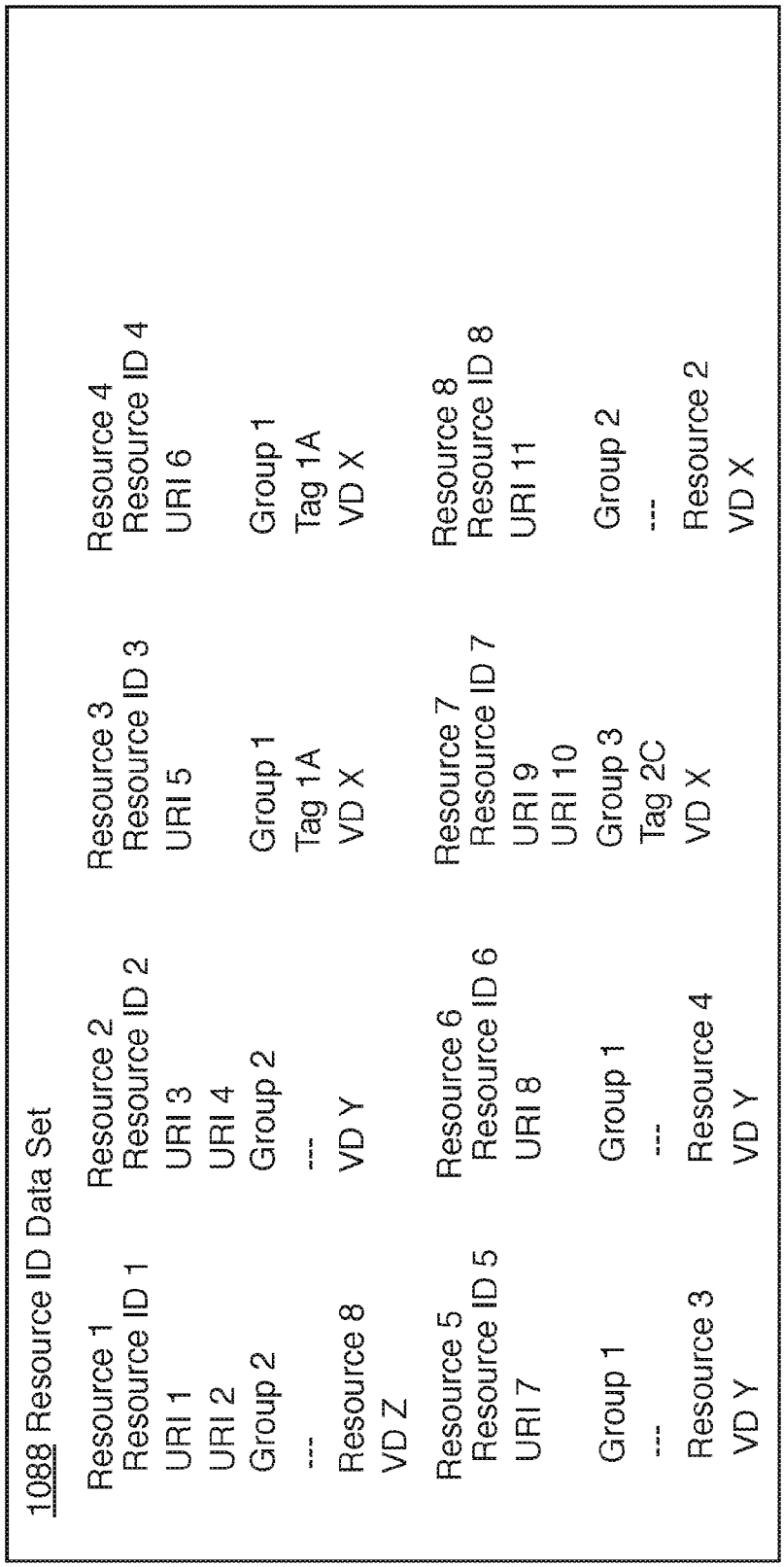

1031 Canvas Area
(x3,y1)
(x3,y2)
1095 Pane 2
(x2,y1)
(x2,y2)
1093 Pane1
1018_1 URI
(x1,y1)
(x1,y2)

FIG. 9

FIG. 10


1088 Resource ID Data Set
Resource 1
Resource ID 1
URI 1
URI 2
Group 2

Resource 8
VD Z
Resource 2
Resource ID 2
URI 3
URI 4
Group 2

VD Y
Resource 3
Resource ID 3
URI 5
Group 1
Tag 1A
VD X
Resource 4
Resource ID 4
URI 6
Group 1
Tag 1A
VD X
Resource 5
Resource ID 5
URI 7
Group 1

Resource 3
VD Y
Resource 6
Resource ID 6
URI 8
Group 1

Resource 4
VD Y
Resource 7
Resource ID 7
URI 9
URI 10
Group 3
Tag 2C
VD X
Resource 8
Resource ID 8
URI 11
Group 2

Resource 2
VD X

FIG. 11

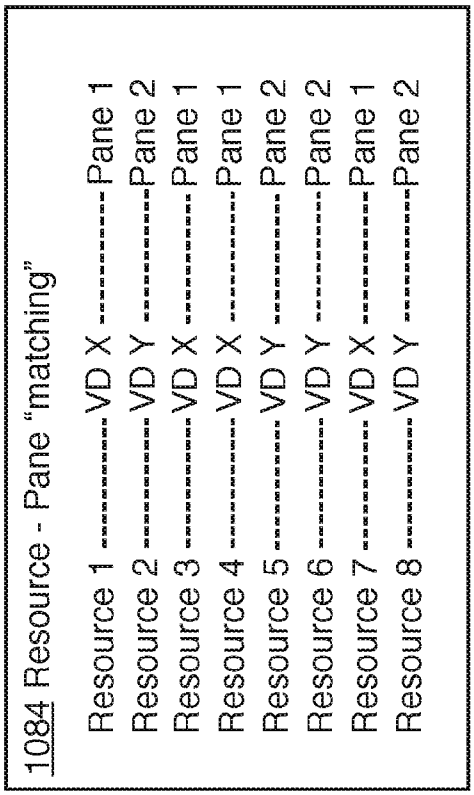

1084 Resource - Pane "matching"
Resource 1 ---------- VD X ---------- Pane 1
Resource 2 ---------- VD Y ---------- Pane 2
Resource 3 ---------- VD X ---------- Pane 1
Resource 4 ---------- VD X ---------- Pane 1
Resource 5 ---------- VD Y ---------- Pane 2
Resource 6 ---------- VD Y ---------- Pane 2
Resource 7 ---------- VD X ---------- Pane 1
Resource 8 ---------- VD Y ---------- Pane 2

FIG. 12

1074a **Tab Data Set**

Tab "1"	**Tab "2"**	**Tab "3"**	**Tab "4"**	**Tab "5"**	**Tab "6"**
Tab ID 1	Tab ID 2	Tab ID 3	Tab ID 4	Tab ID 5	Tab ID 6
Window ID 1	Window ID 2	Window ID 1	Window ID 1	Window ID 1	Window ID 1
Resource ID 1	Resource ID 2	google.com	Resource ID 4	Resource ID 12	yahoo.com
VD Z	VD Y	None	VD X	VD Y	None
Related Tab ID 2	Related Tab ID 1	None	None	Related Tab ID 8	None
Related Tab ID 9	Related Tab ID 9	None	None	None	None
AMC ID ZYX	AMC ID ZYX	TNAT	None	AMC ID XY	None

Tab "7"	**Tab "8"**	**Tab "9"**	**Tab "10"**	**Tab "11"**	**Tab "12"**
Tab ID 7	Tab ID 8	Tab ID 9	Tab ID 10	Tab ID 11	Tab ID 12
Window ID 1	Window ID 1	Window ID 2	Window ID 2	Window ID 2	Window ID 3
URI 33	Resource ID 20	Resource ID 8	Resource ID 8	Resource ID 21	Resource ID 7
None	VD X	VD X	VD X	VD Y	VD Z
None	Related Tab ID 5	Related Tab ID 1	None	Related Tab ID 13	None
None	None	Related Tab ID 2	None	None	None
None	AMC ID XY	AMC ID ZYX	TNAT ZYX	AMC ID YX	None

Tab "13"	**Tab "14"**	**Tab "15"**	**Tab "16"**
Tab ID 13	Tab ID 14	Tab ID 15	Tab ID 16
Window ID 4	Window ID 5	Window ID 6	Window ID 3
Resource ID 20	URI 41	google.com	Resource ID 6
VD X	None	None	VD Y
Related Tab ID 11	None	None	None
None	None	None	None
AMC ID YX	None	TNAT	None

FIG. 13

1074a **Tab Data Set**

Tab "1"	**Tab "2"**	**Tab "3"**	**Tab "4"**	**Tab "5"**	**Tab "6"**
Tab ID 1	Tab ID 2	Tab ID 3	Tab ID 4	Tab ID 5	Tab ID 6
Window ID 1	Window ID 2	Window ID 1	Window ID 1	Window ID 1	Window ID 1
Resource ID 1	Resource ID 2	Resource ID 3	Resource ID 4	Resource ID 12	yahoo.com
VD Z	VD Y	VD X	VD X	VD Y	None
Related Tab ID 2	Related Tab ID 1	None	None	Related Tab ID 8	None
Related Tab ID 9	Related Tab ID 9	None	None	None	None
AMC ID ZYX	AMC ID ZYX	None	None	AMC ID XY	None

Tab "7"	**Tab "8"**	**Tab "9"**	**Tab "10"**	**Tab "11"**	**Tab "12"**
Tab ID 7	Tab ID 8	Tab ID 9	Tab ID 10	Tab ID 11	Tab ID 12
Window ID 1	Window ID 1	Window ID 2	Window ID 2	Window ID 2	Window ID 3
URI 33	Resource ID 20	Resource ID 8	Resource ID 8	Resource ID 21	Resource ID 7
None	VD X	VD X	VD X	VD Y	VD Z
None	Related Tab ID 5	Related Tab ID 1	None	Related Tab ID 13	None
None	None	Related Tab ID 2	None	None	None
None	AMC ID XY	AMC ID ZYX	TNAT ZYX	AMC ID YX	None

Tab "13"	**Tab "14"**	**Tab "15"**	**Tab "16"**
Tab ID 13	Tab ID 14	Tab ID 15	Tab ID 16
Window ID 4	Window ID 5	Window ID 6	Window ID 3
Resource ID 20	URI 41	google.com	Resource ID 6
VD X	None	None	VD Y
Related Tab ID 11	None	None	None
None	None	None	None
AMC ID YX	None	TNAT	None

FIG. 14

1074a **Tab Data Set**

Tab "1"	**Tab "2"**	**Tab "3"**	**Tab "4"**	**Tab "5"**	**Tab "6"**
Tab ID 1	Tab ID 2	Tab ID 3	Tab ID 4	Tab ID 5	Tab ID 6
Window ID 1	Window ID 2	Window ID 1	Window ID 1	Window ID 1	Window ID 1
Resource ID 1	Resource ID 2	Resource ID 3	Resource ID 4	Resource ID 12	google.com
VD Z	VD Y	VD X	VD X	VD Y	None
Related Tab ID 2	Related Tab ID 1	Related Tab ID 15	None	Related Tab ID 8	None
Related Tab ID 9	Related Tab ID 9	None	None	None	None
AMC ID ZYX	AMC ID ZYX	AMC ID XY	None	AMC ID XY	None

Tab "7"	**Tab "8"**	**Tab "9"**	**Tab "10"**	**Tab "11"**	**Tab "12"**
Tab ID 7	Tab ID 8	Tab ID 9	Tab ID 10	Tab ID 11	Tab ID 12
Window ID 1	Window ID 1	Window ID 2	Window ID 2	Window ID 2	Window ID 3
URI 33	Resource ID 20	Resource ID 8	Resource ID 8	Resource ID 21	Resource ID 7
None	VD X	VD X	VD X	VD Y	VD Z
None	Related Tab ID 5	Related Tab ID 1	None	Related Tab ID 13	None
None	None	Related Tab ID 2	None	None	None
None	AMC ID XY	AMC ID ZYX	TNAT ZYX	AMC ID YX	None

Tab "13"	**Tab "14"**	**Tab "15"**	**Tab "16"**
Tab ID 13	Tab ID 14	Tab ID 15	Tab ID 16
Window ID 4	Window ID 5	Window ID 6	Window ID 3
Resource ID 20	URI 41	Resource ID 5	Resource ID 6
VD X	None	VD Y	VD Y
Related Tab ID 11	None	Related Tab ID 3	None
None	None	None	None
AMC ID YX	None	AMC ID XY	None

FIG. 15

1074a **Tab Data Set**

Tab "1"	**Tab "2"**	**Tab "3"**	**Tab "4"**	**Tab "5"**	**Tab "6"**
Tab ID 1	Tab ID 2	Tab ID 3	Tab ID 4	Tab ID 5	Tab ID 6
Window ID 1	Window ID 2	Window ID 1	Window ID 1	Window ID 1	Window ID 1
Resource ID 1	Resource ID 2	Resource ID 4	Resource ID 4	Resource ID 12	google.com
VD Z	VD Y	VD X	VD X	VD Y	None
Related Tab ID 2	Related Tab ID 1	Related Tab ID 15	None	Related Tab ID 8	None
Related Tab ID 9	Related Tab ID 9	None	None	None	None
AMC ID ZYX	AMC ID ZYX	AMC ID XY	TNAT XY	AMC ID XY	None
Tab "7"	**Tab "8"**	**Tab "9"**	**Tab "10"**	**Tab "11"**	**Tab "12"**
Tab ID 7	Tab ID 8	Tab ID 9	Tab ID 10	Tab ID 11	Tab ID 12
Window ID 1	Window ID 1	Window ID 2	Window ID 2	Window ID 2	Window ID 3
URI 33	Resource ID 20	Resource ID 8	Resource ID 8	**Resource ID 21**	Resource ID 7
None	VD X	VD X	VD X	VD Y	VD Z
None	Related Tab ID 5	Related Tab ID 1	None	Related Tab ID 13	None
None	None	Related Tab ID 2	None	None	None
None	AMC ID XY	AMC ID ZYX	TNAT ZYX	AMC ID YX	None
Tab "13"	**Tab "14"**	**Tab "15"**	**Tab "16"**		
Tab ID 13	Tab ID 14	Tab ID 15	Tab ID 16		
Window ID 4	Window ID 5	Window ID 6	Window ID 3		
Resource ID 20	URI 41	Resource ID 6	Resource ID 6		
VD X	None	VD Y	VD Y		
Related Tab ID 11	None	Related Tab ID 3	None		
None	None	None	None		
AMC ID YX	None	AMC ID XY	TNAT XY		

FIG. 16

1074a **Tab Data Set**

Tab "1"	**Tab "2"**	**Tab "3"**	**Tab "4"**	**Tab "5"**	**Tab "6"**
Tab ID 1	Tab ID 2	Tab ID 3	Tab ID 4	Tab ID 5	Tab ID 6
Window ID 1	Window ID 2	Window ID 1	Window ID 1	Window ID 1	Window ID 1
Resource ID 1	Resource ID 2	Resource ID 4	Resource ID 4	Resource ID 12	google.com
VD Z	VD Y	VD X	VD X	VD Y	None
Related Tab ID 2	Related Tab ID 1	Related Tab ID 16	None	Related Tab ID 8	None
Related Tab ID 9	Related Tab ID 9	None	None	None	None
AMC ID ZYX	AMC ID ZYX	AMC ID XY	TNAT XY	AMC ID XY	None

Tab "7"	**Tab "8"**	**Tab "9"**	**Tab "10"**	**Tab "11"**	**Tab "12"**
Tab ID 7	Tab ID 8	Tab ID 9	Tab ID 10	Tab ID 11	Tab ID 12
Window ID 1	Window ID 1	Window ID 2	Window ID 2	Window ID 2	Window ID 3
URI 33	Resource ID 20	Resource ID 8	Resource ID 8	Resource ID 21	Resource ID 7
None	VD X	VD X	VD X	VD Y	VD Z
None	Related Tab ID 5	Related Tab ID 1	None	Related Tab ID 13	None
None	None	Related Tab ID 2	None	None	None
None	AMC ID XY	AMC ID ZYX	TNAT ZYX	AMC ID YX	None

Tab "13"	**Tab "14"**	**Tab "16"**
Tab ID 13	Tab ID 14	Tab ID 16
Window ID 4	Window ID 5	Window ID 3
Resource ID 20	URI 41	Resource ID 6
VD X	None	VD Y
Related Tab ID 11	None	Related Tab ID 3
None	None	None
AMC ID YX	None	AMC ID XY

FIG. 17

1075a **Rendered View Data Set**

RV "1"	**RV "2"**	**RV "3"**	**RV "4"**	**RV "5"**	**RV "6"**
RV ID 1	RV ID 2	RV ID 3	RV ID 4	RV ID 5	RV ID 6
Tab ID 1	Tab ID 1	Tab ID 3	Tab ID 4	Tab ID 5	Tab ID 6
Window ID 1	Window ID 1	Window ID 1	Window ID 1	Window ID 1	Window ID 1
Resource ID 1	Resource ID 2	google.com	Resource ID 4	Resource ID 12	yahoo.com
VD Z	VD Y	None	VD X	VD Y	None
Related RV ID 2	Related RV 1	None	None	Related RV ID 8	None
Related RV ID 9	Related RV 9	None	None	None	None
AMC ID ZYX	AMC ID ZYX	TNARV	None	AMC ID XY	None
RV "7"	**RV "8"**	**RV "9"**	**RV "10"**	**RV "11"**	**RV "12"**
RV ID 7	RV ID 8	RV ID 9	RV ID 10	RV ID 11	RV ID 12
Tab ID 7	Tab ID 5	Tab ID 9	Tab ID 10	Tab ID 11	Tab ID 12
Window ID 1	Window ID 1	Window ID 2	Window ID 3	Window ID 4	Window ID 3
URI 33	Resource ID 20	Resource ID 8	Resource ID 8	Resource ID 21	Resource ID 7
None	VD X	VD X	VD X	VD Y	VD Z
None	Related RV 5	Related RV ID 1	None	Related RV ID 13	None
None	None	Related RV ID 2	None	None	None
None	AMC ID XY	AMC ID ZYX	TNARV ZYX	AMC ID YX	None
RV "13"	**RV "14"**	**RV "15"**	**RV "16"**		
RV ID 13	RV ID 14	RV ID 15	RV ID 16		
Tab ID 11	Tab ID 14	Tab ID 3	Tab ID 16		
Window ID 4	Window ID 5	Window ID 1	Window ID 3		
Resource ID 20	URI 41	bing.com	Resource ID 6		
VD X	None	None	VD Y		
Related RV ID 11	None	None	None		
None	None	None	None		
AMC ID YX	None	TNARV	None		

FIG. 18

1075a **Rendered View Data Set**

RV "1"	**RV "2"**	**RV "3"**	**RV "4"**	**RV "5"**	**RV "6"**
RV ID 1	RV ID 2	RV ID 3	RV ID 4	RV ID 5	RV ID 6
Tab ID 1	Tab ID 1	Tab ID 3	Tab ID 4	Tab ID 5	Tab ID 6
Window ID 1	Window ID 1	Window ID 1	Window ID 1	Window ID 1	Window ID 1
Resource ID 1	Resource ID 2	Resource ID 3	Resource ID 4	Resource ID 12	yahoo.com
VD Z	VD Y	None	VD X	VD Y	None
Related RV ID 2	Related RV 1	None	None	Related RV ID 8	None
Related RV ID 9	Related RV 9	None	None	None	None
AMC ID ZYX	AMC ID ZYX	None	None	AMC ID XY	None
RV "7"	**RV "8"**	**RV "9"**	**RV "10"**	**RV "11"**	**RV "12"**
RV ID 7	RV ID 8	RV ID 9	RV ID 10	RV ID 11	RV ID 12
Tab ID 7	Tab ID 5	Tab ID 9	Tab ID 10	Tab ID 11	Tab ID 12
Window ID 1	Window ID 1	Window ID 2	Window ID 3	Window ID 4	Window ID 3
URI 33	Resource ID 20	Resource ID 8	Resource ID 8	Resource ID 21	Resource ID 7
None	VD X	VD X	VD X	VD Y	VD Z
None	Related RV 5	Related RV ID 1	None	Related RV ID 13	None
None	None	Related RV ID 2	None	None	None
None	AMC ID XY	AMC ID ZYX	TNARV ZYX	AMC ID YX	None
RV "13"	**RV "14"**	**RV "15"**	**RV "16"**		
RV ID 13	RV ID 14	RV ID 15	RV ID 16		
Tab ID 11	Tab ID 14	Tab ID 3	Tab ID 16		
Window ID 4	Window ID 5	Window ID 1	Window ID 3		
Resource ID 20	URI 41	bing.com	Resource ID 6		
VD X	None	None	VD Y		
Related RV ID 11	None	None	None		
None	None	None	None		
AMC ID YX	None	TNARV	None		

FIG. 19

1075a **Rendered View Data Set**

RV "1"	**RV "2"**	**RV "3"**	**RV "4"**	**RV "5"**	**RV "6"**
RV ID 1	RV ID 2	RV ID 3	RV ID 4	RV ID 5	RV ID 6
Tab ID 1	Tab ID 1	Tab ID 3	Tab ID 4	Tab ID 5	Tab ID 6
Window ID 1	Window ID 1	Window ID 1	Window ID 1	Window ID 1	Window ID 1
Resource ID 1	Resource ID 2	Resource ID 3	Resource ID 4	Resource ID 12	yahoo.com
VD Z	VD Y	VD X	VD X	VD Y	None
Related RV ID 2	Related RV 1	Related RV ID 15	None	Related RV ID 8	None
Related RV ID 9	Related RV 9	None	None	None	None
AMC ID ZYX	AMC ID ZYX	AMC ID XY	None	AMC ID XY	None

RV "7"	**RV "8"**	**RV "9"**	**RV "10"**	**RV "11"**	**RV "12"**
RV ID 7	RV ID 8	RV ID 9	RV ID 10	RV ID 11	RV ID 12
Tab ID 7	Tab ID 5	Tab ID 9	Tab ID 10	Tab ID 11	Tab ID 12
Window ID 1	Window ID 1	Window ID 2	Window ID 3	Window ID 4	Window ID 3
URI 33	Resource ID 20	Resource ID 8	Resource ID 8	Resource ID 21	Resource ID 7
None	VD X	VD X	VD X	VD Y	VD Z
None	Related RV 5	Related RV ID 1	None	Related RV ID 13	None
None	None	Related RV ID 2	None	None	None
None	AMC ID XY	AMC ID ZYX	TNARV ZYX	AMC ID YX	None

RV "13"	**RV "14"**	**RV "15"**	**RV "16"**
RV ID 13	RV ID 14	RV ID 15	RV ID 16
Tab ID 11	Tab ID 14	Tab ID 3	Tab ID 16
Window ID 4	Window ID 5	Window ID 1	Window ID 3
Resource ID 20	URI 41	Resource ID 5	Resource ID 6
VD X	None	VD Y	VD Y
Related RV ID 11	None	Related RV ID 3	None
None	None	None	None
AMC ID YX	None	AMC ID XY	None

FIG. 20

1075a **Rendered View Data Set**

RV "1"	**RV "2"**	**RV "3"**	**RV "4"**	**RV "5"**	**RV "6"**
RV ID 1	RV ID 2	RV ID 3	RV ID 4	RV ID 5	RV ID 6
Tab ID 1	Tab ID 1	Tab ID 3	Tab ID 4	Tab ID 5	Tab ID 6
Window ID 1	Window ID 1	Window ID 1	Window ID 1	Window ID 1	Window ID 1
Resource ID 1	Resource ID 2	Resource ID 4	Resource ID 4	Resource ID 12	yahoo.com
VD Z	VD Y	VD X	VD X	VD Y	None
Related RV ID 2	Related RV 1	Related RV ID 15	None	Related RV ID 8	None
Related RV ID 9	Related RV 9	None	None	None	None
AMC ID ZYX	AMC ID ZYX	AMC ID XY	TNARV XY	AMC ID XY	None

RV "7"	**RV "8"**	**RV "9"**	**RV "10"**	**RV "11"**	**RV "12"**
RV ID 7	RV ID 8	RV ID 9	RV ID 10	RV ID 11	RV ID 12
Tab ID 7	Tab ID 5	Tab ID 9	Tab ID 10	Tab ID 11	Tab ID 12
Window ID 1	Window ID 1	Window ID 2	Window ID 3	Window ID 4	Window ID 3
URI 33	Resource ID 20	Resource ID 8	Resource ID 8	Resource ID 21	Resource ID 7
None	VD X	VD X	VD X	VD Y	VD Z
None	Related RV 5	Related RV ID 1	None	Related RV ID 13	None
None	None	Related RV ID 2	None	None	None
None	AMC ID XY	AMC ID ZYX	TNARV ZYX	AMC ID YX	None

RV "13"	**RV "14"**	**RV "15"**	**RV "16"**
RV ID 13	RV ID 14	RV ID 15	RV ID 16
Tab ID 11	Tab ID 14	Tab ID 3	Tab ID 16
Window ID 4	Window ID 5	Window ID 1	Window ID 3
Resource ID 20	URI 41	Resource ID 6	Resource ID 6
VD X	None	VD Y	VD Y
Related RV ID 11	None	Related RV ID 3	None
None	None	None	None
AMC ID YX	None	AMC ID XY	TNARV XY

FIG. 21

1075a **Rendered View Data Set**

RV "1"	**RV "2"**	**RV "3"**	**RV "4"**	**RV "5"**	**RV "6"**
RV ID 1	RV ID 2	RV ID 3	RV ID 4	RV ID 5	RV ID 6
Tab ID 1	Tab ID 1	Tab ID 3	Tab ID 4	Tab ID 5	Tab ID 6
Window ID 1	Window ID 1	Window ID 1	Window ID 1	Window ID 1	Window ID 1
Resource ID 1	Resource ID 2	Resource ID 4	Resource ID 4	Resource ID 12	yahoo.com
VD Z	VD Y	VD X	VD X	VD Y	None
Related RV ID 2	Related RV 1	Related RV ID 16	None	Related RV ID 8	None
Related RV ID 9	Related RV 9	None	None	None	None
AMC ID ZYX	AMC ID ZYX	AMC ID XY	TNARV XY	AMC ID XY	None
RV "7"	**RV "8"**	**RV "9"**	**RV "10"**	**RV "11"**	**RV "12"**
RV ID 7	RV ID 8	RV ID 9	RV ID 10	RV ID 11	RV ID 12
Tab ID 7	Tab ID 5	Tab ID 9	Tab ID 10	Tab ID 11	Tab ID 12
Window ID 1	Window ID 1	Window ID 2	Window ID 3	Window ID 4	Window ID 3
URI 33	Resource ID 20	Resource ID 8	Resource ID 8	Resource ID 21	Resource ID 7
None	VD X	VD X	VD X	VD Y	VD Z
None	Related RV 5	Related RV ID 1	None	Related RV ID 13	None
None	None	Related RV ID 2	None	None	None
None	AMC ID XY	AMC ID ZYX	TNARV ZYX	AMC ID YX	None
RV "13"	**RV "14"**		**RV "16"**		
RV ID 13	RV ID 14		RV ID 16		
Tab ID 11	Tab ID 14		Tab ID 16		
Window ID 4	Window ID 5		Window ID 3		
Resource ID 20	URI 41		Resource ID 6		
VD X	None		VD Y		
Related RV ID 11	None		Related RV ID 3		
None	None		None		
AMC ID YX	None		AMC ID XY		

FIG. 22

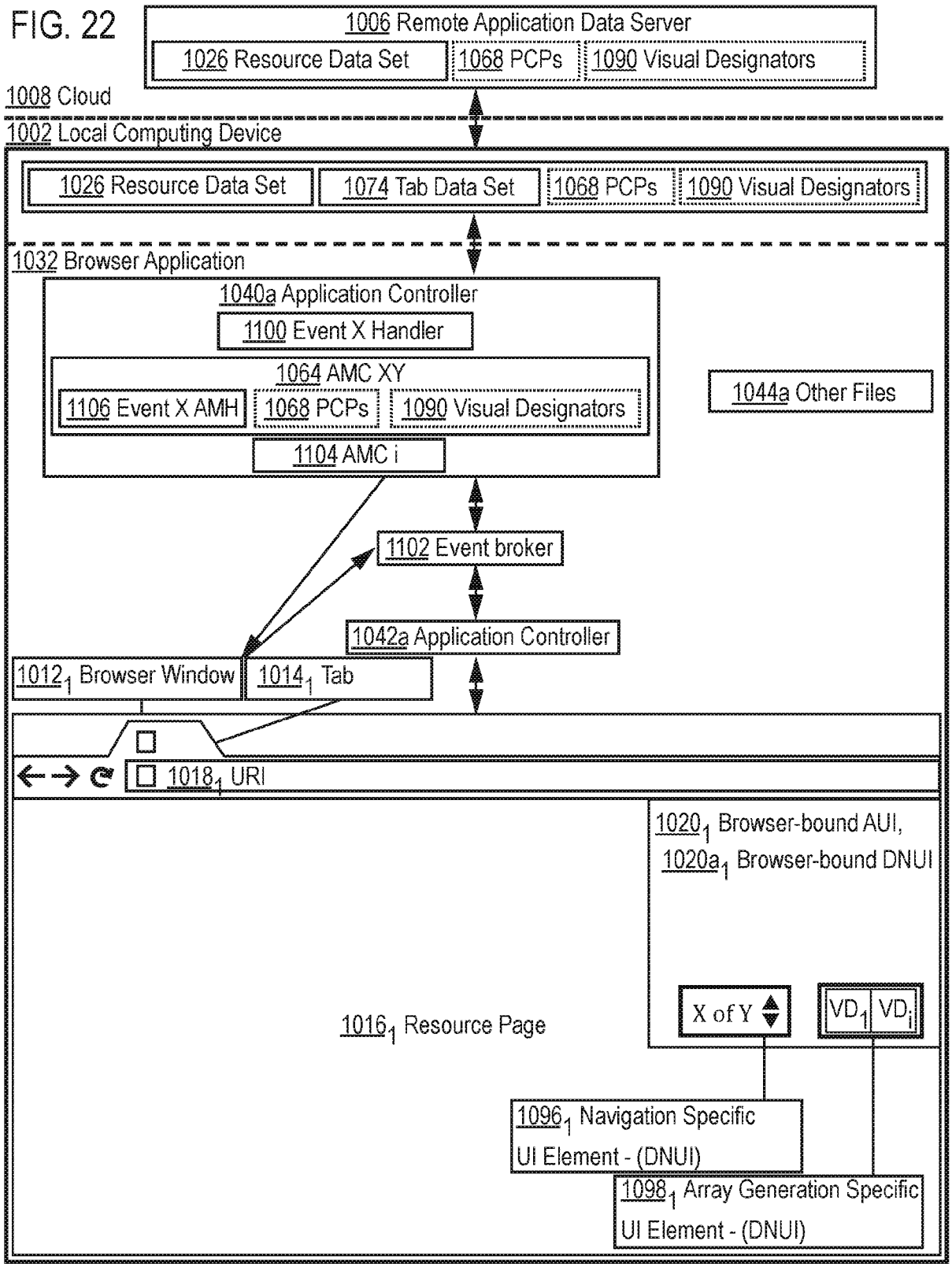

1006 Remote Application Data Server
1026 Resource Data Set
1068 PCPs
1090 Visual Designators
1008 Cloud
1002 Local Computing Device
1026 Resource Data Set
1074 Tab Data Set
1068 PCPs
1090 Visual Designators
1032 Browser Application
1040a Application Controller
1100 Event X Handler
1064 AMC XY
1106 Event X AMH
1068 PCPs
1090 Visual Designators
1104 AMC i
1044a Other Files
1102 Event broker
1042a Application Controller
1012$_1$ Browser Window
1014$_1$ Tab
1018$_1$ URI
1020$_1$ Browser-bound AUI,
1020a$_1$ Browser-bound DNUI
X of Y
VD$_1$ VD$_i$
1016$_1$ Resource Page
1096$_1$ Navigation Specific UI Element - (DNUI)
1098$_1$ Array Generation Specific UI Element - (DNUI)

FIG. 23

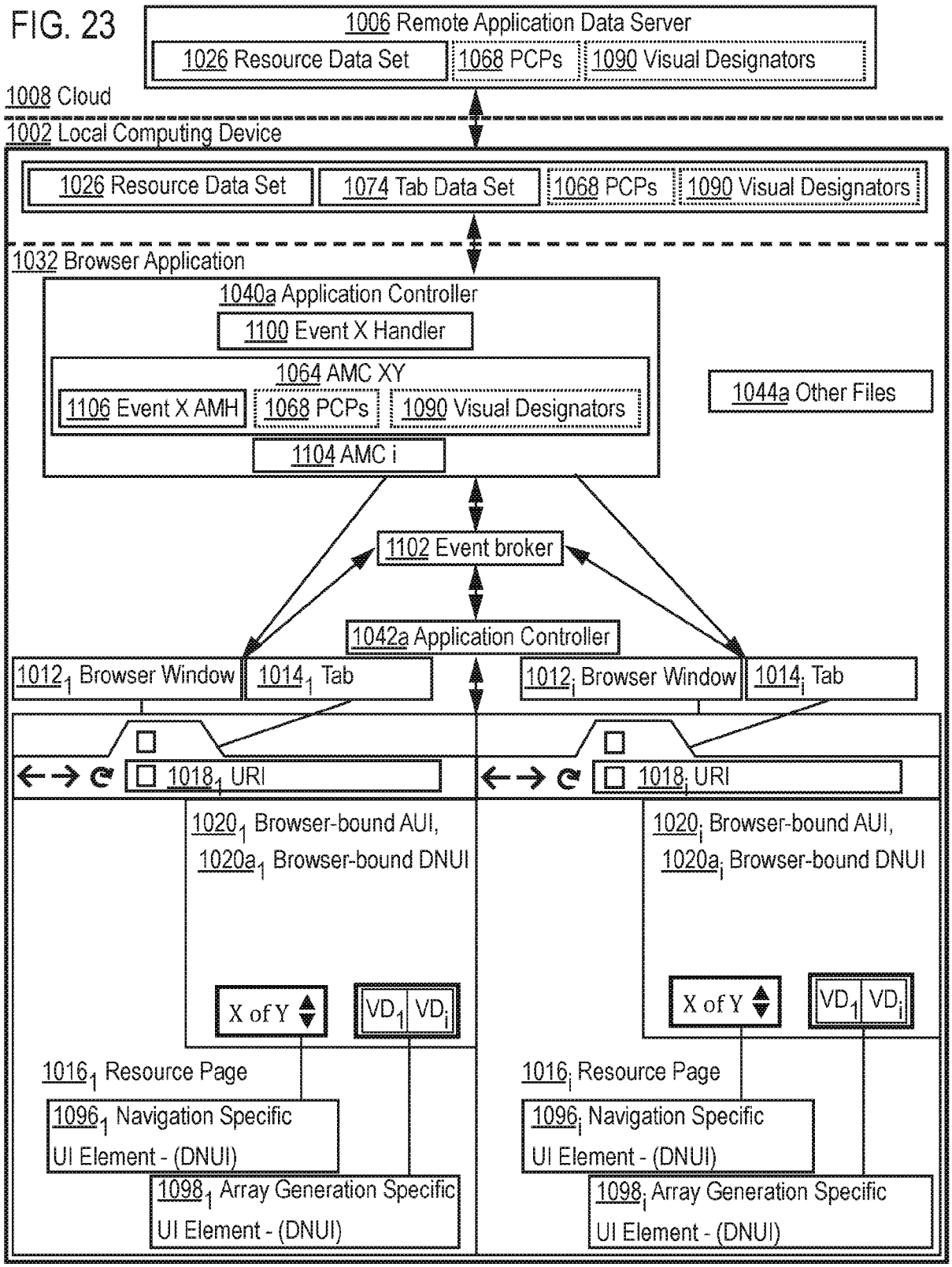

1006 Remote Application Data Server
1026 Resource Data Set
1068 PCPs
1090 Visual Designators
1008 Cloud
1002 Local Computing Device
1026 Resource Data Set
1074 Tab Data Set
1068 PCPs
1090 Visual Designators
1032 Browser Application
1040a Application Controller
1100 Event X Handler
1064 AMC XY
1106 Event X AMH
1068 PCPs
1090 Visual Designators
1104 AMC i
1044a Other Files
1102 Event broker
1042a Application Controller
1012₁ Browser Window
1014₁ Tab
1012ᵢ Browser Window
1014ᵢ Tab
1018₁ URI
1018ᵢ URI
1020₁ Browser-bound AUI,
1020a₁ Browser-bound DNUI
1020ᵢ Browser-bound AUI,
1020aᵢ Browser-bound DNUI
X of Y
VD₁ VDᵢ
X of Y
VD₁ VDᵢ
1016₁ Resource Page
1096₁ Navigation Specific
UI Element - (DNUI)
1098₁ Array Generation Specific
UI Element - (DNUI)
1016ᵢ Resource Page
1096ᵢ Navigation Specific
UI Element - (DNUI)
1098ᵢ Array Generation Specific
UI Element - (DNUI)

FIG. 24

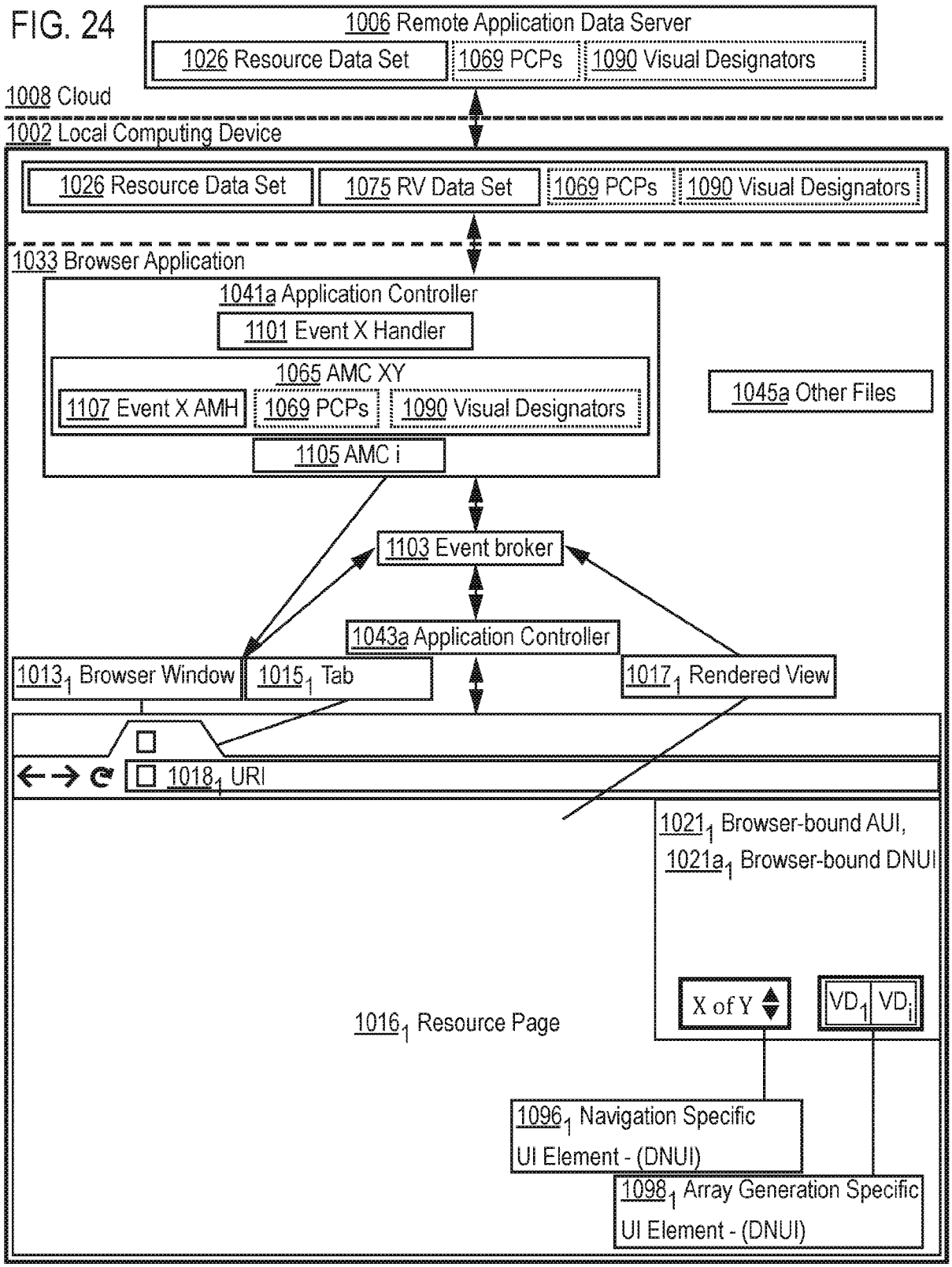

1006 Remote Application Data Server
1026 Resource Data Set
1069 PCPs
1090 Visual Designators
1008 Cloud
1002 Local Computing Device
1026 Resource Data Set
1075 RV Data Set
1069 PCPs
1090 Visual Designators
1033 Browser Application
1041a Application Controller
1101 Event X Handler
1065 AMC XY
1107 Event X AMH
1069 PCPs
1090 Visual Designators
1105 AMC i
1045a Other Files
1103 Event broker
1043a Application Controller
1013$_1$ Browser Window
1015$_1$ Tab
1017$_1$ Rendered View
1018$_1$ URI
1021$_1$ Browser-bound AUI,
1021a$_1$ Browser-bound DNUI
X of Y
VD$_1$ VD$_i$
1016$_1$ Resource Page
1096$_1$ Navigation Specific UI Element - (DNUI)
1098$_1$ Array Generation Specific UI Element - (DNUI)

FIG. 25

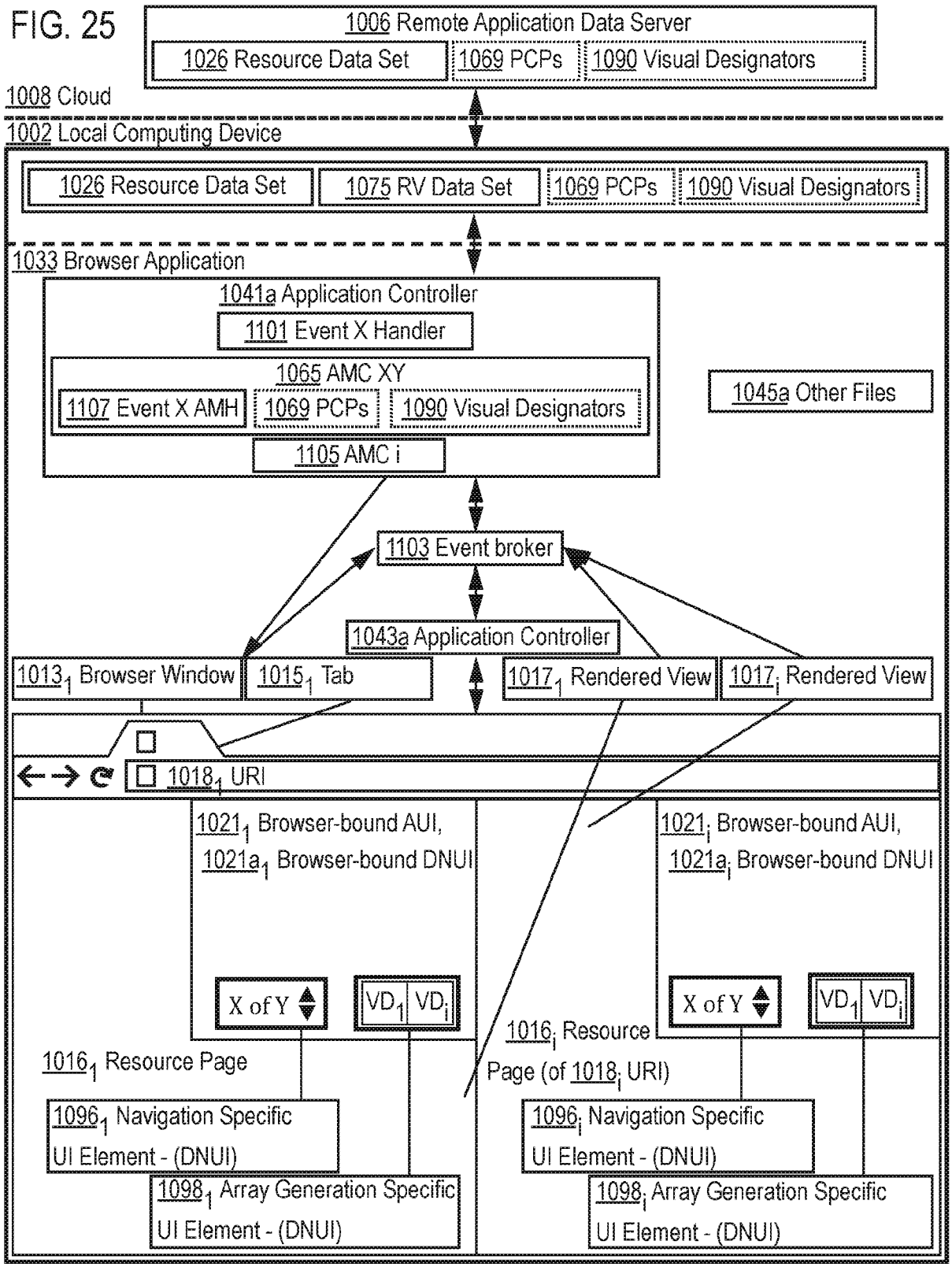

1006 Remote Application Data Server
1026 Resource Data Set
1069 PCPs
1090 Visual Designators
1008 Cloud
1002 Local Computing Device
1026 Resource Data Set
1075 RV Data Set
1069 PCPs
1090 Visual Designators
1033 Browser Application
1041a Application Controller
1101 Event X Handler
1065 AMC XY
1107 Event X AMH
1069 PCPs
1090 Visual Designators
1105 AMC i
1045a Other Files
1103 Event broker
1043a Application Controller
1013$_1$ Browser Window
1015$_1$ Tab
1017$_1$ Rendered View
1017$_i$ Rendered View
1018$_1$ URI
1021$_1$ Browser-bound AUI,
1021a$_1$ Browser-bound DNUI
1021$_i$ Browser-bound AUI,
1021a$_i$ Browser-bound DNUI
X of Y
VD$_1$ VD$_i$
X of Y
VD$_1$ VD$_i$
1016$_1$ Resource Page
1016$_i$ Resource Page (of 1018$_i$ URI)
1096$_1$ Navigation Specific UI Element - (DNUI)
1098$_1$ Array Generation Specific UI Element - (DNUI)
1096$_i$ Navigation Specific UI Element - (DNUI)
1098$_i$ Array Generation Specific UI Element - (DNUI)

FIG. 26

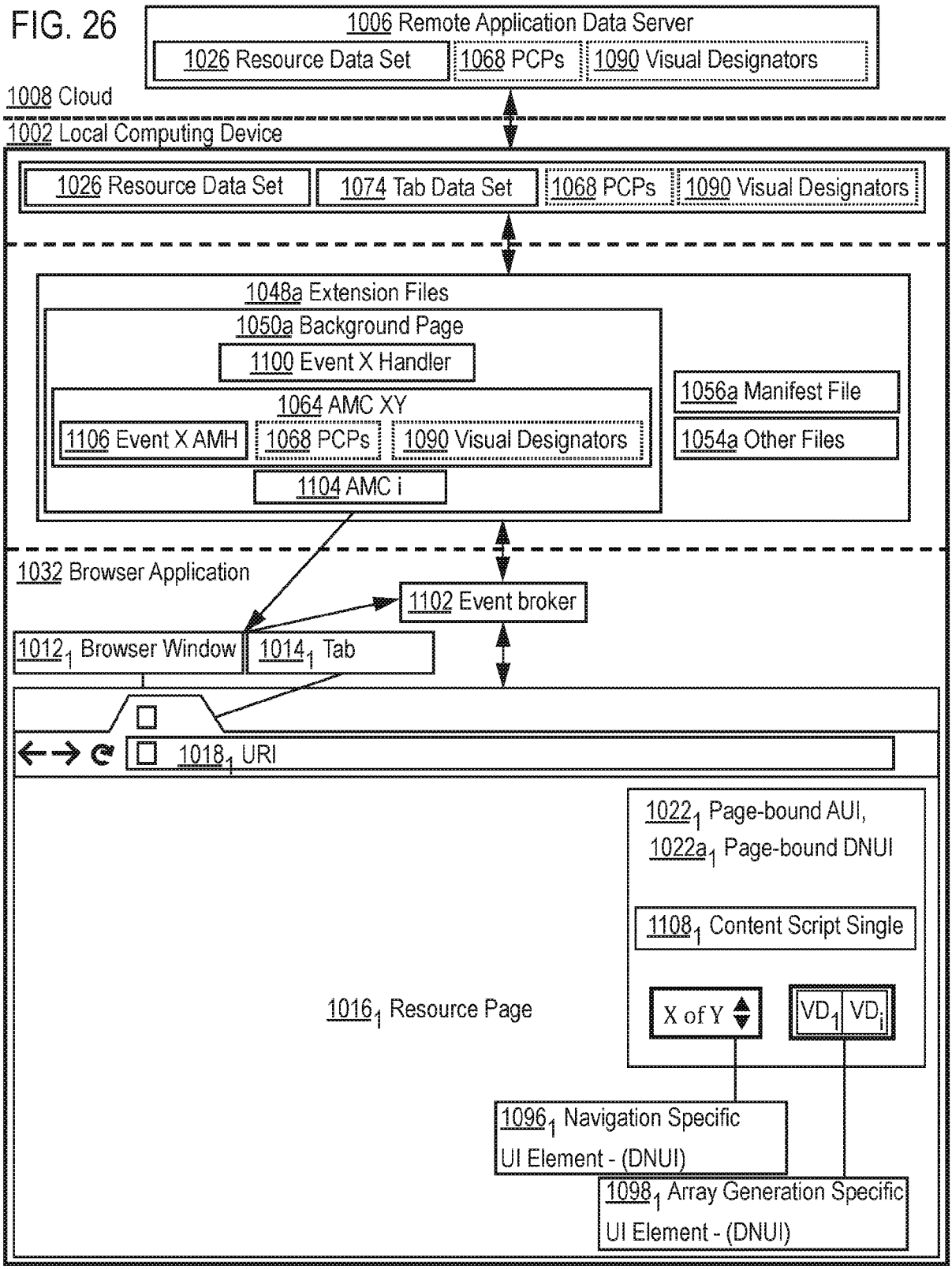

1006 Remote Application Data Server
1026 Resource Data Set
1068 PCPs
1090 Visual Designators
1008 Cloud
1002 Local Computing Device
1026 Resource Data Set
1074 Tab Data Set
1068 PCPs
1090 Visual Designators
1048a Extension Files
1050a Background Page
1100 Event X Handler
1064 AMC XY
1106 Event X AMH
1068 PCPs
1090 Visual Designators
1104 AMC i
1056a Manifest File
1054a Other Files
1032 Browser Application
1102 Event broker
1012$_1$ Browser Window
1014$_1$ Tab
1018$_1$ URI
1022$_1$ Page-bound AUI,
1022a$_1$ Page-bound DNUI
1108$_1$ Content Script Single
1016$_1$ Resource Page
X of Y
VD$_1$ VD$_i$
1096$_1$ Navigation Specific
UI Element - (DNUI)
1098$_1$ Array Generation Specific
UI Element - (DNUI)

FIG. 27

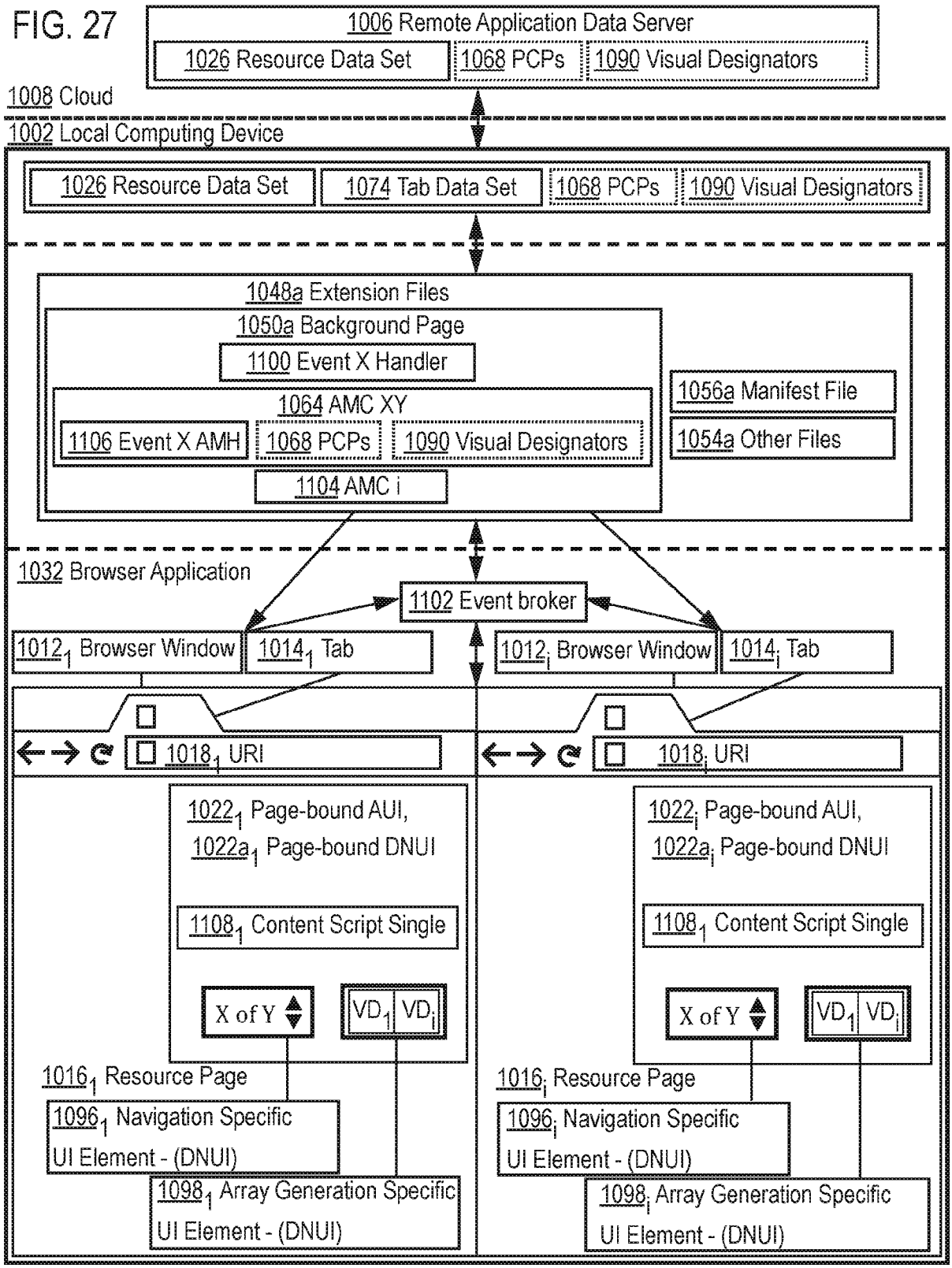

1006 Remote Application Data Server
1026 Resource Data Set
1068 PCPs
1090 Visual Designators
1008 Cloud
1002 Local Computing Device
1026 Resource Data Set
1074 Tab Data Set
1068 PCPs
1090 Visual Designators
1048a Extension Files
1050a Background Page
1100 Event X Handler
1064 AMC XY
1106 Event X AMH
1068 PCPs
1090 Visual Designators
1104 AMC i
1056a Manifest File
1054a Other Files
1032 Browser Application
1102 Event broker
1012$_1$ Browser Window
1014$_1$ Tab
1012$_i$ Browser Window
1014$_i$ Tab
1018$_1$ URI
1018$_i$ URI
1022$_1$ Page-bound AUI,
1022a$_1$ Page-bound DNUI
1108$_1$ Content Script Single
X of Y
VD$_1$ VD$_i$
1016$_1$ Resource Page
1096$_1$ Navigation Specific UI Element - (DNUI)
1098$_1$ Array Generation Specific UI Element - (DNUI)
1022$_i$ Page-bound AUI,
1022a$_i$ Page-bound DNUI
1108$_1$ Content Script Single
X of Y
VD$_1$ VD$_i$
1016$_i$ Resource Page
1096$_i$ Navigation Specific UI Element - (DNUI)
1098$_i$ Array Generation Specific UI Element - (DNUI)

FIG. 28

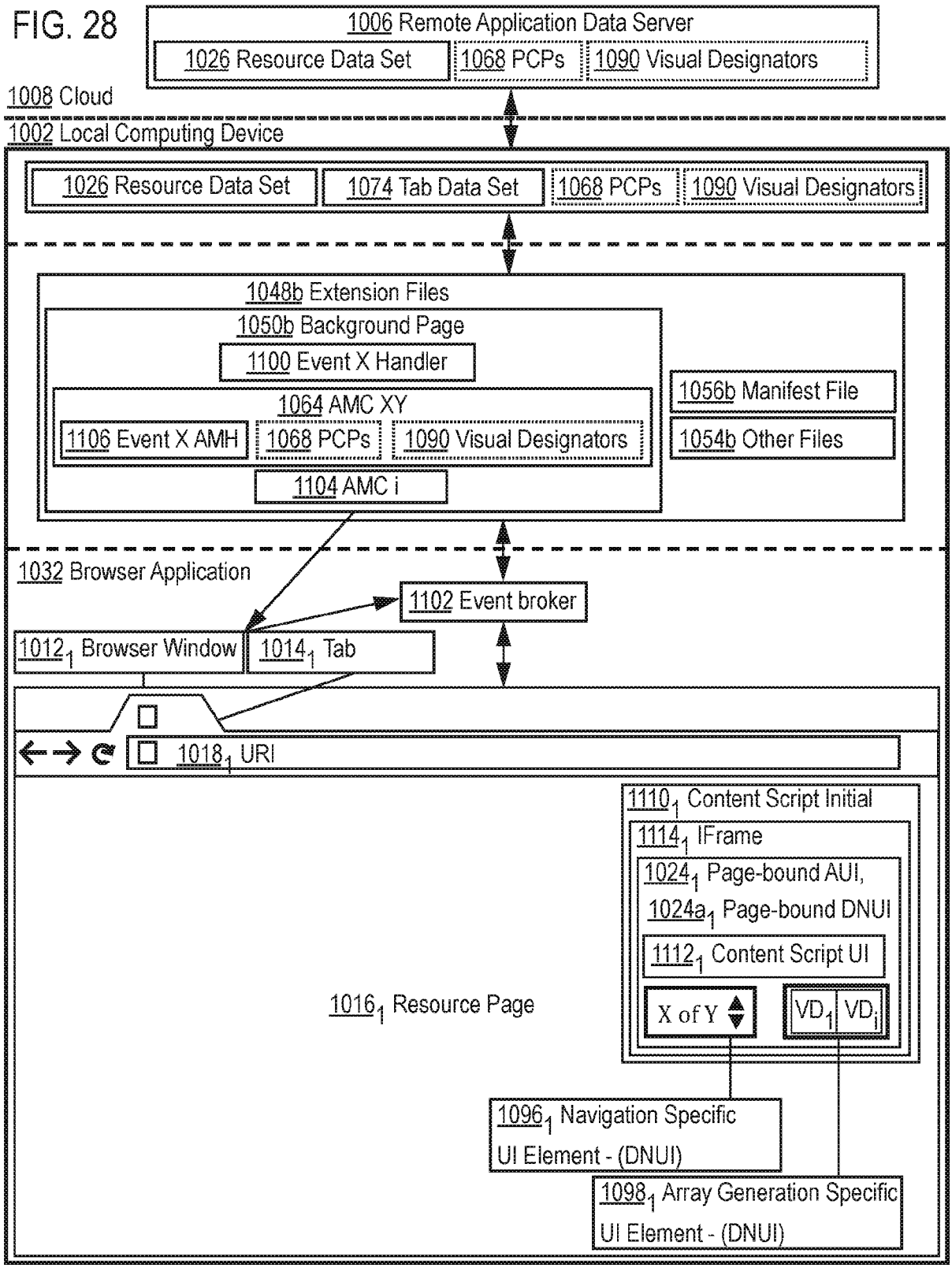

1006 Remote Application Data Server
1026 Resource Data Set
1068 PCPs
1090 Visual Designators
1008 Cloud
1002 Local Computing Device
1026 Resource Data Set
1074 Tab Data Set
1068 PCPs
1090 Visual Designators
1048b Extension Files
1050b Background Page
1100 Event X Handler
1064 AMC XY
1106 Event X AMH
1068 PCPs
1090 Visual Designators
1104 AMC i
1056b Manifest File
1054b Other Files
1032 Browser Application
1102 Event broker
1012$_1$ Browser Window
1014$_1$ Tab
1018$_1$ URI
1110$_1$ Content Script Initial
1114$_1$ IFrame
1024$_1$ Page-bound AUI,
1024a$_1$ Page-bound DNUI
1112$_1$ Content Script UI
X of Y
VD$_1$ VD$_i$
1016$_1$ Resource Page
1096$_1$ Navigation Specific UI Element - (DNUI)
1098$_1$ Array Generation Specific UI Element - (DNUI)

FIG. 29

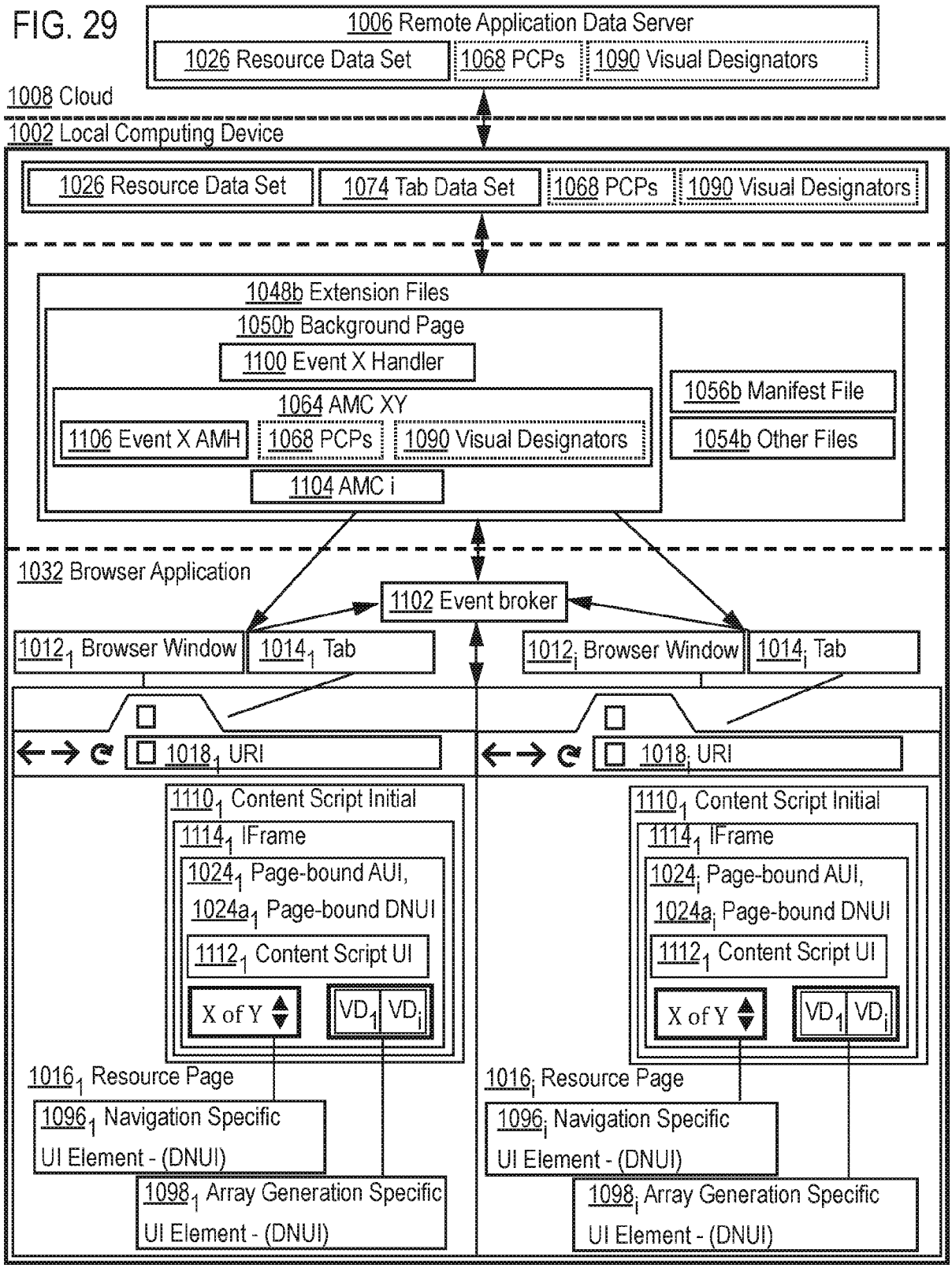
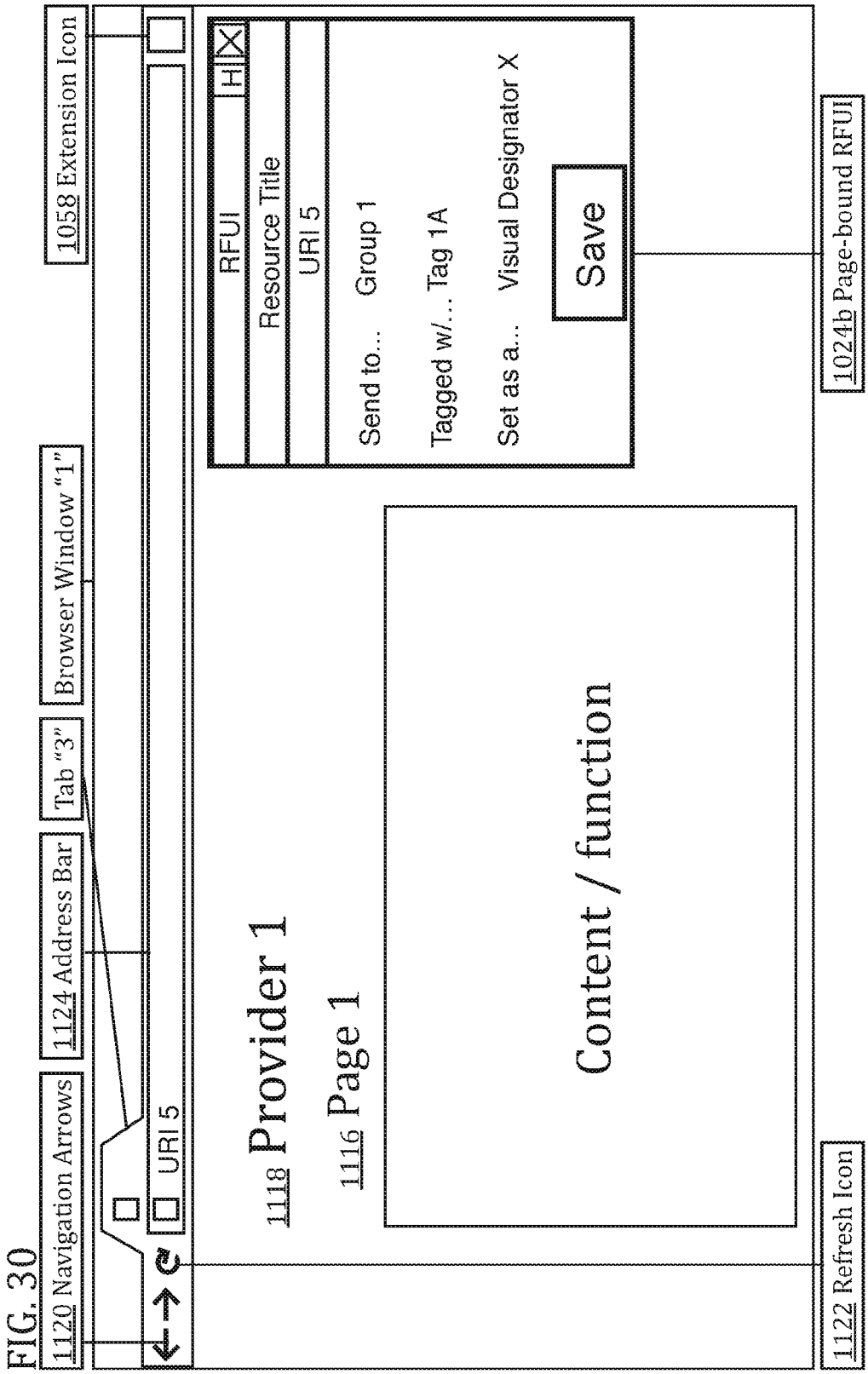

1006 Remote Application Data Server
1026 Resource Data Set
1068 PCPs
1090 Visual Designators
1008 Cloud
1002 Local Computing Device
1026 Resource Data Set
1074 Tab Data Set
1068 PCPs
1090 Visual Designators
1048b Extension Files
1050b Background Page
1100 Event X Handler
1064 AMC XY
1106 Event X AMH
1068 PCPs
1090 Visual Designators
1104 AMC i
1056b Manifest File
1054b Other Files
1032 Browser Application
1102 Event broker
1012$_1$ Browser Window
1014$_1$ Tab
1012$_i$ Browser Window
1014$_i$ Tab
1018$_1$ URI
1018$_i$ URI
1110$_1$ Content Script Initial
1114$_1$ IFrame
1024$_1$ Page-bound AUI,
1024a$_1$ Page-bound DNUI
1112$_1$ Content Script UI
X of Y
VD$_1$ VD$_i$
1016$_1$ Resource Page
1096$_1$ Navigation Specific UI Element - (DNUI)
1098$_1$ Array Generation Specific UI Element - (DNUI)
1110$_1$ Content Script Initial
1114$_1$ IFrame
1024$_i$ Page-bound AUI,
1024a$_i$ Page-bound DNUI
1112$_1$ Content Script UI
X of Y
VD$_1$ VD$_i$
1016$_i$ Resource Page
1096$_i$ Navigation Specific UI Element - (DNUI)
1098$_i$ Array Generation Specific UI Element - (DNUI)

FIG. 30


1120 Navigation Arrows
1124 Address Bar
Tab "3"
Browser Window "1"
1058 Extension Icon
URI 5
1118 Provider 1
1116 Page 1
Content / function
RFUI
HI
Resource Title
URI 5
Send to... Group 1
Tagged w/... Tag 1A
Set as a... Visual Designator X
Save
1024b Page-bound RFUI
1122 Refresh Icon

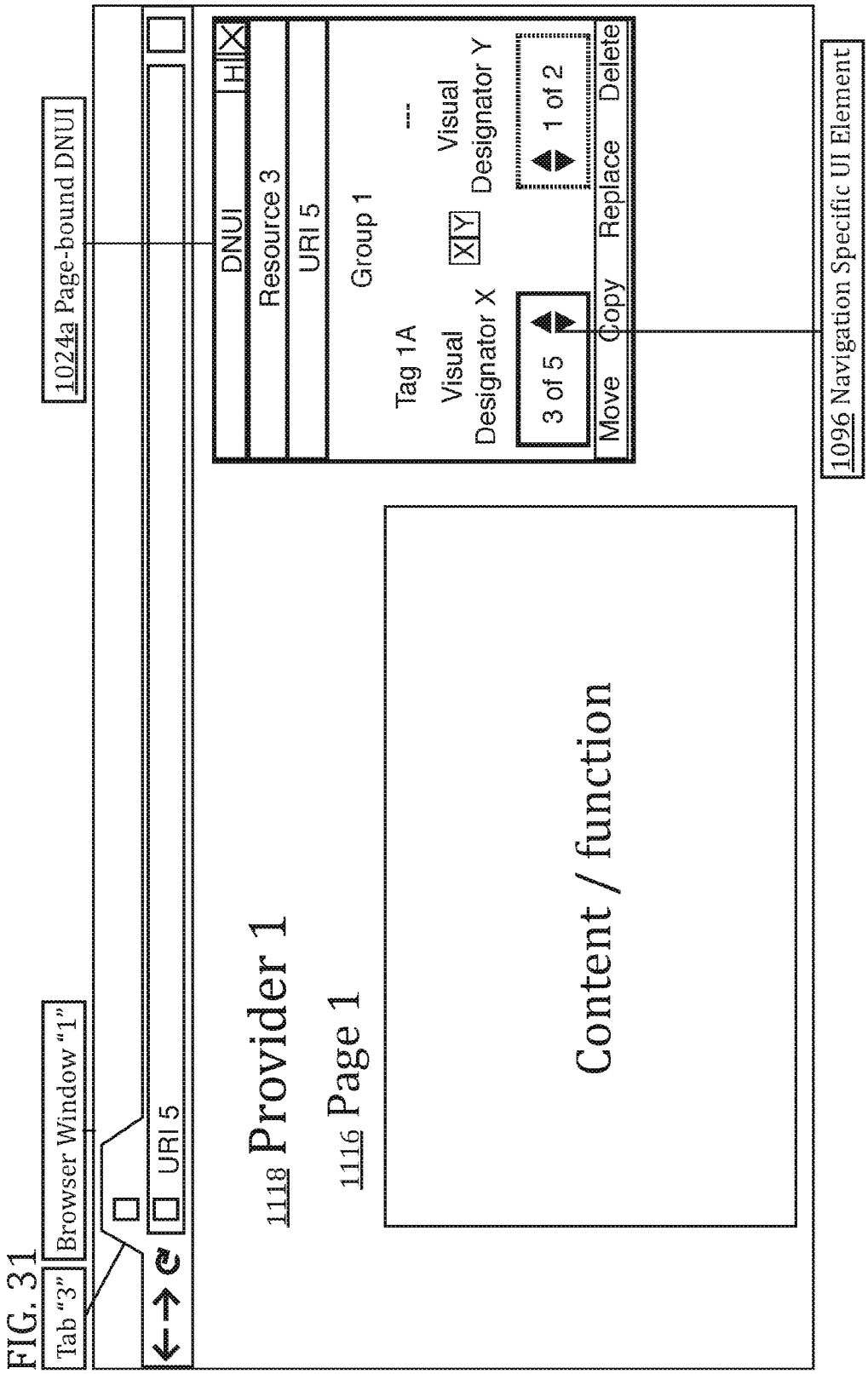

Tab "3"
Browser Window "1"
URI 5
1024a Page-bound DNUI
1118 Provider 1
1116 Page 1
Content / function
DNUI
H
Resource 3
URI 5
Group 1
Tag 1A
Visual Designator X
XY
Visual Designator Y
3 of 5
1 of 2
Move
Copy
Replace
Delete
1096 Navigation Specific UI Element

FIG. 31

FIG. 32

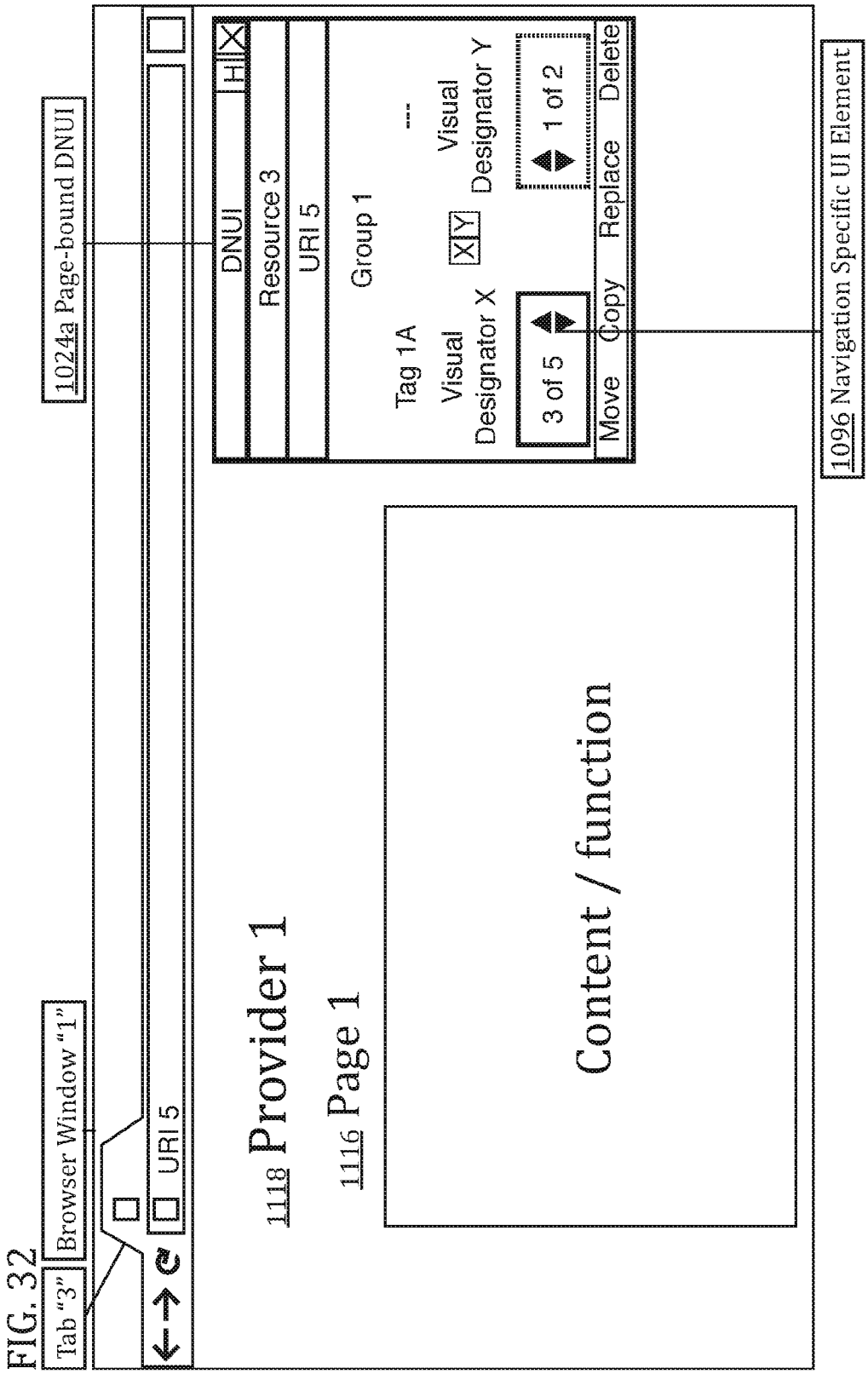

Tab "3"
Browser Window "1"
URI 5
1024a Page-bound DNUI
1118 Provider 1
1116 Page 1
Content / function
DNUI
Resource 3
URI 5
Group 1
Tag 1A
Visual Designator X
XY
Visual Designator Y
3 of 5
1 of 2
Move
Copy
Replace
Delete
1096 Navigation Specific UI Element

FIG. 33

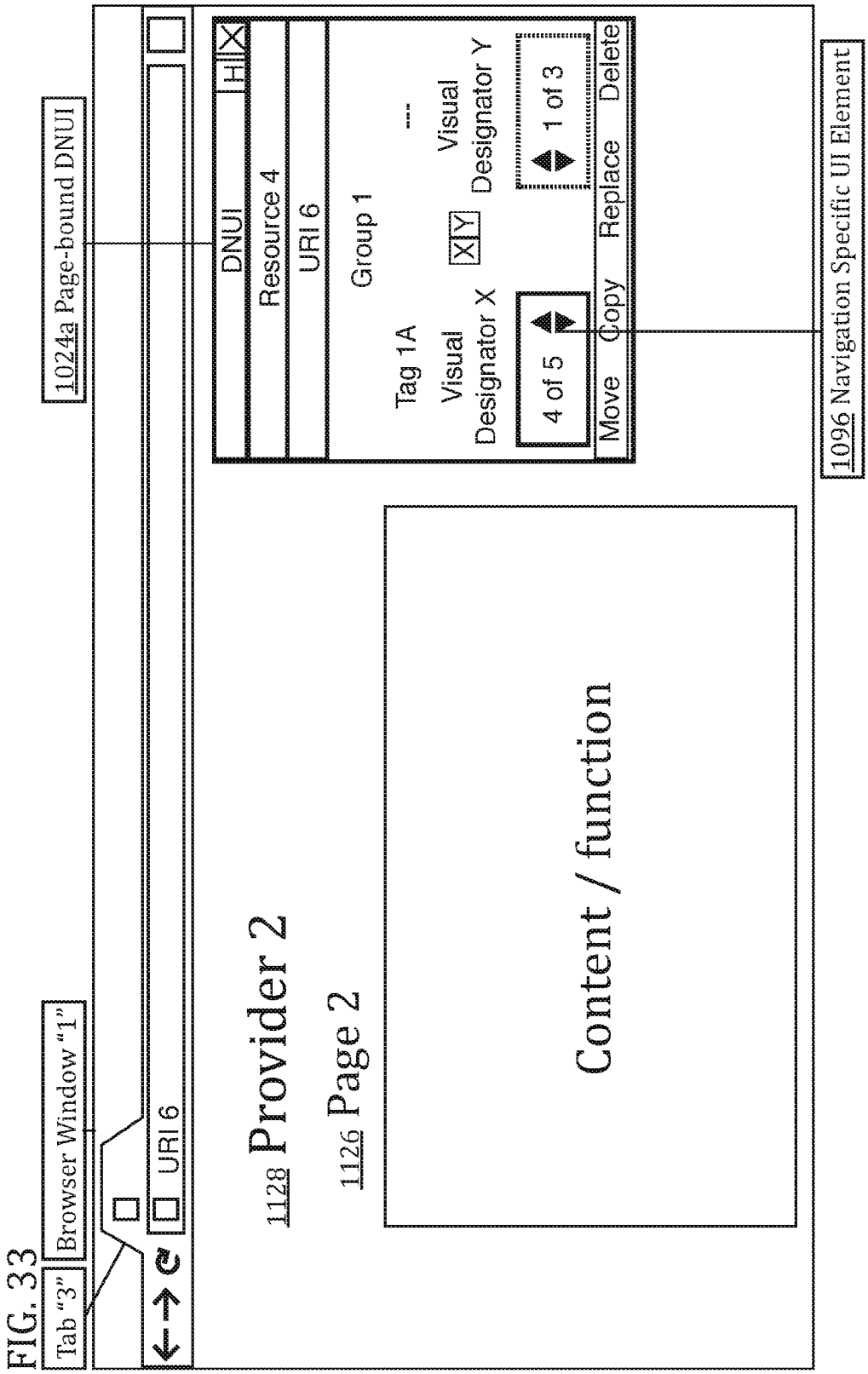
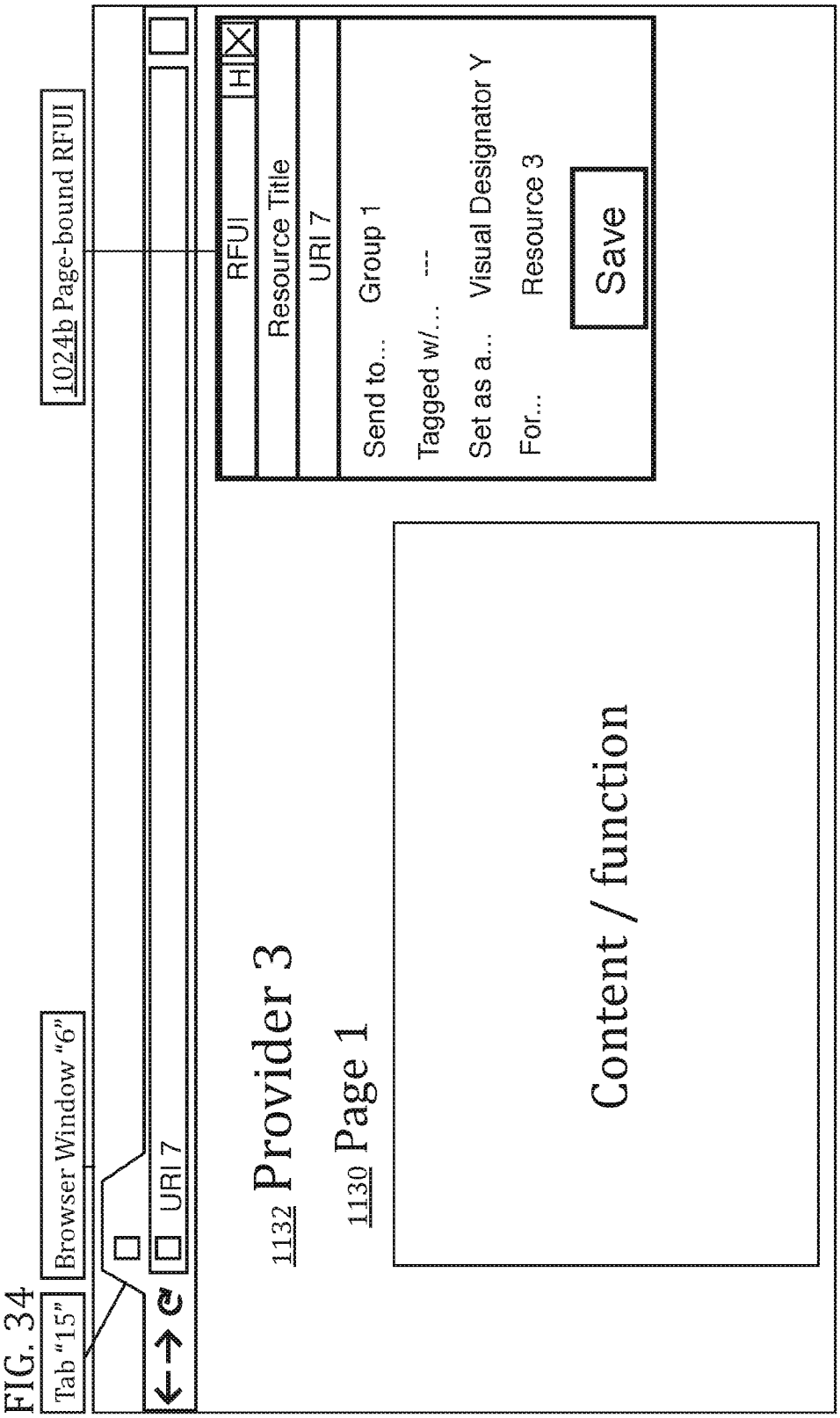
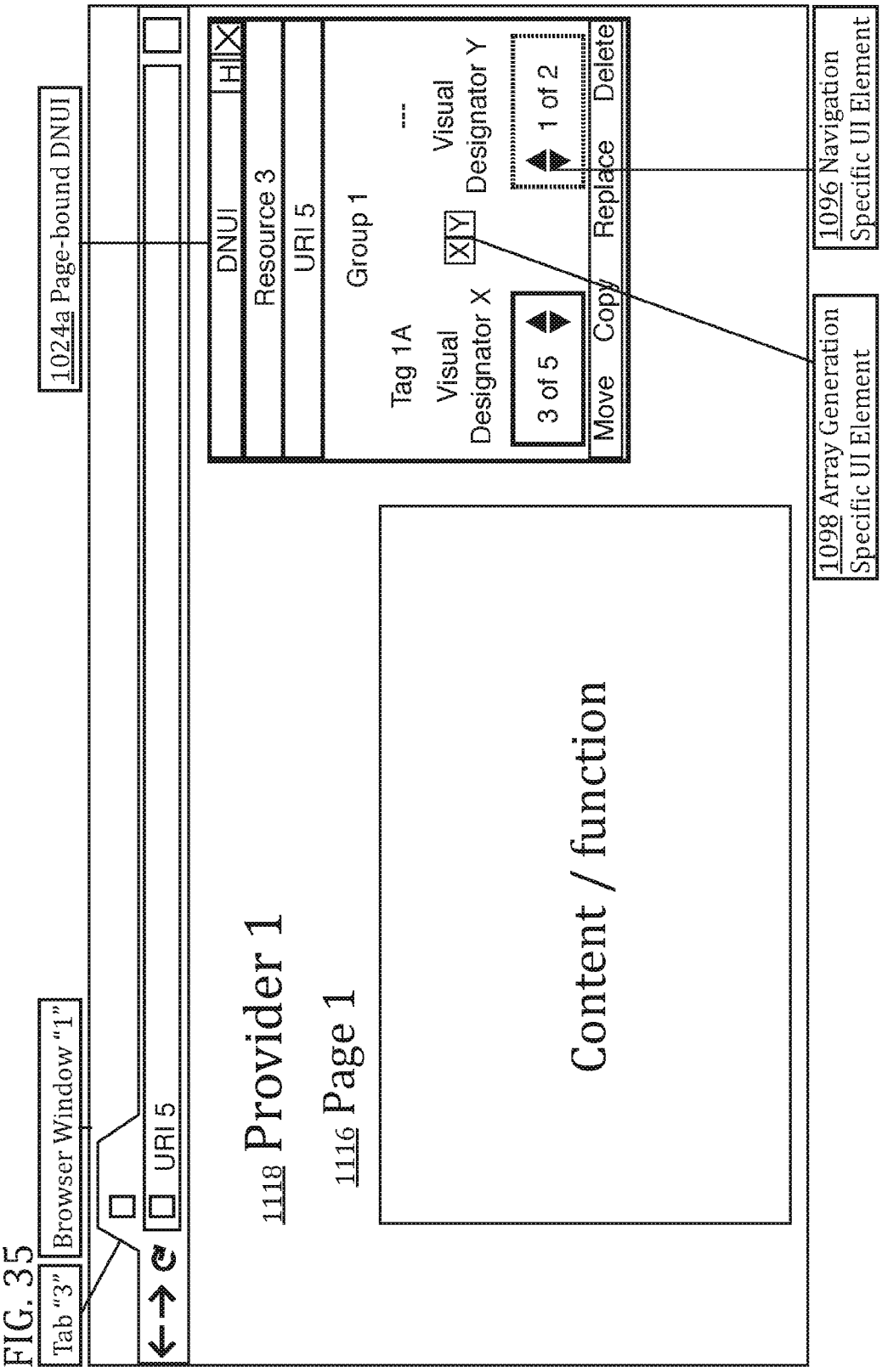

Tab "3"
Browser Window "1"
URI 6
1024a Page-bound DNUI
1128 Provider 2
1126 Page 2
Content / function
DNUI
Resource 4
URI 6
Group 1
Tag 1A
Visual Designator X
XY
Visual Designator Y
4 of 5
1 of 3
Move
Copy
Replace
Delete
1096 Navigation Specific UI Element

FIG. 34


Tab "15"
Browser Window "6"
1024b Page-bound RFUI
URI 7
1132 Provider 3
1130 Page 1
Content / function
RFUI
H
X
Resource Title
URI 7
Send to... Group 1
Tagged w/... ---
Set as a... Visual Designator Y
For... Resource 3
Save


Tab "3"
Browser Window "1"
URI 5
1024a Page-bound DNUI
1118 Provider 1
1116 Page 1
Content / function
DNUI
Resource 3
URI 5
Group 1
Tag 1A
Visual Designator X
3 of 5

Visual Designator Y
1 of 2
Move
Copy
Replace
Delete
1098 Array Generation Specific UI Element
1096 Navigation Specific UI Element

FIG. 35

FIG. 36

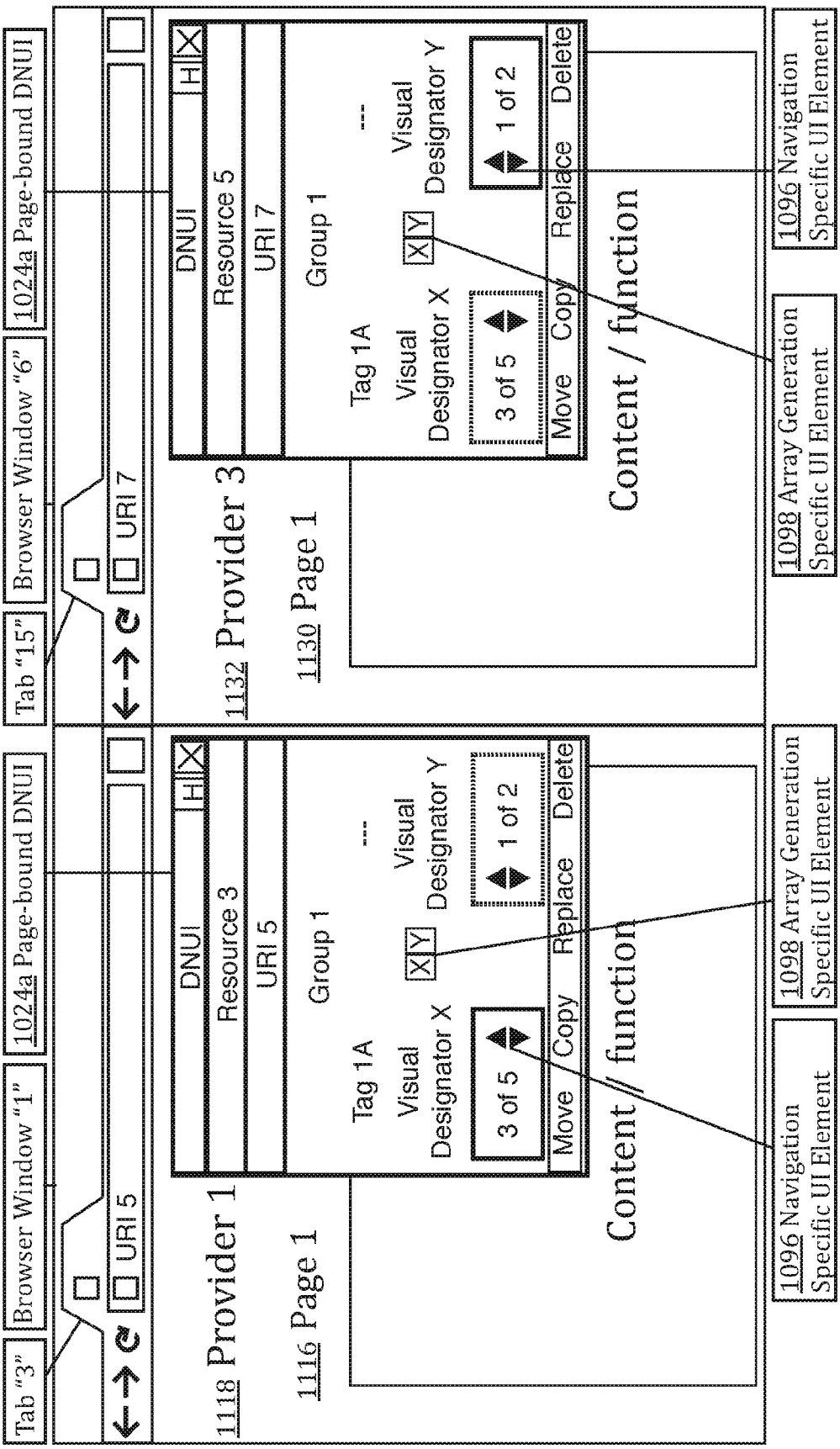
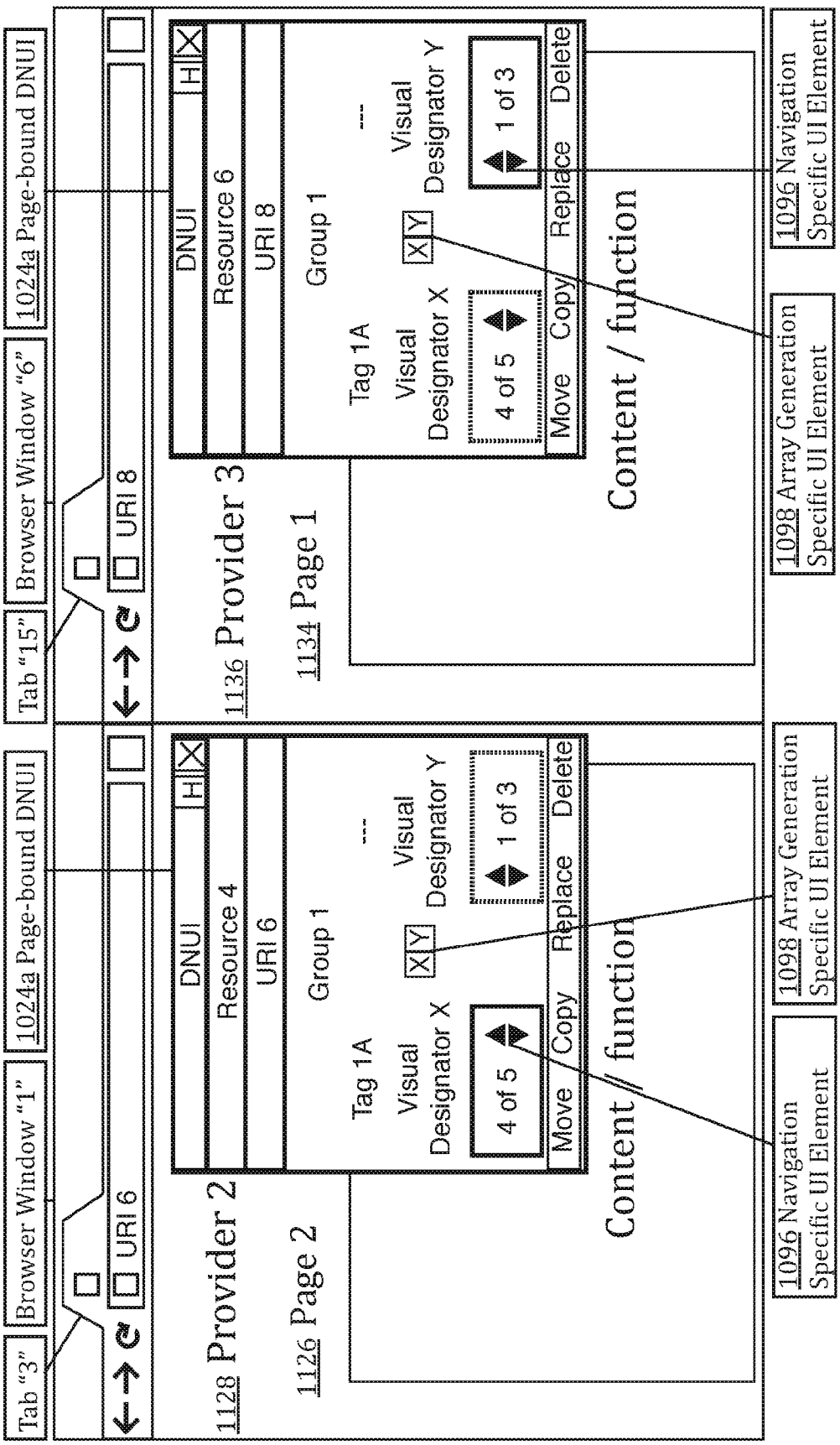
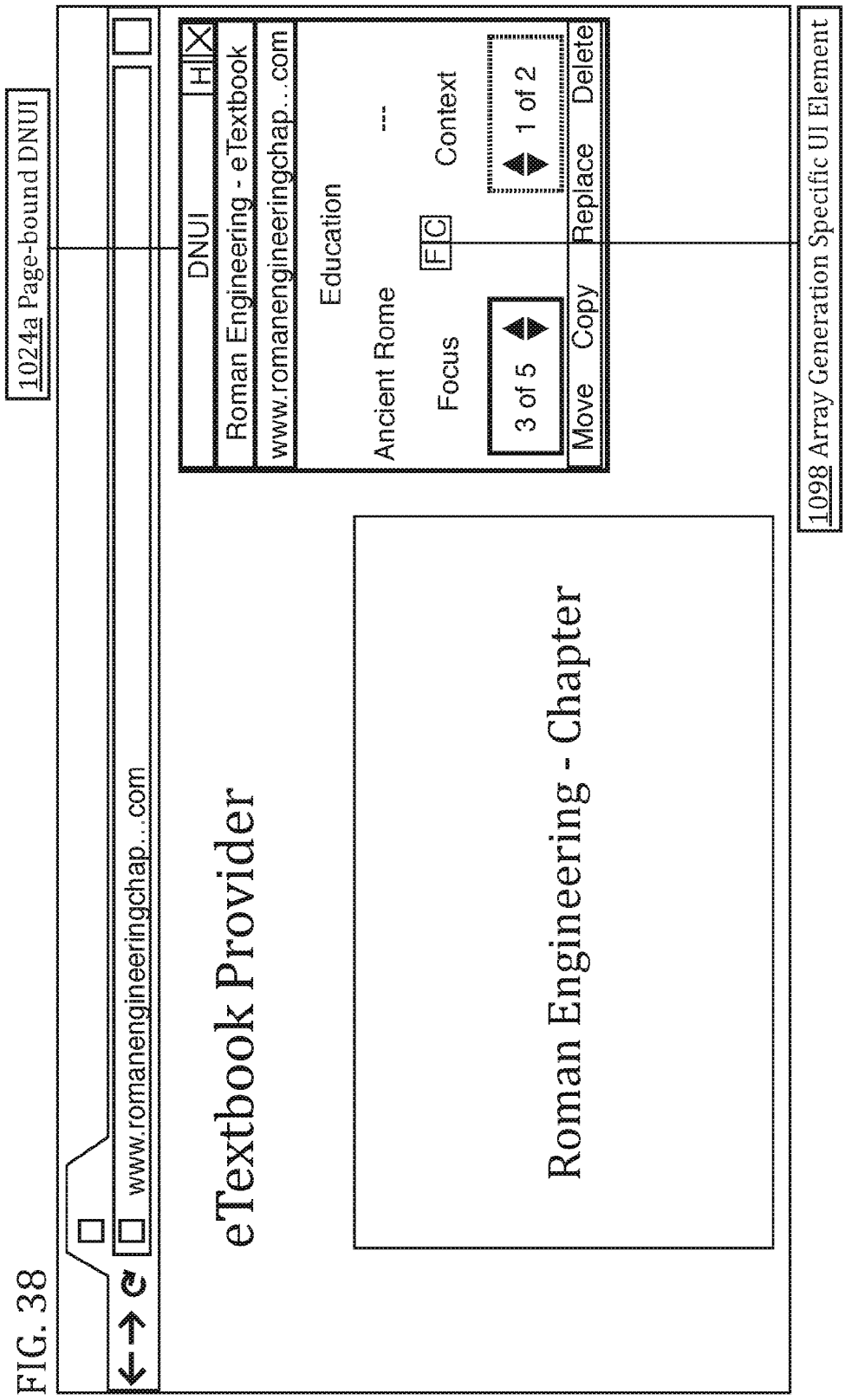

Tab "3"
Browser Window "1"
1024a Page-bound DNUI
Tab "15"
Browser Window "6"
1024a Page-bound DNUI
URI 5
URI 7
1118 Provider 1
1132 Provider 3
1116 Page 1
1130 Page 1
DNUI
H
X
Resource 3
Resource 5
URI 5
URI 7
Group 1
Group 1
Tag 1A
Visual Designator X
Visual Designator Y
X Y
3 of 5
1 of 2
Move
Copy
Replace
Delete
Content / function
1096 Navigation Specific UI Element
1098 Array Generation Specific UI Element

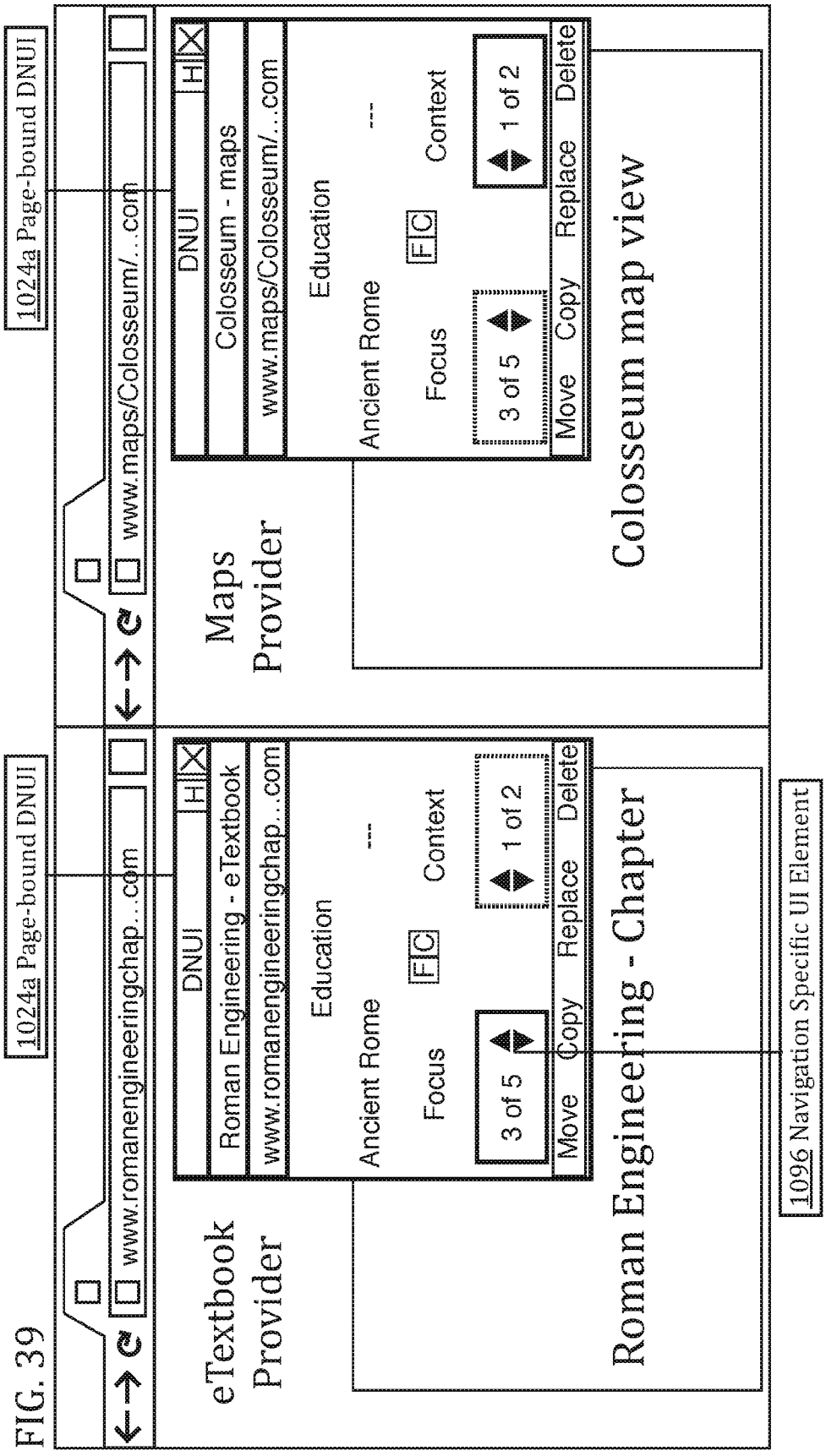
FIG. 37


Tab "3"
Browser Window "1"
1024a Page-bound DNUI
URI 6
1128 Provider 2
DNUI
Resource 4
URI 6
1126 Page 2
Group 1
Tag 1A
Visual Designator X
Visual Designator Y
4 of 5
1 of 3
Move
Copy
Replace
Delete
Content / function
1096 Navigation Specific UI Element
1098 Array Generation Specific UI Element
Tab "15"
Browser Window "6"
1024a Page-bound DNUI
URI 8
1136 Provider 3
DNUI
Resource 6
URI 8
1134 Page 1
Group 1
Tag 1A
Visual Designator X
Visual Designator Y
4 of 5
1 of 3
Move
Copy
Replace
Delete
Content / function
1098 Array Generation Specific UI Element
1096 Navigation Specific UI Element


1024a Page-bound DNUI
www.romanengineeringchap...com
eTextbook Provider
Roman Engineering - Chapter
DNUI
Roman Engineering - eTextbook
www.romanengineeringchap...com
Education
Ancient Rome

Focus
F C
Context
3 of 5
1 of 2
Move Copy Replace Delete
1098 Array Generation Specific UI Element

FIG. 38

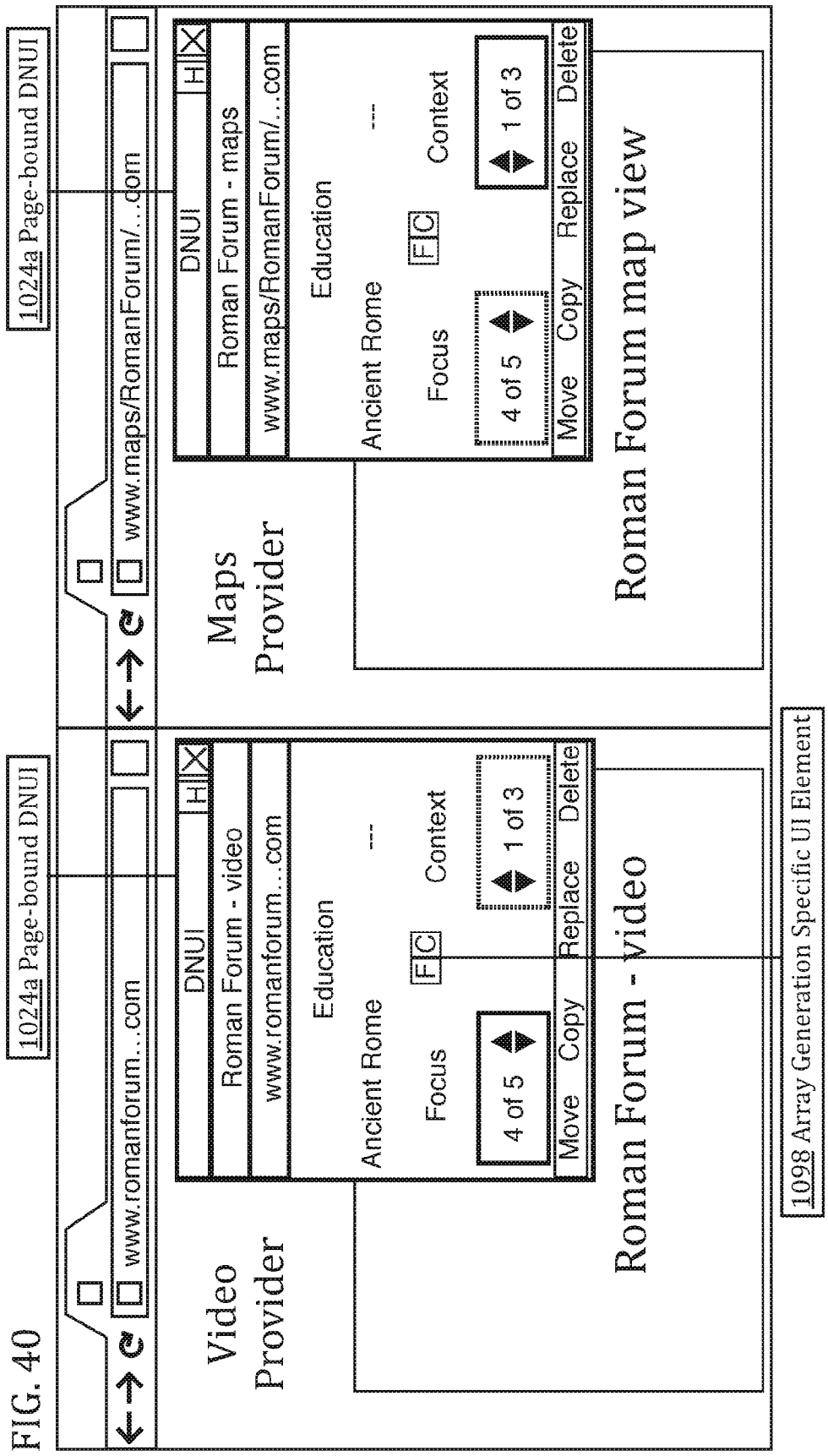

1024a Page-bound DNUI
www.romanengineeringchap...com
DNUI
Roman Engineering - eTextbook
www.romanengineeringchap...com
Education
Ancient Rome

Focus
FIC
Context
3 of 5
1 of 2
Move
Copy
Replace
Delete
eTextbook Provider
Roman Engineering - Chapter
1024a Page-bound DNUI
www.maps/Colosseum/...com
DNUI
Colosseum - maps
www.maps/Colosseum/...com
Education
Ancient Rome

Focus
FIC
Context
3 of 5
1 of 2
Move
Copy
Replace
Delete
Maps Provider
Colosseum map view
1096 Navigation Specific UI Element

FIG. 39

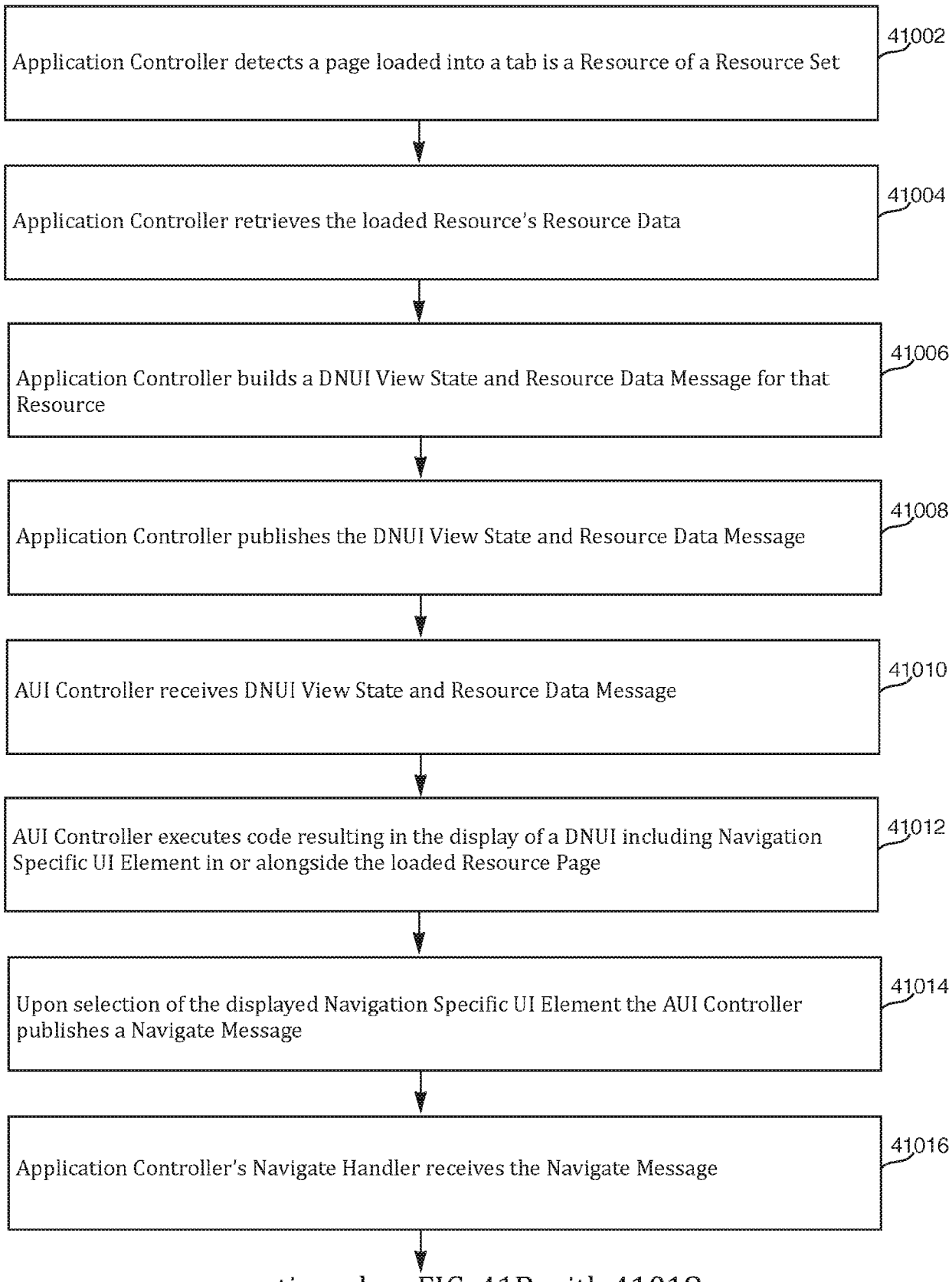
FIG. 40


1024a Page-bound DNUI
www.romanforum...com
1024a Page-bound DNUI
www.maps/RomanForum/...com
Video Provider
DNUI
Roman Forum - video
www.romanforum...com
Education
Ancient Rome

Focus
FC
Context
4 of 5
1 of 3
Move
Copy
Replace
Delete
Roman Forum - video
Maps Provider
DNUI
Roman Forum - maps
www.maps/RomanForum/...com
Education
Ancient Rome

Focus
FC
Context
4 of 5
1 of 3
Move
Copy
Replace
Delete
Roman Forum map view
1098 Array Generation Specific UI Element

FIG. 41A



continued on FIG. 41B with 41018

FIG. 41B

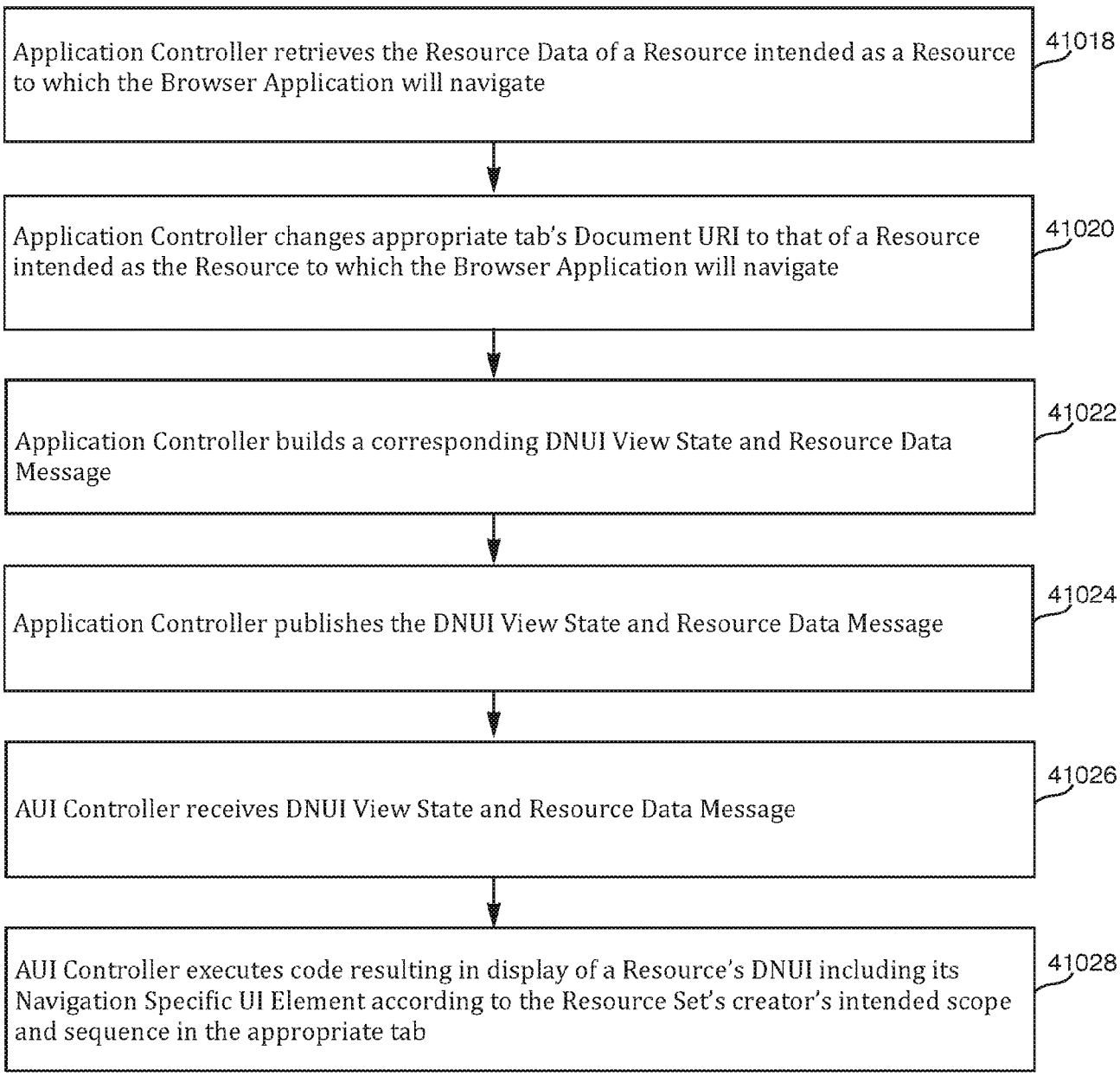

Application Controller retrieves the Resource Data of a Resource intended as a Resource to which the Browser Application will navigate
41018
Application Controller changes appropriate tab's Document URI to that of a Resource intended as the Resource to which the Browser Application will navigate
41020
Application Controller builds a corresponding DNUI View State and Resource Data Message
41022
Application Controller publishes the DNUI View State and Resource Data Message
41024
AUI Controller receives DNUI View State and Resource Data Message
41026
AUI Controller executes code resulting in display of a Resource's DNUI including its Navigation Specific UI Element according to the Resource Set's creator's intended scope and sequence in the appropriate tab
41028

FIG. 42

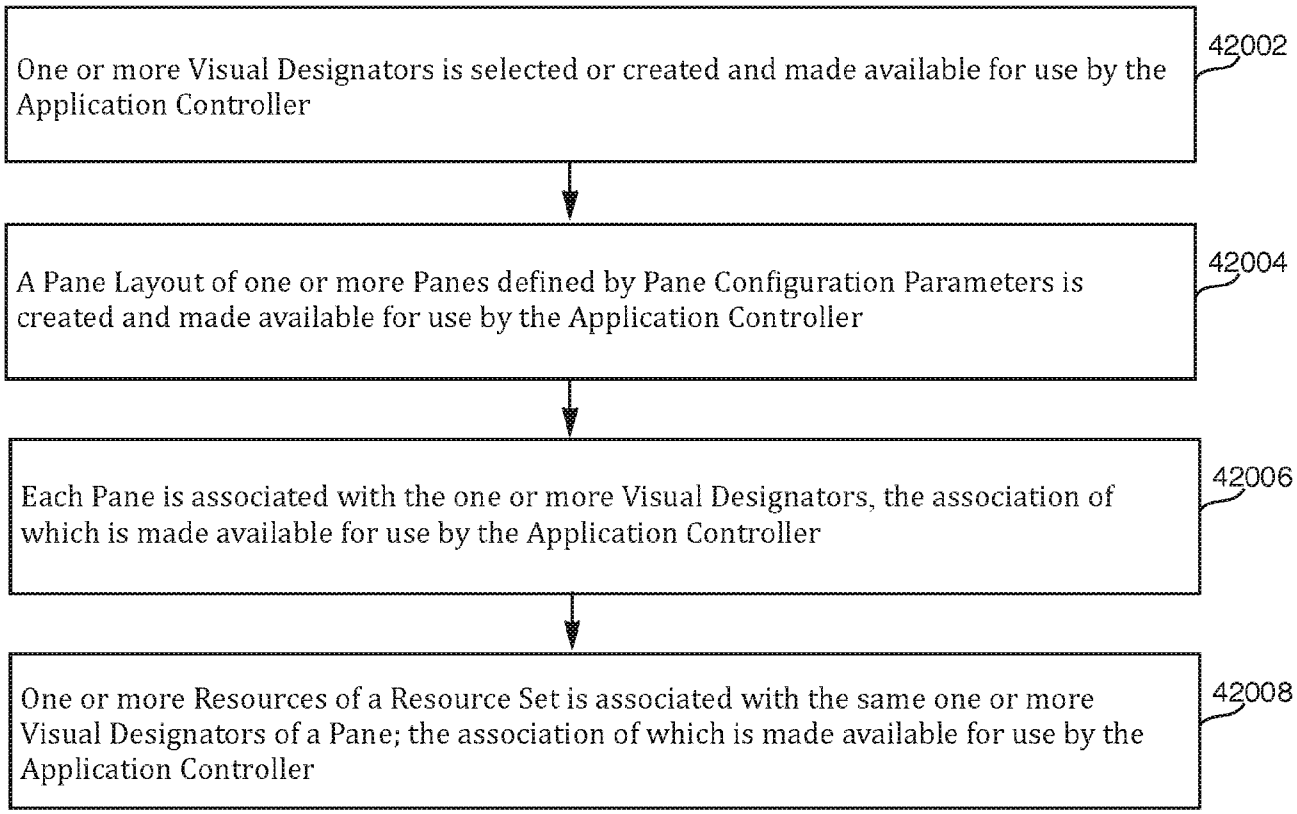

One or more Visual Designators is selected or created and made available for use by the Application Controller
42002
A Pane Layout of one or more Panes defined by Pane Configuration Parameters is created and made available for use by the Application Controller
42004
Each Pane is associated with the one or more Visual Designators, the association of which is made available for use by the Application Controller
42006
One or more Resources of a Resource Set is associated with the same one or more Visual Designators of a Pane; the association of which is made available for use by the Application Controller
42008

FIG. 43

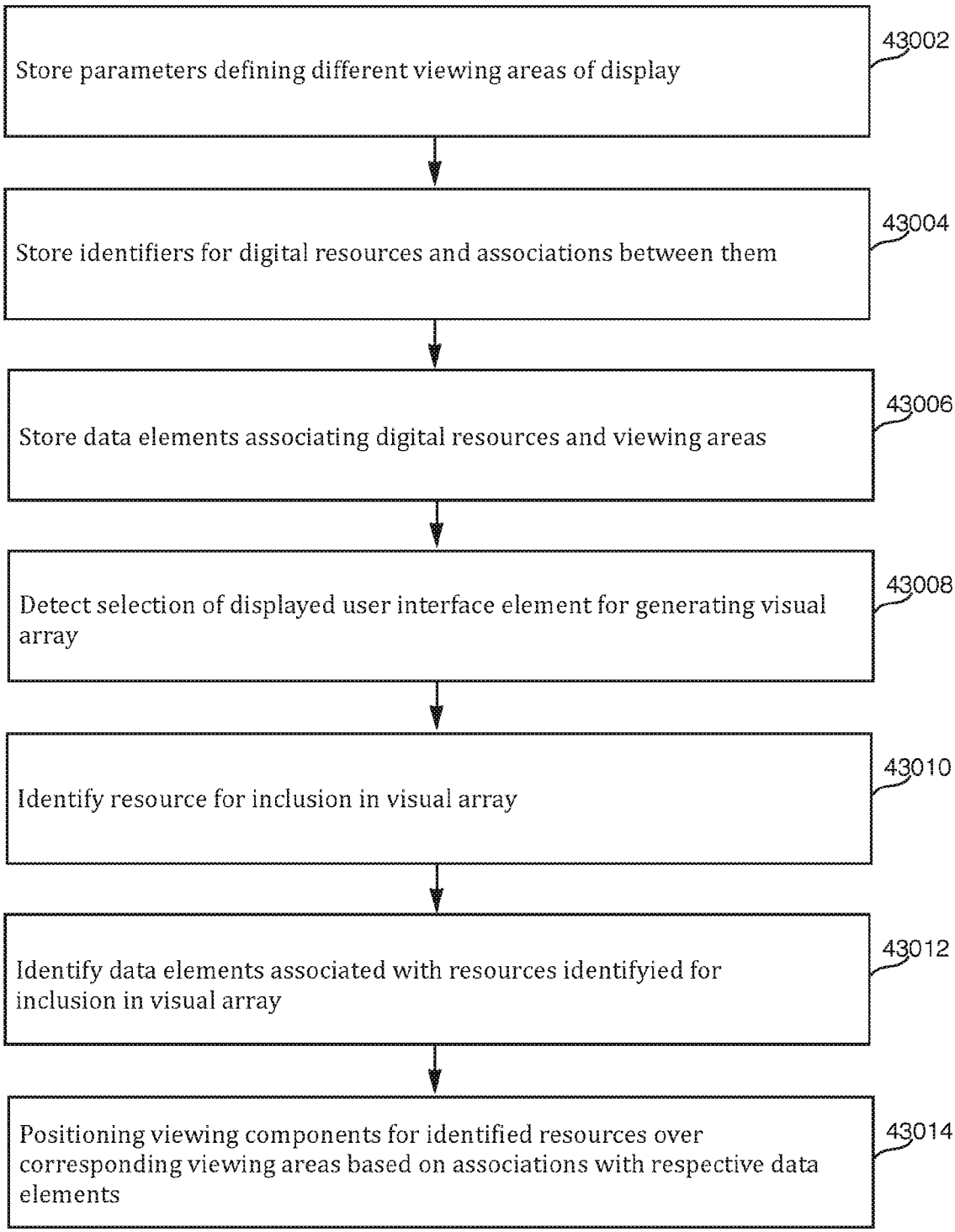
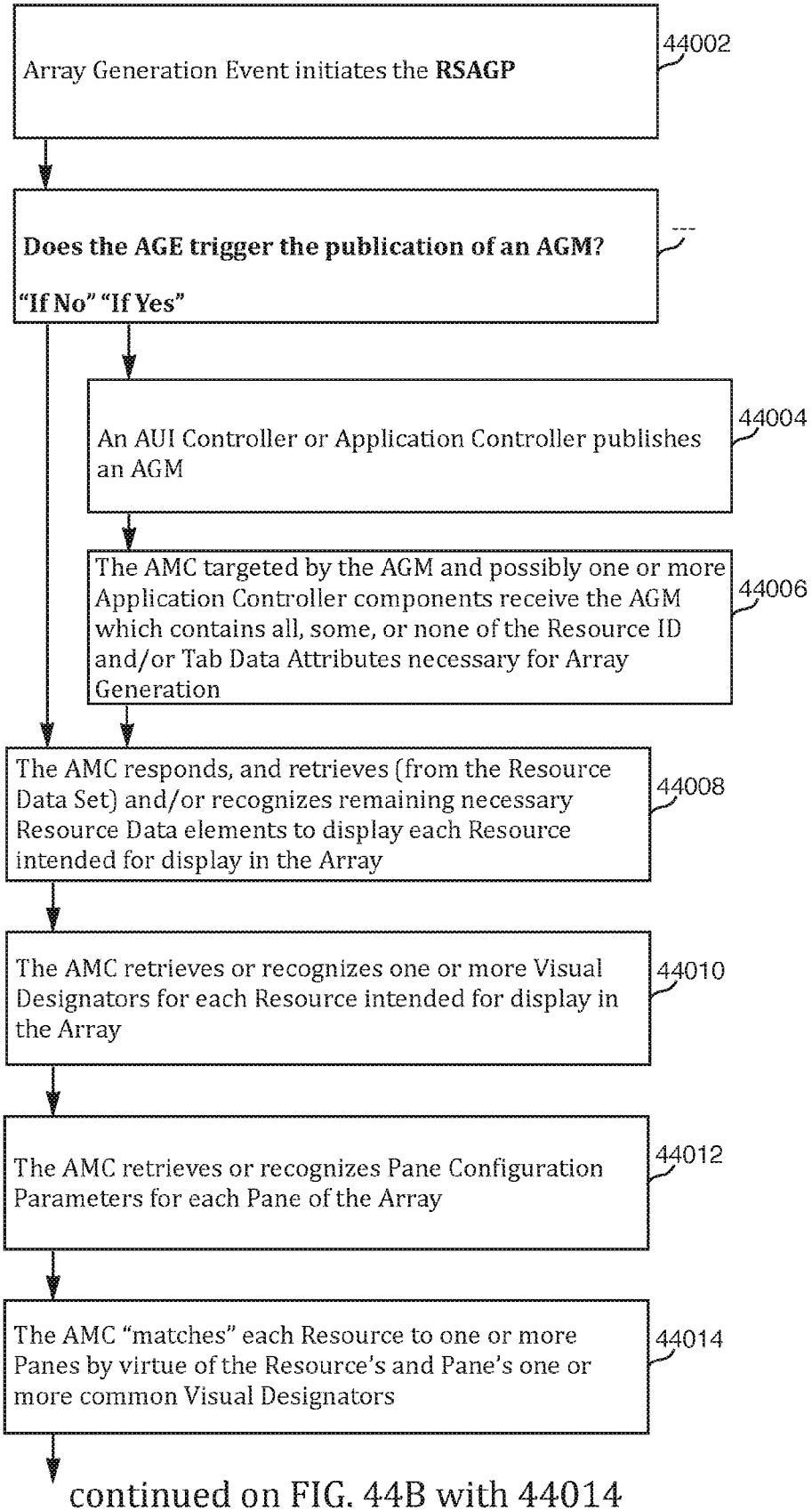

Store parameters defining different viewing areas of display
43002
Store identifiers for digital resources and associations between them
43004
Store data elements associating digital resources and viewing areas
43006
Detect selection of displayed user interface element for generating visual array
43008
Identify resource for inclusion in visual array
43010
Identify data elements associated with resources identifyied for inclusion in visual array
43012
Positioning viewing components for identified resources over corresponding viewing areas based on associations with respective data elements
43014

FIG. 44A



continued on FIG. 44B with 44014

FIG. 44B

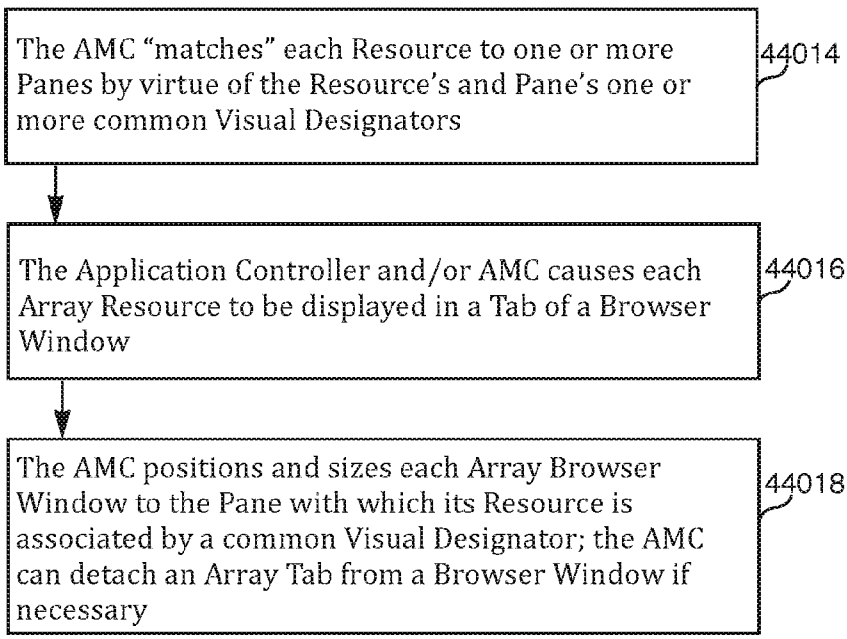
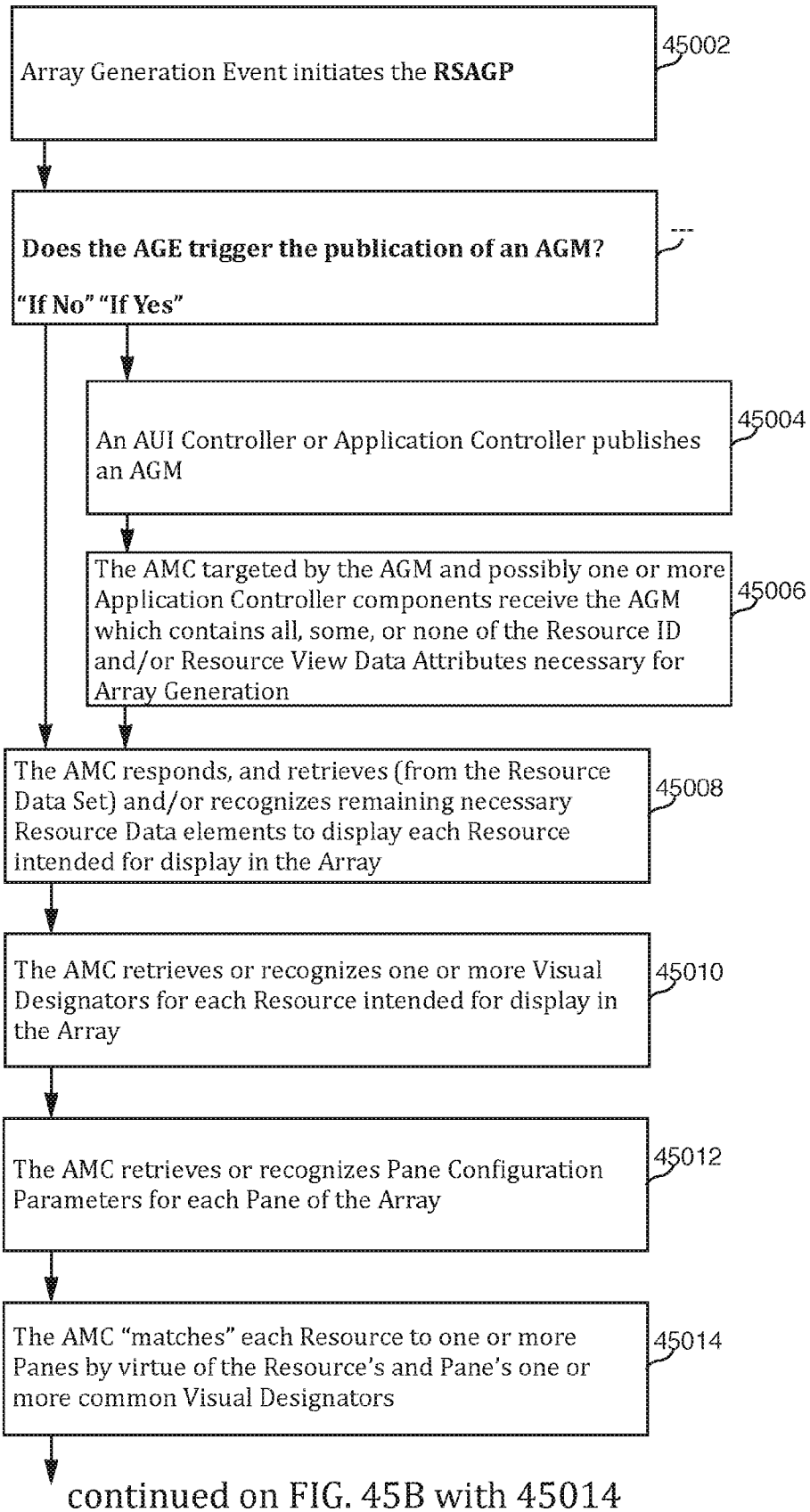

The AMC "matches" each Resource to one or more Panes by virtue of the Resource's and Pane's one or more common Visual Designators
44014
The Application Controller and/or AMC causes each Array Resource to be displayed in a Tab of a Browser Window
44016
The AMC positions and sizes each Array Browser Window to the Pane with which its Resource is associated by a common Visual Designator; the AMC can detach an Array Tab from a Browser Window if necessary
44018

FIG. 45A



continued on FIG. 45B with 45014

FIG. 45B

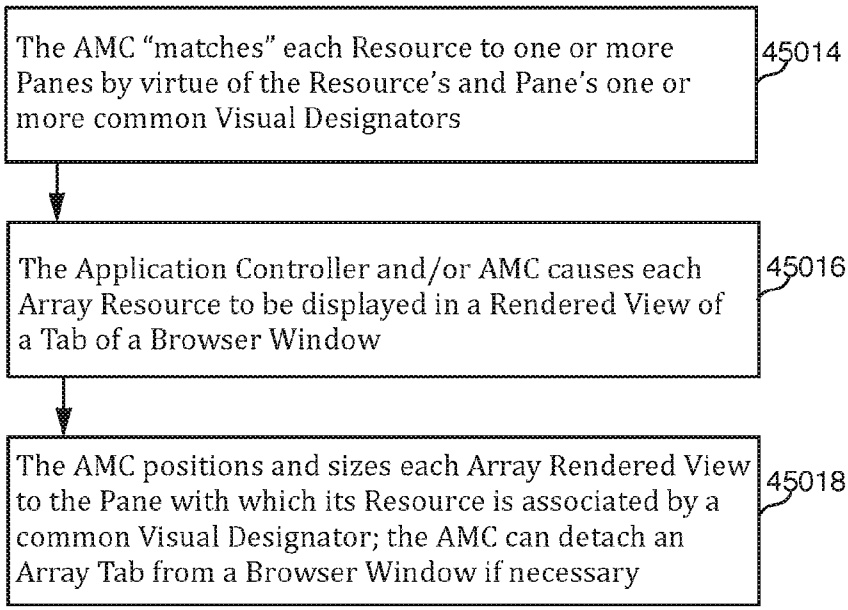
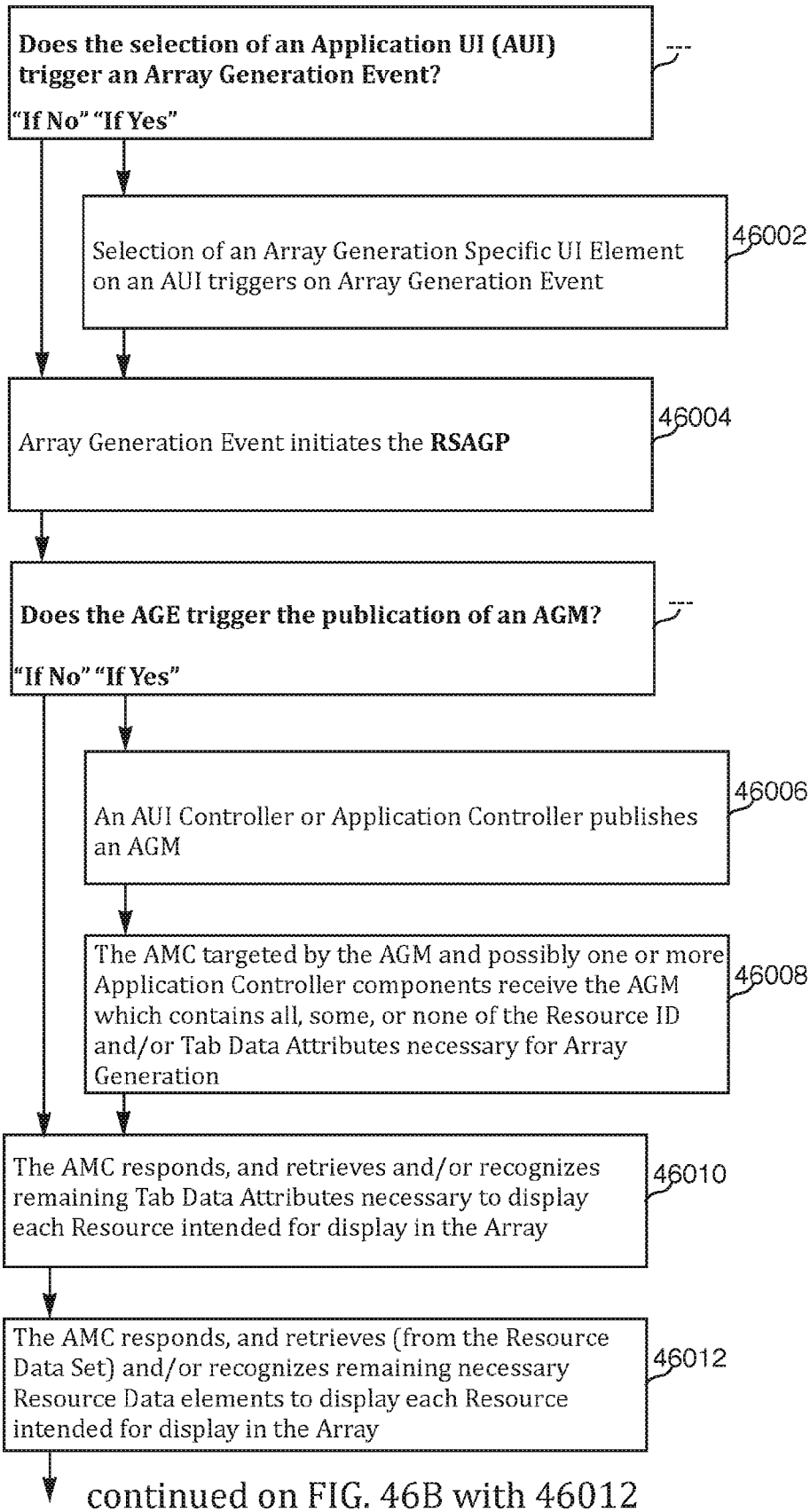
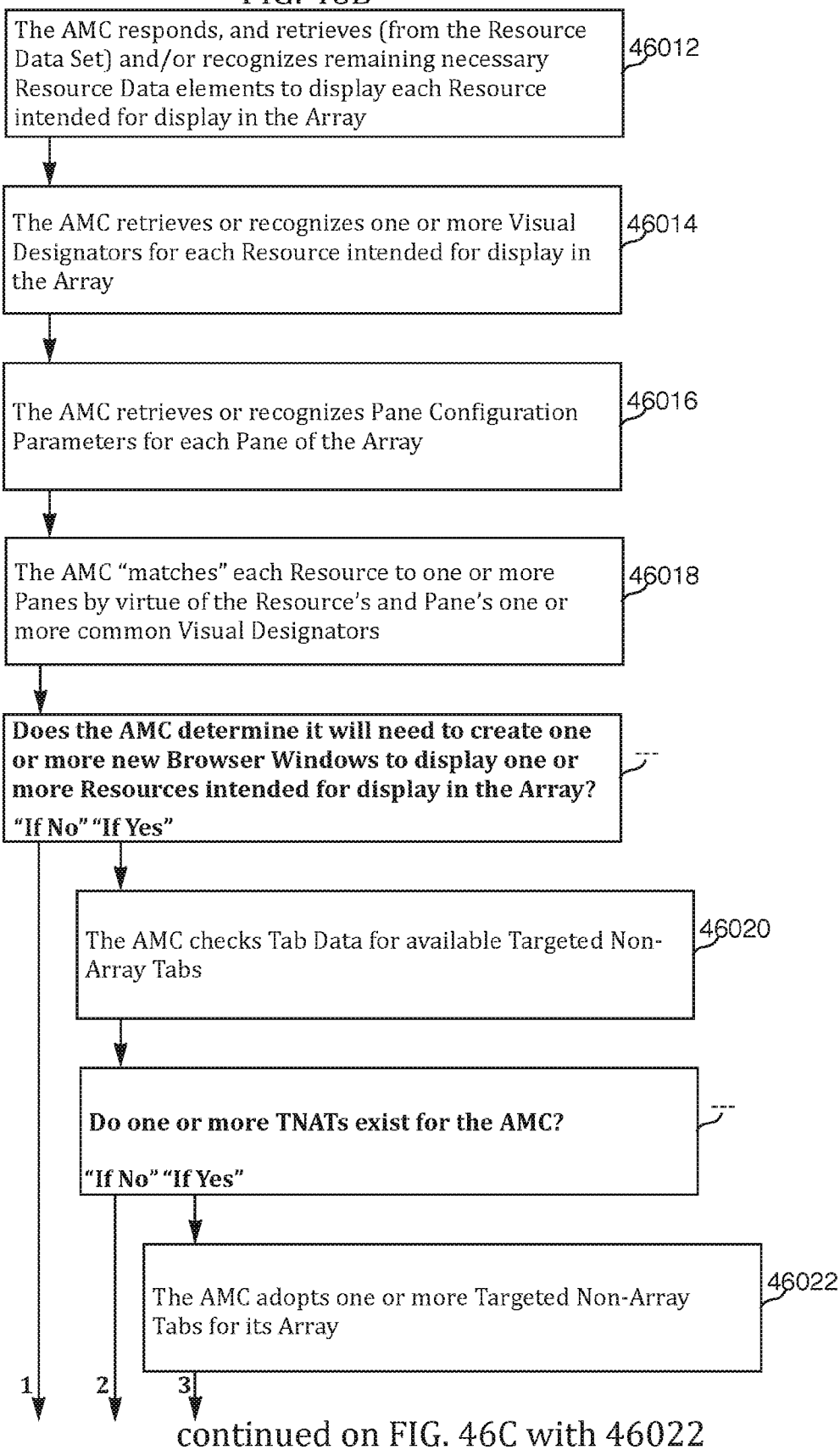

The AMC "matches" each Resource to one or more Panes by virtue of the Resource's and Pane's one or more common Visual Designators
45014
The Application Controller and/or AMC causes each Array Resource to be displayed in a Rendered View of a Tab of a Browser Window
45016
The AMC positions and sizes each Array Rendered View to the Pane with which its Resource is associated by a common Visual Designator; the AMC can detach an Array Tab from a Browser Window if necessary
45018

FIG. 46A



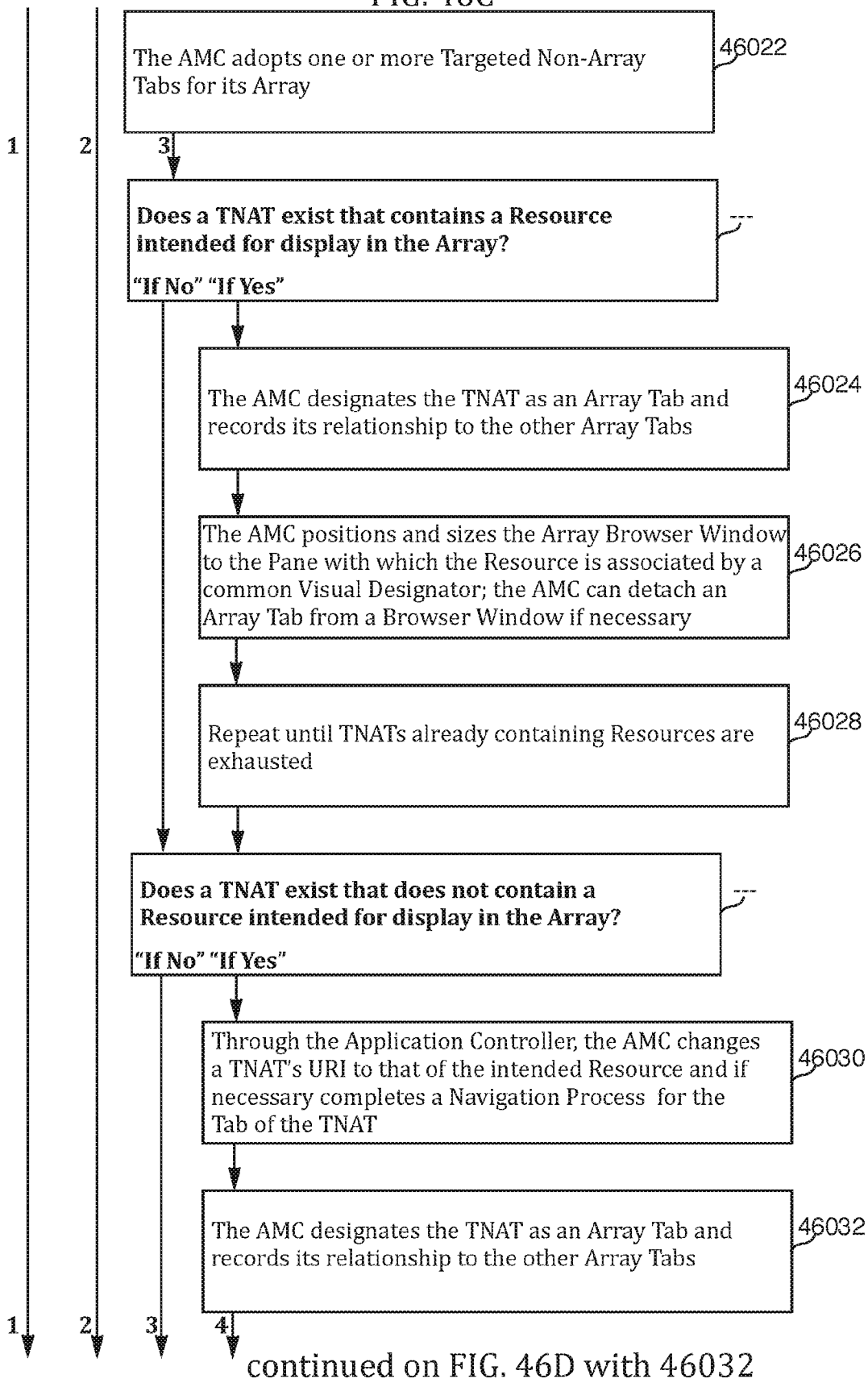
continued on FIG. 46B with 46012

FIG. 46B



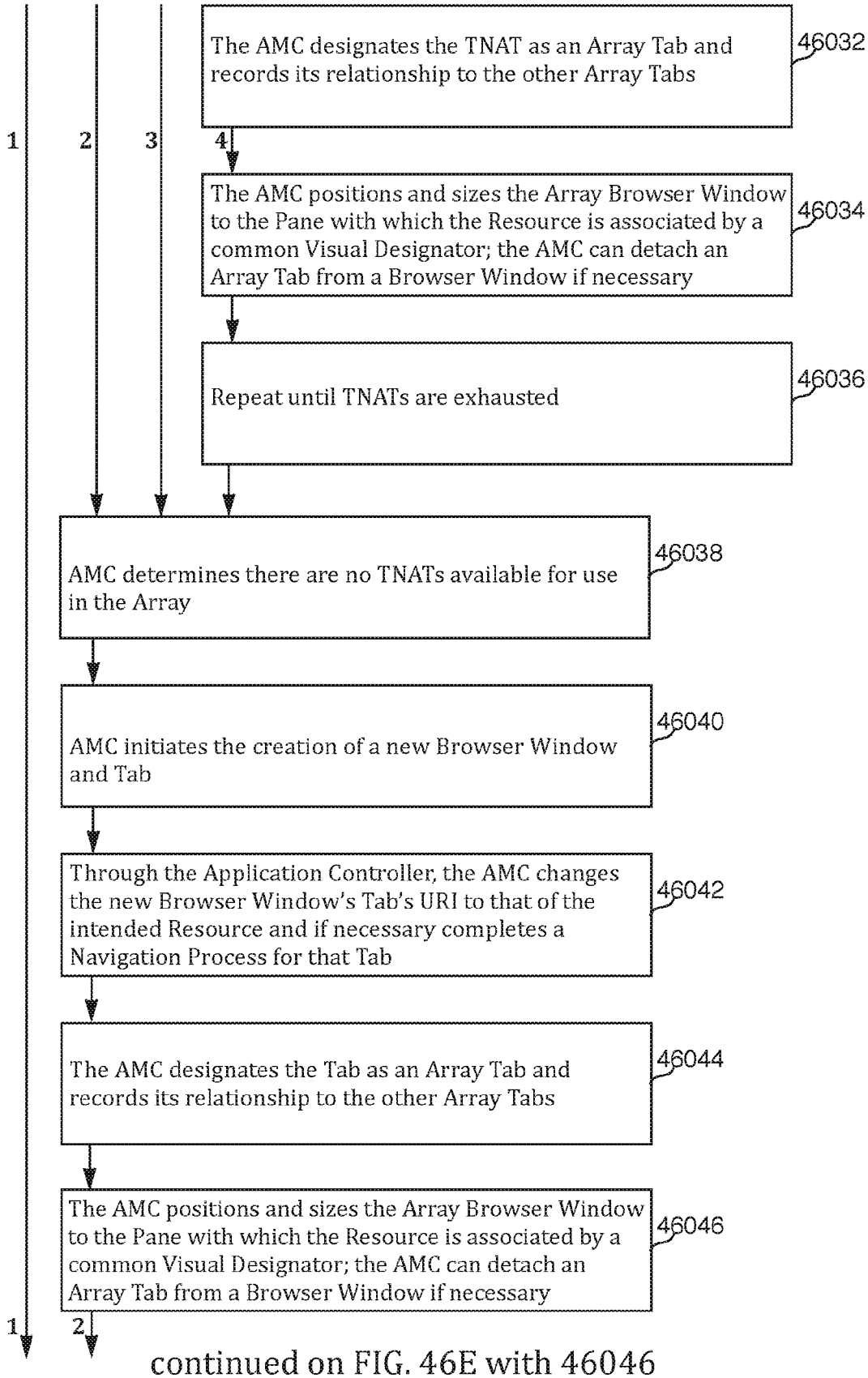
continued on FIG. 46C with 46022

FIG. 46C



continued on FIG. 46D with 46032

FIG. 46D



continued on FIG. 46E with 46046

FIG. 46E

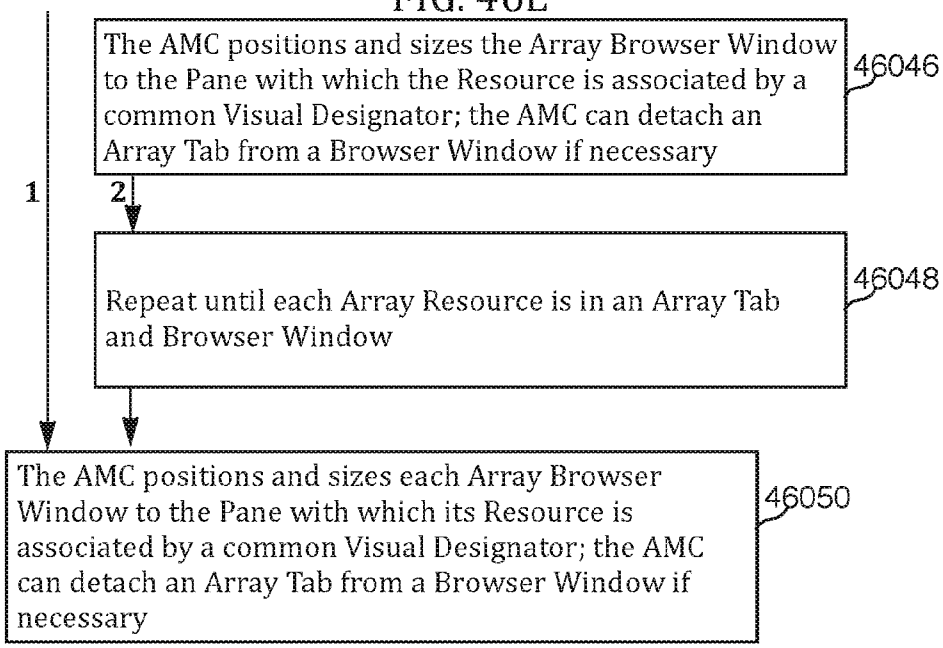
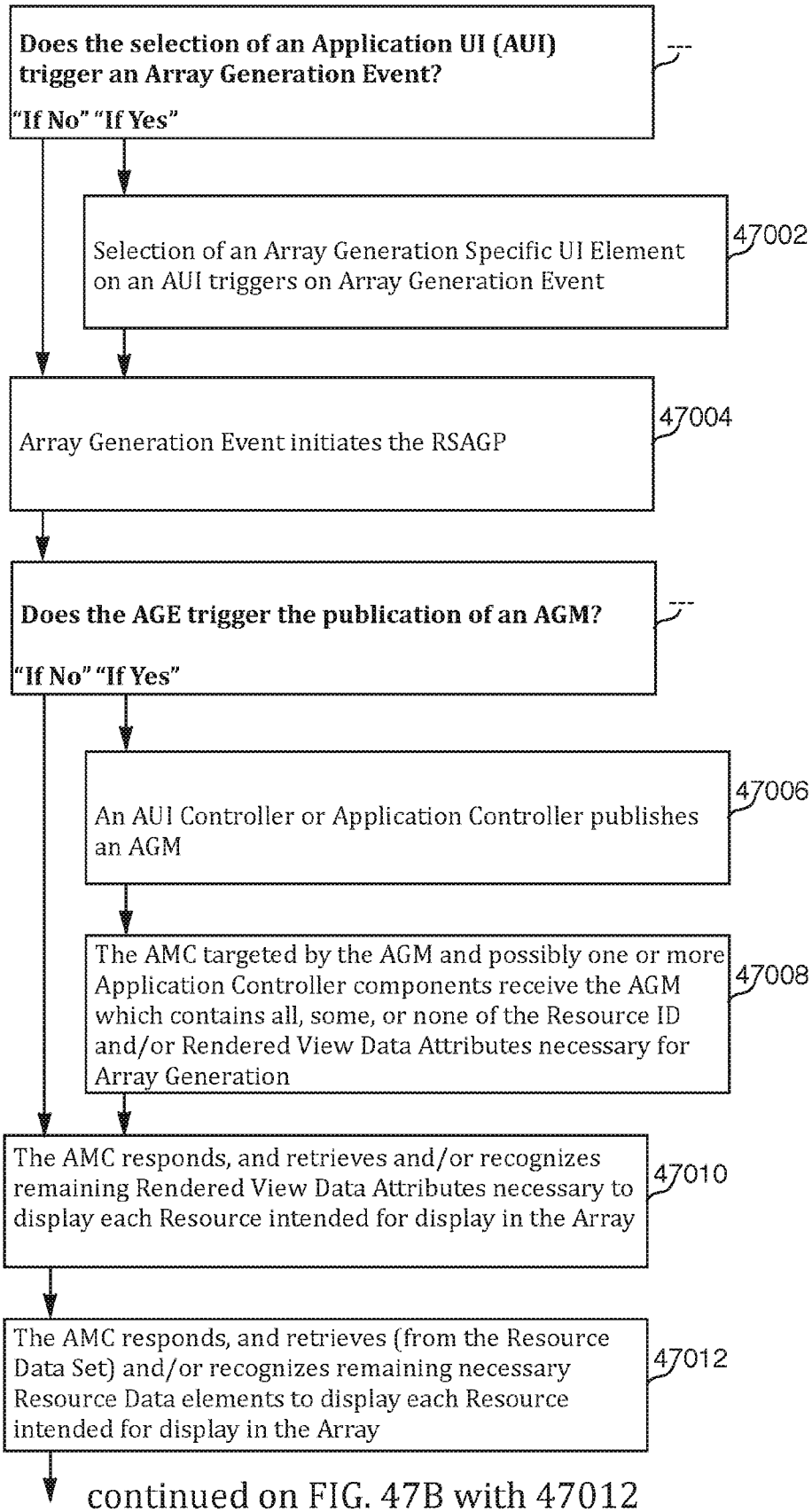
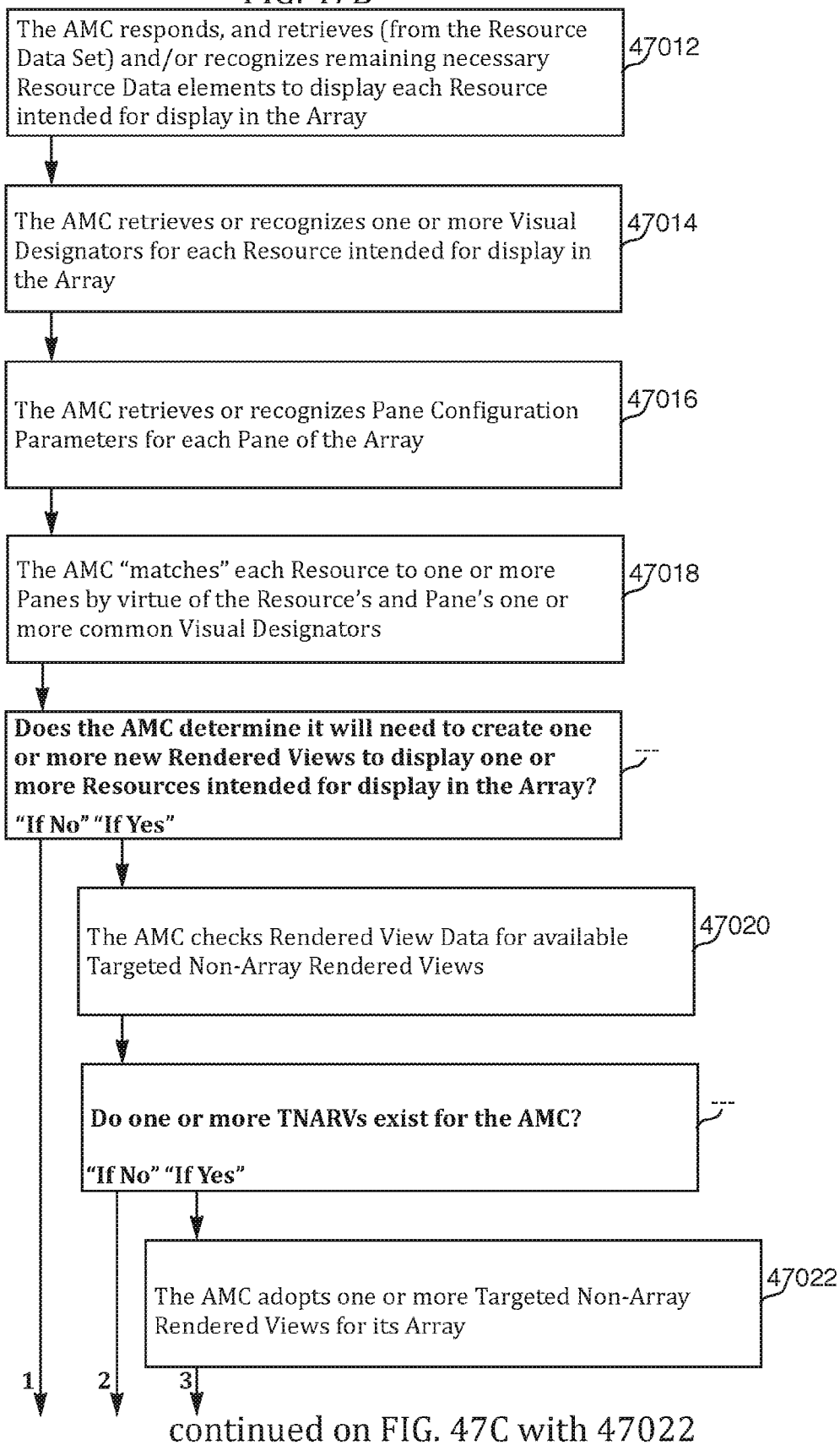

The AMC positions and sizes the Array Browser Window to the Pane with which the Resource is associated by a common Visual Designator; the AMC can detach an Array Tab from a Browser Window if necessary
46046
1
2
Repeat until each Array Resource is in an Array Tab and Browser Window
46048
The AMC positions and sizes each Array Browser Window to the Pane with which its Resource is associated by a common Visual Designator; the AMC can detach an Array Tab from a Browser Window if necessary
46050

FIG. 47A



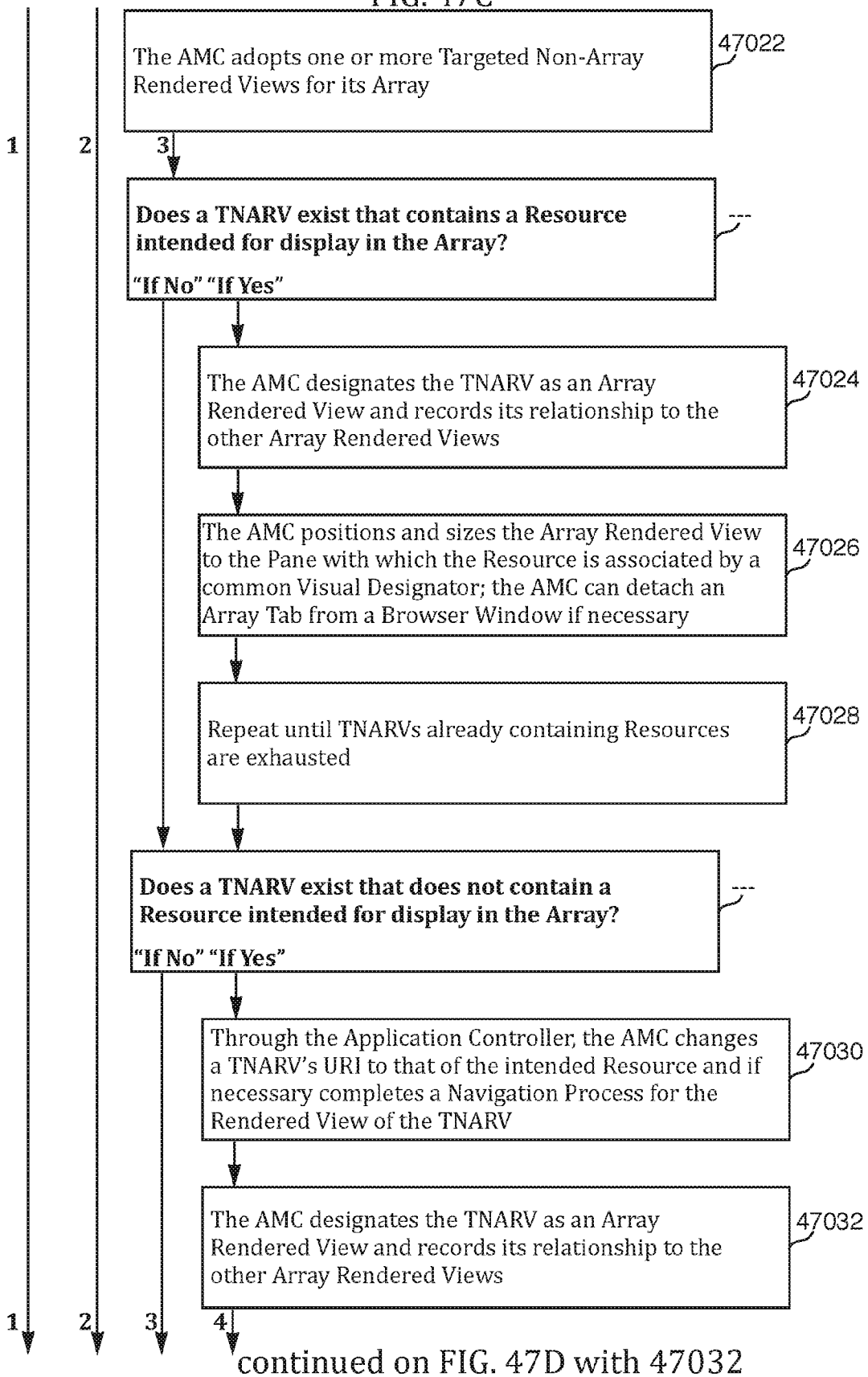
continued on FIG. 47B with 47012

FIG. 47B



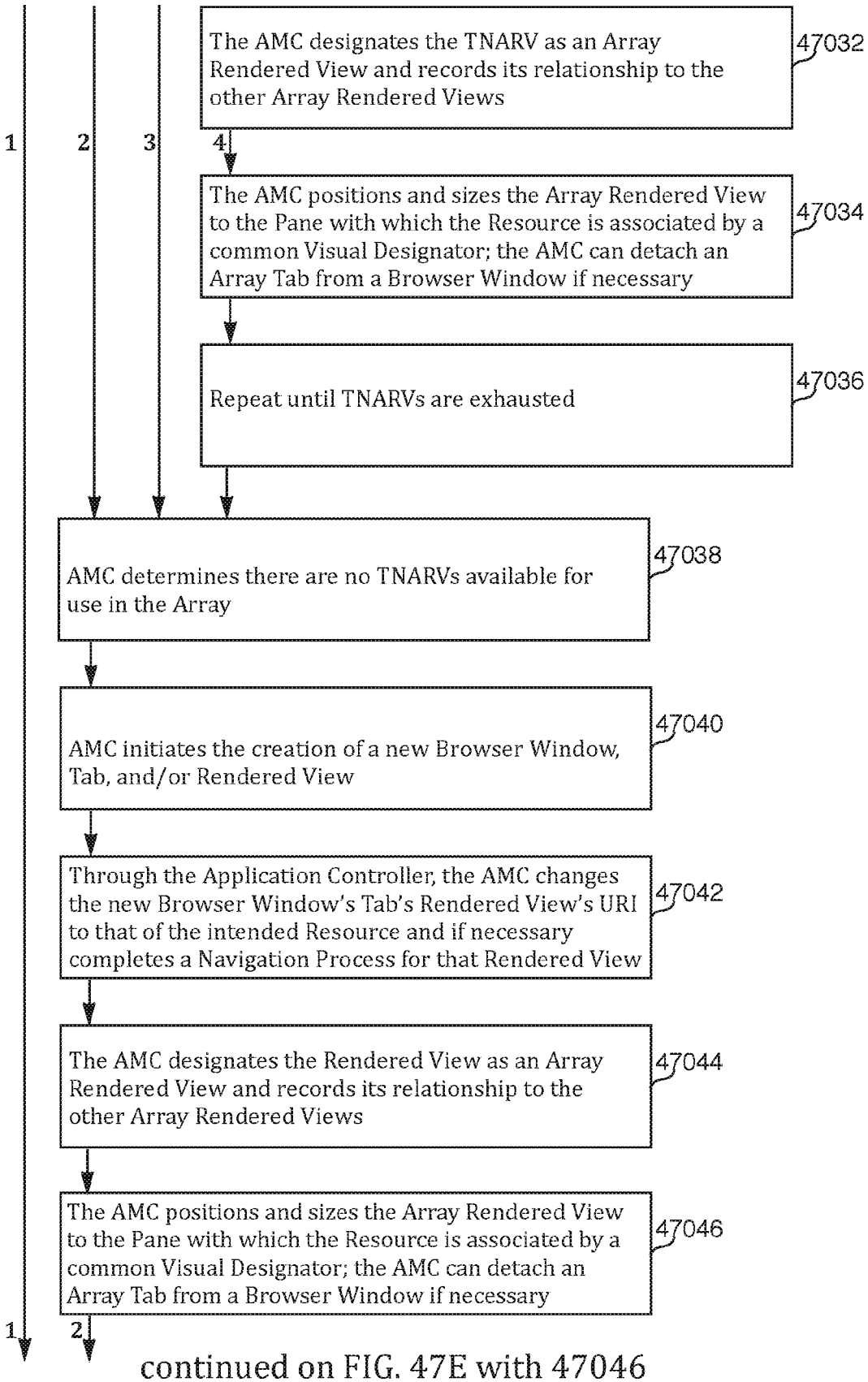
continued on FIG. 47C with 47022

FIG. 47C



continued on FIG. 47D with 47032

FIG. 47D



continued on FIG. 47E with 47046

FIG. 47E

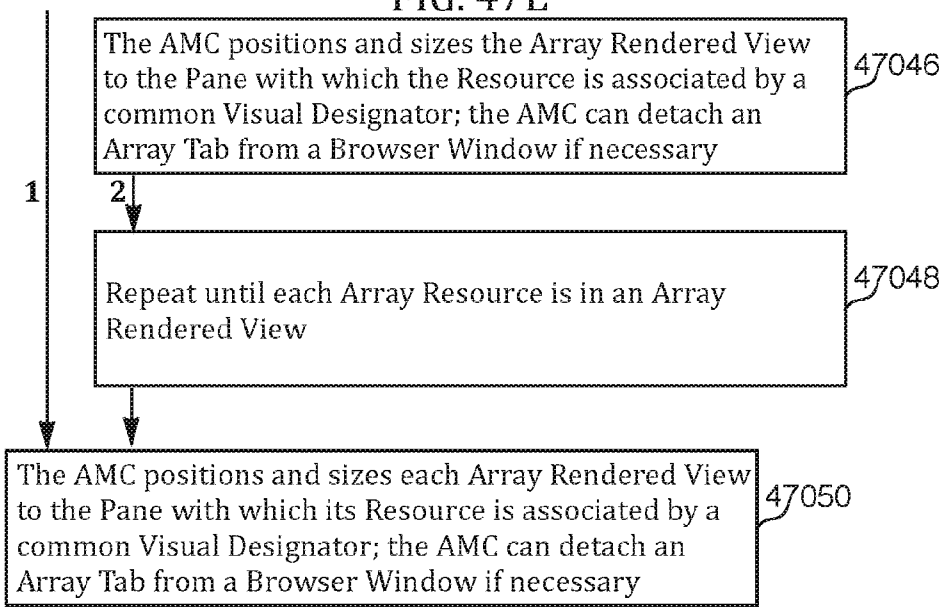

The AMC positions and sizes the Array Rendered View to the Pane with which the Resource is associated by a common Visual Designator; the AMC can detach an Array Tab from a Browser Window if necessary
47046
1
2
Repeat until each Array Resource is in an Array Rendered View
47048
The AMC positions and sizes each Array Rendered View to the Pane with which its Resource is associated by a common Visual Designator; the AMC can detach an Array Tab from a Browser Window if necessary
47050

FIG. 48

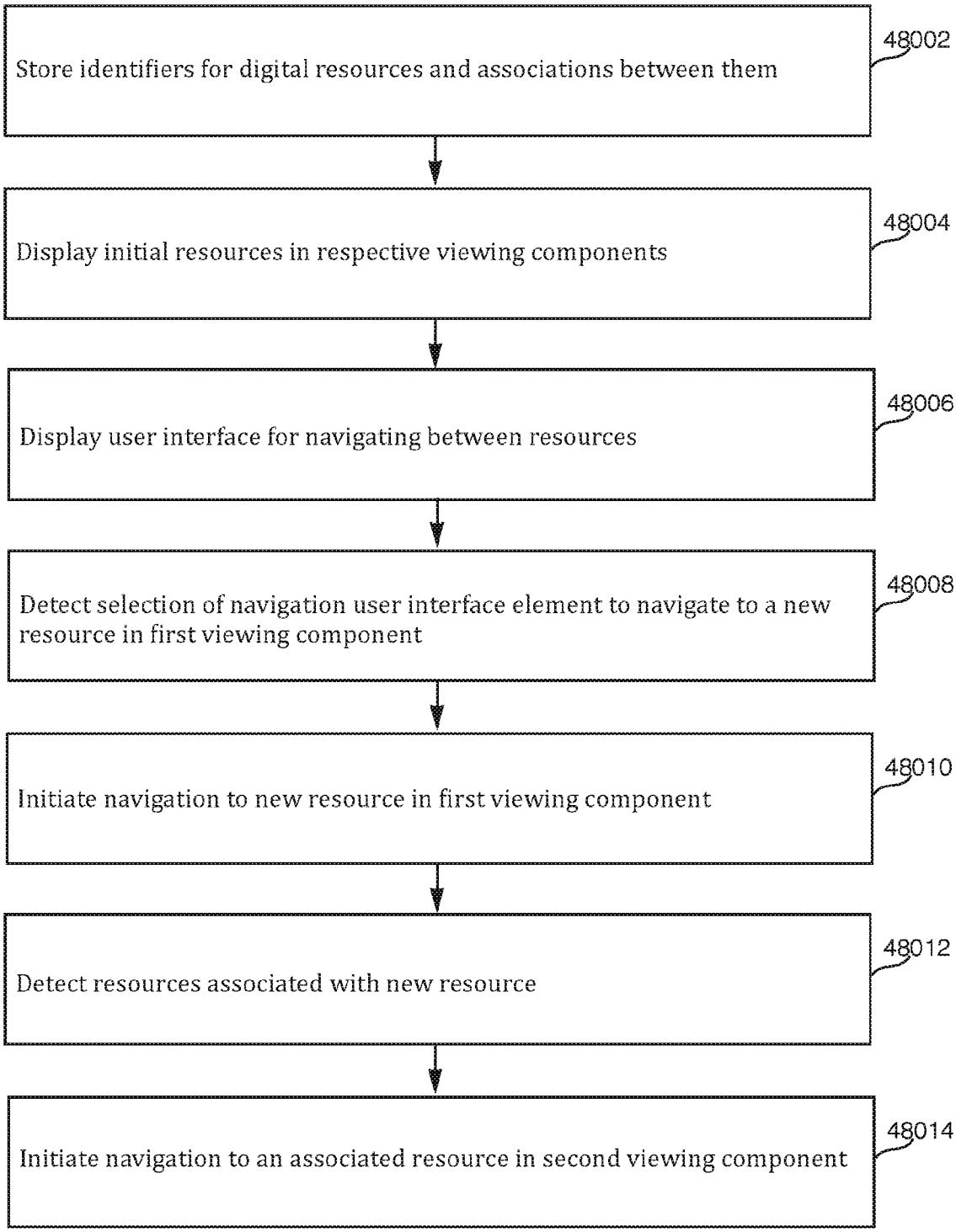

Store identifiers for digital resources and associations between them
48002
Display initial resources in respective viewing components
48004
Display user interface for navigating between resources
48006
Detect selection of navigation user interface element to navigate to a new resource in first viewing component
48008
Initiate navigation to new resource in first viewing component
48010
Detect resources associated with new resource
48012
Initiate navigation to an associated resource in second viewing component
48014

FIG. 49

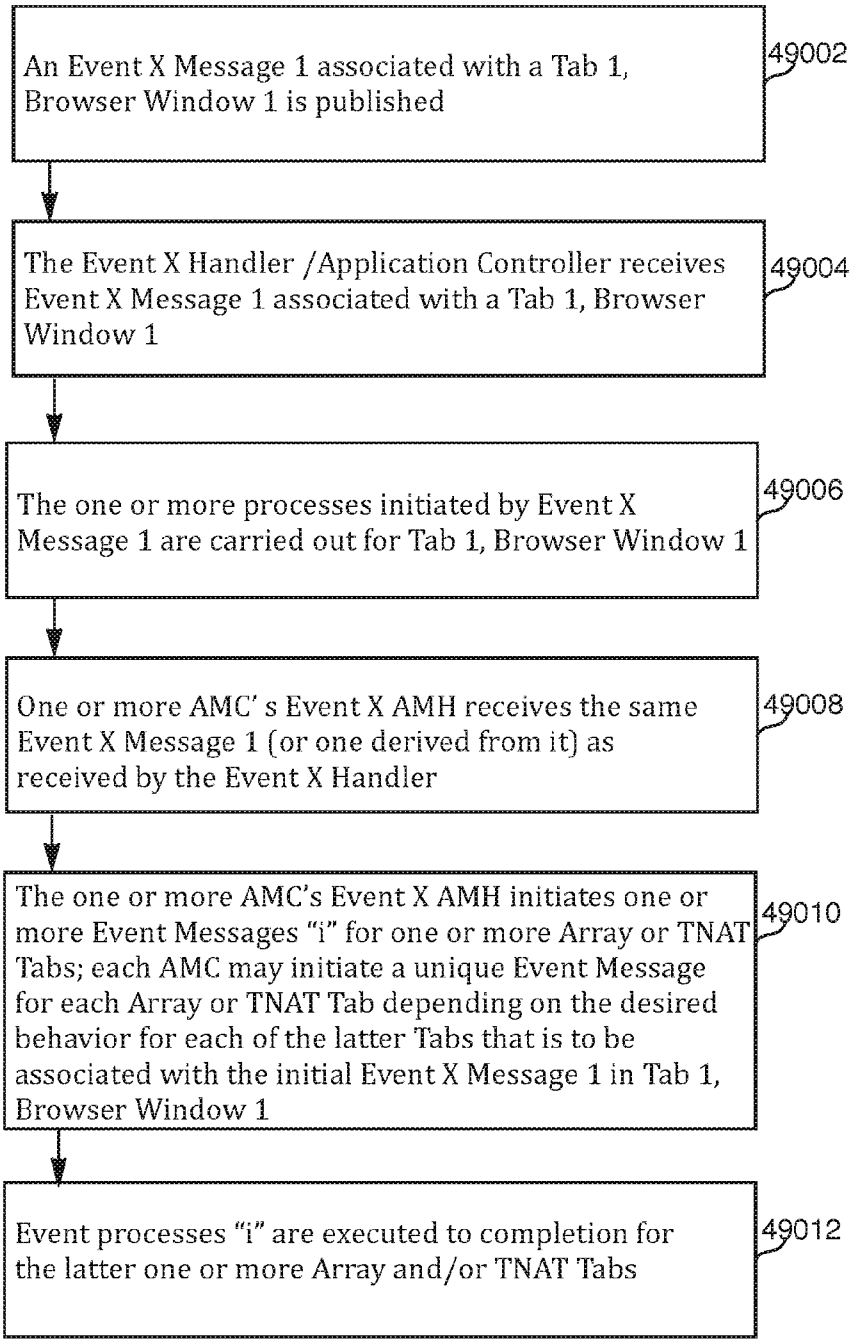

An Event X Message 1 associated with a Tab 1, Browser Window 1 is published
49002
The Event X Handler /Application Controller receives Event X Message 1 associated with a Tab 1, Browser Window 1
49004
The one or more processes initiated by Event X Message 1 are carried out for Tab 1, Browser Window 1
49006
One or more AMC' s Event X AMH receives the same Event X Message 1 (or one derived from it) as received by the Event X Handler
49008
The one or more AMC's Event X AMH initiates one or more Event Messages "i" for one or more Array or TNAT Tabs; each AMC may initiate a unique Event Message for each Array or TNAT Tab depending on the desired behavior for each of the latter Tabs that is to be associated with the initial Event X Message 1 in Tab 1, Browser Window 1
49010
Event processes "i" are executed to completion for the latter one or more Array and/or TNAT Tabs
49012

FIG. 50

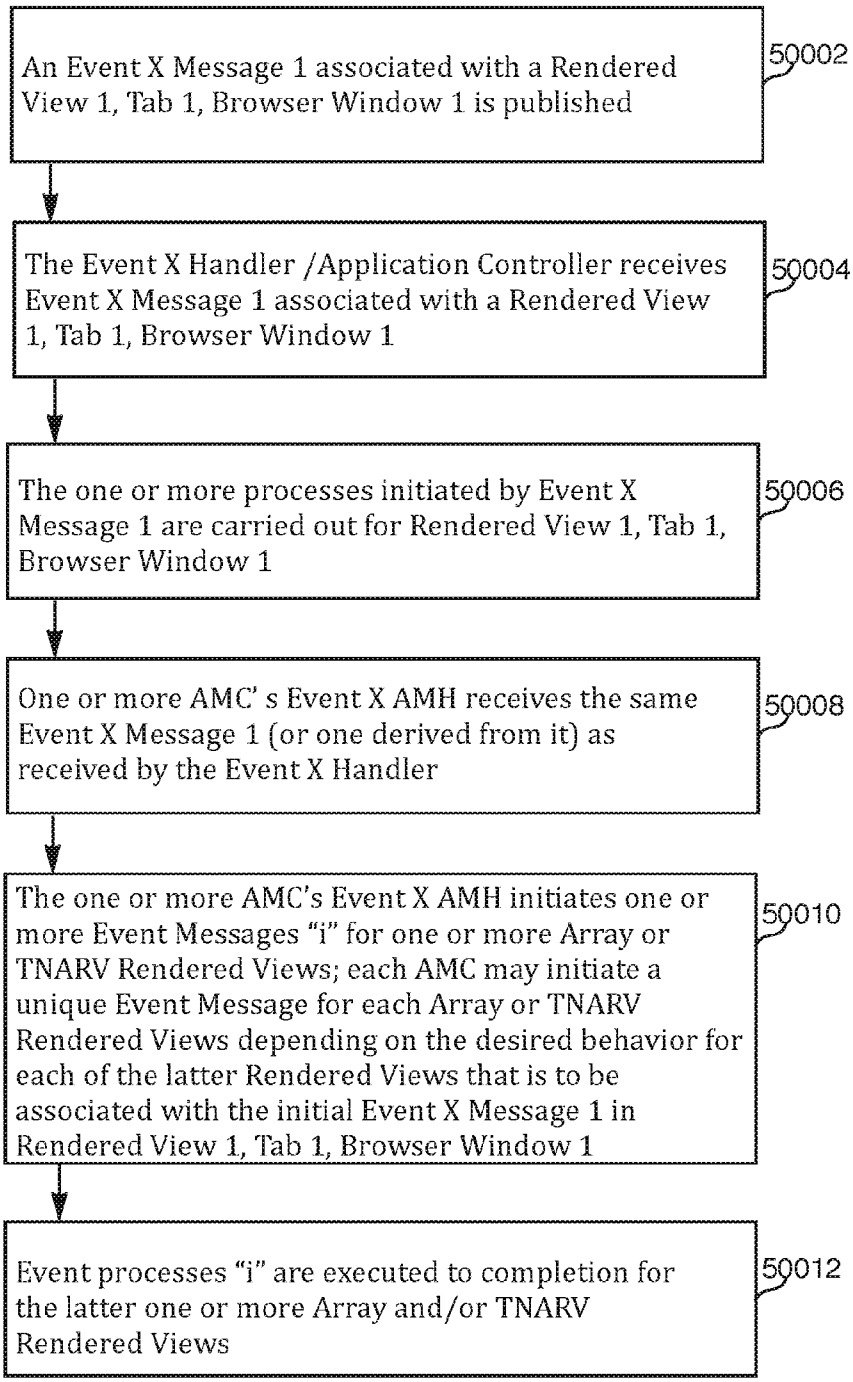

An Event X Message 1 associated with a Rendered View 1, Tab 1, Browser Window 1 is published
50002
The Event X Handler /Application Controller receives Event X Message 1 associated with a Rendered View 1, Tab 1, Browser Window 1
50004
The one or more processes initiated by Event X Message 1 are carried out for Rendered View 1, Tab 1, Browser Window 1
50006
One or more AMC' s Event X AMH receives the same Event X Message 1 (or one derived from it) as received by the Event X Handler
50008
The one or more AMC's Event X AMH initiates one or more Event Messages "i" for one or more Array or TNARV Rendered Views; each AMC may initiate a unique Event Message for each Array or TNARV Rendered Views depending on the desired behavior for each of the latter Rendered Views that is to be associated with the initial Event X Message 1 in Rendered View 1, Tab 1, Browser Window 1
50010
Event processes "i" are executed to completion for the latter one or more Array and/or TNARV Rendered Views
50012

FIG. 51

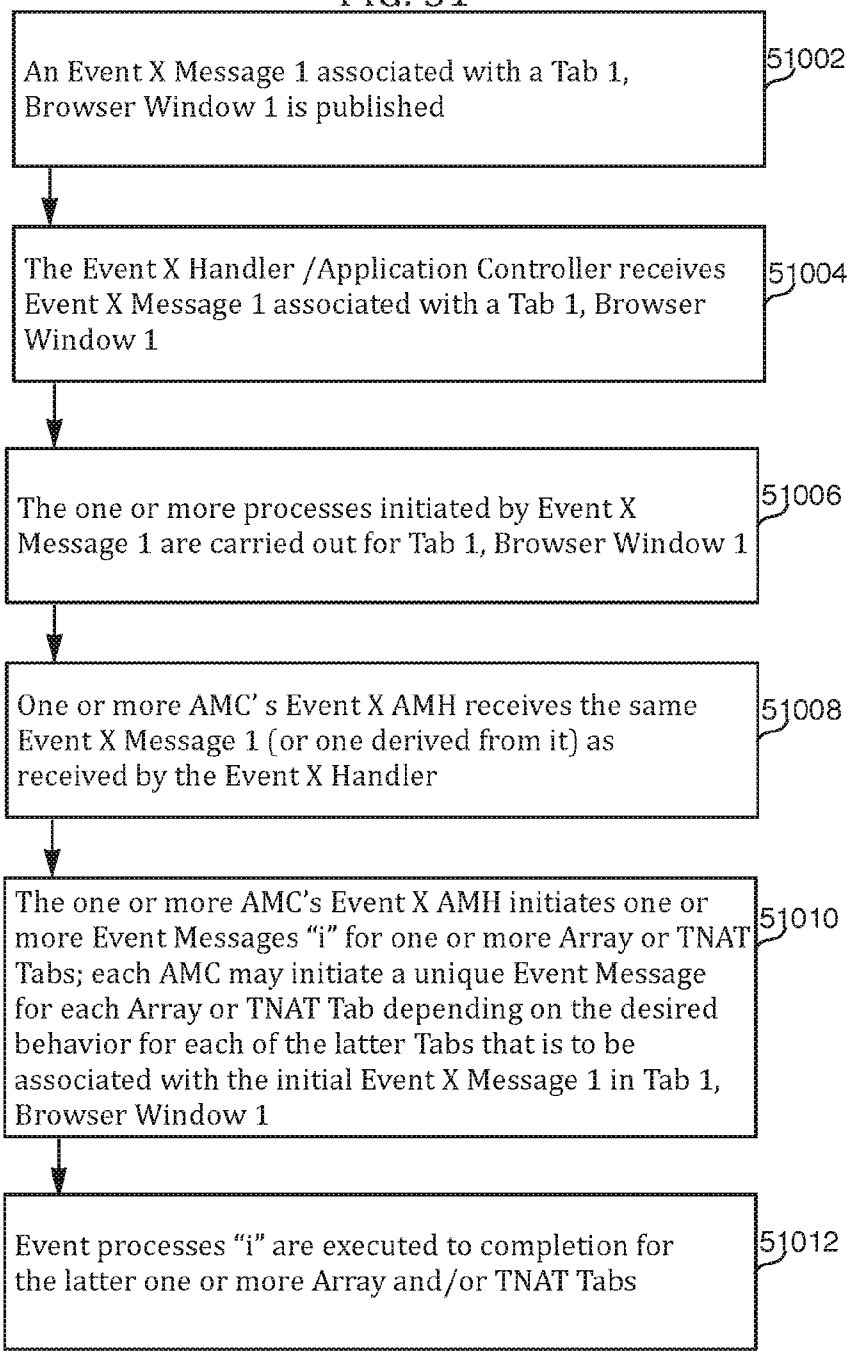

An Event X Message 1 associated with a Tab 1, Browser Window 1 is published
51002
The Event X Handler /Application Controller receives Event X Message 1 associated with a Tab 1, Browser Window 1
51004
The one or more processes initiated by Event X Message 1 are carried out for Tab 1, Browser Window 1
51006
One or more AMC' s Event X AMH receives the same Event X Message 1 (or one derived from it) as received by the Event X Handler
51008
The one or more AMC's Event X AMH initiates one or more Event Messages "i" for one or more Array or TNAT Tabs; each AMC may initiate a unique Event Message for each Array or TNAT Tab depending on the desired behavior for each of the latter Tabs that is to be associated with the initial Event X Message 1 in Tab 1, Browser Window 1
51010
Event processes "i" are executed to completion for the latter one or more Array and/or TNAT Tabs
51012

FIG. 52

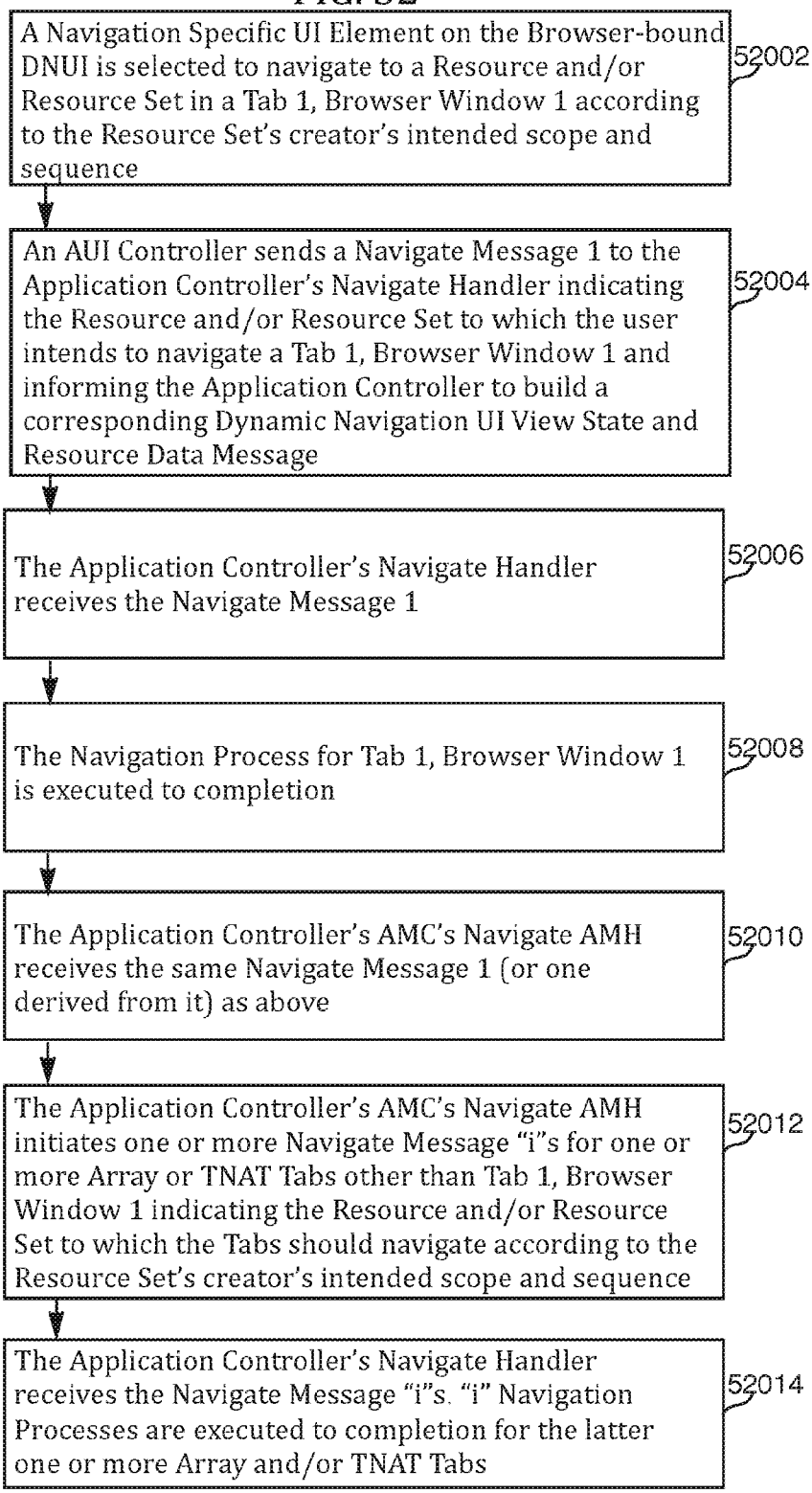
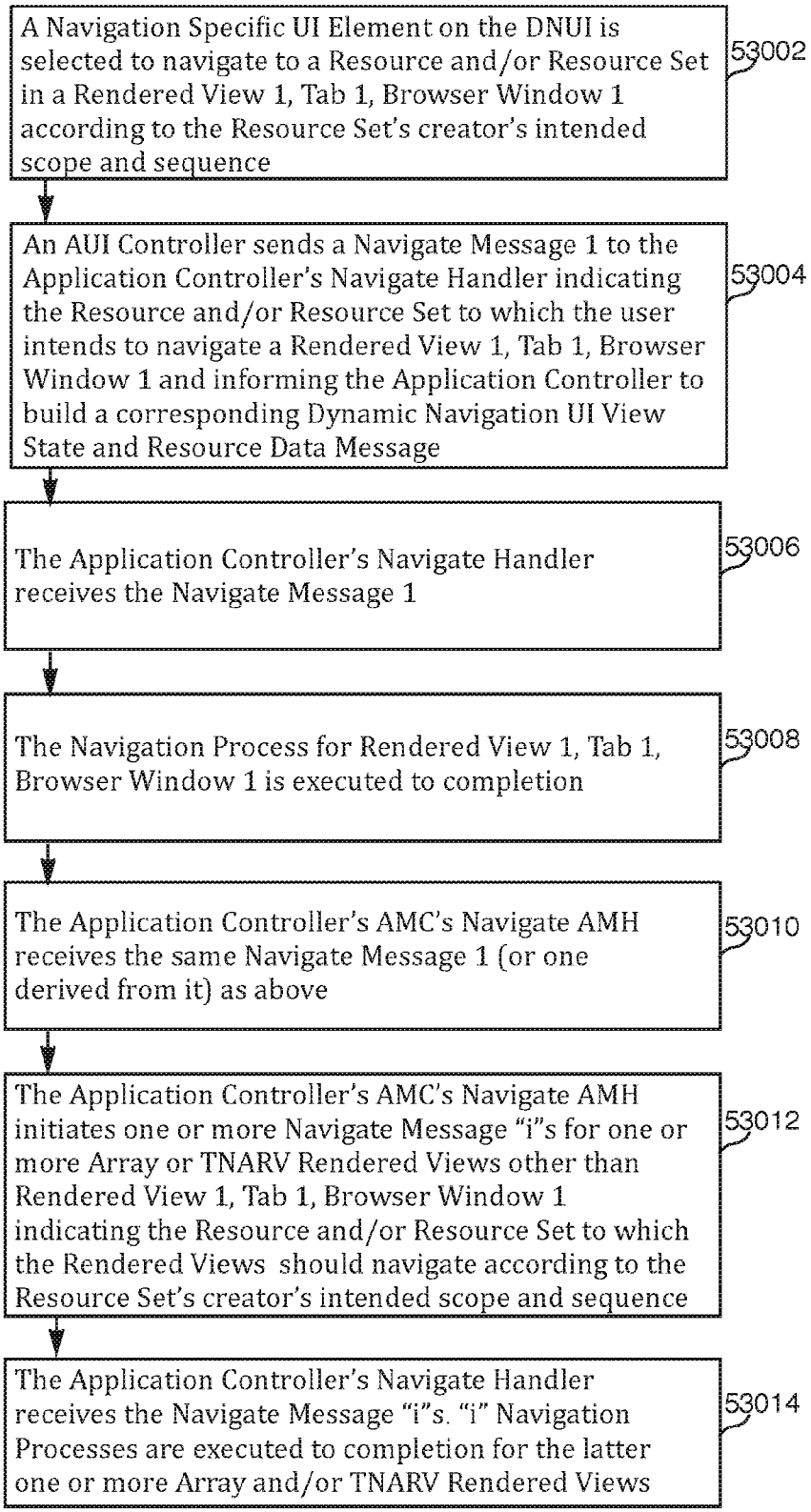

A Navigation Specific UI Element on the Browser-bound DNUI is selected to navigate to a Resource and/or Resource Set in a Tab 1, Browser Window 1 according to the Resource Set's creator's intended scope and sequence
52002
An AUI Controller sends a Navigate Message 1 to the Application Controller's Navigate Handler indicating the Resource and/or Resource Set to which the user intends to navigate a Tab 1, Browser Window 1 and informing the Application Controller to build a corresponding Dynamic Navigation UI View State and Resource Data Message
52004
The Application Controller's Navigate Handler receives the Navigate Message 1
52006
The Navigation Process for Tab 1, Browser Window 1 is executed to completion
52008
The Application Controller's AMC's Navigate AMH receives the same Navigate Message 1 (or one derived from it) as above
52010
The Application Controller's AMC's Navigate AMH initiates one or more Navigate Message "i"s for one or more Array or TNAT Tabs other than Tab 1, Browser Window 1 indicating the Resource and/or Resource Set to which the Tabs should navigate according to the Resource Set's creator's intended scope and sequence
52012
The Application Controller's Navigate Handler receives the Navigate Message "i"s. "i" Navigation Processes are executed to completion for the latter one or more Array and/or TNAT Tabs
52014

FIG. 53


A Navigation Specific UI Element on the DNUI is selected to navigate to a Resource and/or Resource Set in a Rendered View 1, Tab 1, Browser Window 1 according to the Resource Set's creator's intended scope and sequence
53002
An AUI Controller sends a Navigate Message 1 to the Application Controller's Navigate Handler indicating the Resource and/or Resource Set to which the user intends to navigate a Rendered View 1, Tab 1, Browser Window 1 and informing the Application Controller to build a corresponding Dynamic Navigation UI View State and Resource Data Message
53004
The Application Controller's Navigate Handler receives the Navigate Message 1
53006
The Navigation Process for Rendered View 1, Tab 1, Browser Window 1 is executed to completion
53008
The Application Controller's AMC's Navigate AMH receives the same Navigate Message 1 (or one derived from it) as above
53010
The Application Controller's AMC's Navigate AMH initiates one or more Navigate Message "i"s for one or more Array or TNARV Rendered Views other than Rendered View 1, Tab 1, Browser Window 1 indicating the Resource and/or Resource Set to which the Rendered Views should navigate according to the Resource Set's creator's intended scope and sequence
53012
The Application Controller's Navigate Handler receives the Navigate Message "i"s. "i" Navigation Processes are executed to completion for the latter one or more Array and/or TNARV Rendered Views
53014

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 16/58720

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 3/00 (2016.01)
CPC - H04L 29/0809; G06F 17/30873; G06Q 30/02
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8): G06F 3/00 (2016.01)
CPC: H04L 29/0809; G06F 17/30873; G06Q 30/02

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
IPC(8): G06F 3/00 (2016.01); CPC: H04L 29/0809; G06F 17/30873; G06Q 30/02; G06F 17/30899; H04L 29/08072; USPC: 715/738; 715/733; 715/748 (keyword limited; terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
resource management navigation application client ordered set displayed associated viewing component user interface navigating between detected responsive positioned over area

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2013/0305184 A1 (Kim et al.) 14 November 2013 (14.11.2013), entire document especially abstract; Fig. 3B, 6A to 6E. 9, 12, 15A to 15C, 16C to 16E; para [0015]-[0020], [0038], [0070]-[0089], [0195]-[0230], [0250]-[0275]	1-45
Y	US 2012/0030664 A1 (Demant et al.) 02 February 2012 (02.02.2012), entire document especially Fig 1; para [0015]-[0018], [0030], [0038], [0069]-[0075], [0084], [0088], [0095], [0099], [0109]	1-45
A	US 2010/0079392 A1 (Chiang et al.) 01 April 2010 (01.04.2010), entire document	1-45

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
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"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
14 December 2016	19 JAN 2017
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774