APPARATUS AND METHODS FOR INTERACTING WITH MULTIPLE INFORMATION FORMS ACROSS MULTIPLE TYPES OF COMPUTING DEVICES

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims the benefit of U.S. Provisional Patent Application Serial No. 61/052,765 filed May 13, 2008, and entitled SYSTEM AND METHOD FOR CONDUCTING BUSINESS IN A VIRTUAL WORLD OR METAVERSE, which is herein incorporated by reference in its entirety.

BACKGROUND

1. Field of Invention

[0002] Embodiments of the present invention relate generally to user-centric information convergence and, more particularly, to apparatus and methods for interacting with multiple information forms across multiple types of computing devices and platforms.

2. Description of the Related Art

[0003] Significant strides have been made in creating digital/digitized content of many varieties, including text, graphics, pictures, video, streaming real-time video, remote device control/interaction, three dimensional ("3D") graphic visualization of objects and digital sound.

[0004] Dissimilar evolutions of device interfaces on platforms such as computer desktop/laptop screens, mobile devices, and special use displays have created many content interaction metaphors. Users have had to accept that these different physical devices require expertise in

each format to make them useful. Information utility has grown and similar content can now be accessed from dissimilar devices but with differing access methods and metaphors.

[0005] Browsers were the Internet's early solution to creating a "window" or "portal" onto personalizable content to manage the proliferation and exponentially expanding amount of electronically available information. Some consumer interface technologies have focused on simplification and ease of use. These technologies (ex. Google® or Apple® products) utilize icons and simple text entry to improve usability and simplicity while utilizing sophisticated computing methods to keep the users' display of information to a minimum. These technologies largely remain text or two-dimensional ("2D") graphic-centric.

[0006] 3D data visualization methods have been limited to narrow deployment largely in the technical Computer Aided Design ("CAD") fields where sophisticated users with specialized training manipulated specialized applications. Advances in 3D gaming technologies have created low cost and mass availability of sophisticated visualization, sound and animation of information, however they lack useful business application due to their primary focus on the user/player's point-of-reference. Gaming technologies treat objects within the 3D framework for visual reference and are poorly suited for complex and cross platform information management solutions.

[0007] Therefore, there is a need for a solution that addresses the above and other problems.

BRIEF SUMMARY OF THE INVENTION

[0008] Aspects of the present invention provide a system, method, and computer program product for interacting with multiple information forms across multiple types of computing

devices, including interactive displays and communication devices, without the shortcomings of previous systems. A system, method, and computer program product in accordance with the present invention may employ a universal grid of channels to engage in context relevant interactions with any type of content and the content's representation as a selectable item, such as a graphic, picture, video, and the like.

[0009] According to an aspect of the invention, a computer-readable storage media is provided for interacting with multiple information forms across computing devices. The computer-readable storage media may include computer-readable instructions configured to cause one or more computer processors to execute the operations including authenticating a user, establishing a channel grid framework for the user on a first platform where the channel grid framework provides access to a first computer application displayed on a display device as a channel. The computer-readable storage media may further include computer-readable instructions configured to cause one or more computer processors to also execute the operations including deploying the channel from the channel grid framework on the first platform to a second platform in response to a user selecting the channel from the channel grid framework on the first platform and performing a copy operation of the channel to the second platform and establishing a run time application of the first computer application on the second platform.

[0010] These and other advantages, aspects, and features of the present invention will become more apparent from the following detailed description of embodiments and implementations of the present invention when viewed in conjunction with the accompanying drawings. The present invention is also capable of other embodiments and different embodiments, and details can be modified in various respects without departing from the spirit and scope of the present

invention. Accordingly, the drawings and descriptions below are to be regarded as illustrative in nature, and not as restrictive.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The accompanying drawings illustrate an embodiment of the invention and depict the above-mentioned and other features of this invention and the manner of attaining them. In the drawings:

[0012] FIG. 1 illustrates a block diagram of a system for conducting business in a virtual world in accordance with an embodiment of the present invention.

[0013] FIG. 2 illustrates a block diagram of a system and method for interacting with multiple information forms across multiple types of platforms in accordance with an embodiment of the present invention.

[0014] FIG. 3 illustrates a schematic representation of a computer display device displaying a channel grid framework in accordance with an embodiment of the present invention.

[0015] FIG. 4 illustrates a flowchart of an exemplary method of interacting with a channel in accordance with an embodiment of the present invention.

[0016] FIG. 5 illustrates a flowchart of a method of transferring a channel from a first platform to a second platform in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION

[0017] The following detailed description of the invention refers to the accompanying drawings and to certain preferred embodiments, but the detailed description does not limit the invention.

The scope of the invention is defined by the appended claims and equivalents as it will be apparent to those of skill in the art that various features, variations, and modifications can be included or excluded based upon the requirements of a particular use.

[0018] As used in this application, the terms "a", "an" and "the" may refer to one or more than one of an item. The terms "and" and "or" may be used in the conjunctive or disjunctive sense and will generally be understood to be equivalent to "and/or." For brevity and clarity, a particular quantity of an item may be described or shown while the actual quantity of the item may differ, and features from one embodiment may be combined with features of another embodiment. By way of non-limiting example, various components (e.g., channel grid framework 101, content channels 202, and the like) are described and shown, which may perform various functions and interact with each other. These components may be segregated based on their function merely for the sake of description and may represent computer hardware and executable software code which may be stored on a computer-readable storage medium for execution on appropriate computing hardware. The various functions of the different components may be combined or segregated as hardware or software stored on a computer-readable medium in any manner, and may be used separately or in combination.

[0019] As can be appreciated from the above discussion, electronic information users are confronted with ever increasing amounts of data. Information technologies are moving beyond traditional computing terminals and equipment onto mobile, television and other special-use displays. Dissimilar formats compounded with increasing amounts of digital content are overwhelming users with data. Information users are now wasting their time locating, putting into context, consolidating, managing multiple versions of, and understanding what is truly

meaningful. Users then spend insufficient time contemplating contexts and acting on the information. Inefficiency is increasing and productivity declining. Consumers have a problem meaningfully understanding and efficiently consuming the vast amount of content.

[0020] In accordance with an embodiment of the present invention, a common and efficient utility may be provided to interact with multiple information forms across multiple types of computers, interactive displays, and communication devices ("platforms"), in a more effective and efficient manner. Users may define the type and manner of delivery of information. The term "information" should be broadly interpreted to include, by way of non-limiting example, any appropriate type of content or data. Non-limiting examples may include text, graphics, pictures, video, streaming real-time video, remote device control/interaction, 3D graphic visualization of objects, and digital sound. Likewise, the phrase "information forms" as used herein is intended to be synonymous with "information." The term "platforms" should be broadly interpreted to include, by way of non-limiting example, computers, communication devices, and other computing devices. Non-limiting examples include servers, networks of servers, desktop computers, laptop computers, tablet computers, net-book computing devices, telephones, cell phone devices, handheld devices, smart phones, interactive displays, personal digital assistants (PDAs), portable digital assistants, enterprise digital assistants, personal navigation devices, network connected devices, Blu-ray players (or other optical disk players with network access), in-vehicle devices, televisions (set top boxes), virtual machines, and game consoles. Likewise, the term devices used herein is intended to be synonymous.

[0021] Information may be delivered to a user based on the user's identity as established by the system when the user's session is established. Because the user is known and authenticated, preferences and rights to certain information types can be defined and managed for the user.

[0022] Information relevant to the user may be presented in, by way of non-limiting example, a twelve item grid in the form of "channels." These channels may be preconfigured and may contain any information format. Non-limiting examples include streaming video, audio, voice-over-IP communication, environmental monitoring information, financial services information, enterprise resource planning information, building information modeling, product lifecycle management information, project management information, immersive 3D environments, video conferencing information, RSS reader information, channel application repository information, end-user preferences and localization information, word processing documents, spreadsheets, presentation/slide shows, email, address book information, instant messaging information, enterprise content management information, text, graphics, pictures, video, , remote device control/interaction, and 3D graphic visualization of objects. Each channel may be configured to perform complex functions both in how the information is synthesized and delivered as well as what the user may do with it (as may be driven by the identify and authorization granted to the user). The channels may be represented in 2D or 3D form across multiple types of platforms.

[0023] The assignment of information priority, event alerts or triggers, and complex actions that can result from the user's interaction with a channel may be built upon and exploited by developers. A development tool or facility may be provided to a developer to create many forms of customization. Triggers may be parameterized against information behavior. Non-limiting examples of triggers may include exceeding a quantified numerical limit and multiple

similar events trending in a certain direction. The trigger may cause the information channel to change its appearance or to take other actions that may be implemented by the developer. By way of non-limiting example, one action that may be implemented is to provide a notification to the user.

[0024] With respect to the information in a channel, the user may take action by touching, clicking, or otherwise interacting with the channel. Based on the access rights assigned to an individual and the underlying actions enabled through the channel's design, immediate response to an event or a complex logic chain that formed the event may occur. In some instances, the information may require deeper understanding, in which case the channel may expand to more channels, more information, or into a 3D form to aid rapid and effective understanding.

[0025] 3D representation of objects and other users may be available seamlessly to facilitate context relevant interaction with an easy-to-understand representation of a physical place, object, people, or other users. Touching, clicking, or otherwise interacting with objects or participating users may enable conditional logic to drive further visualization or actions. Events and actions may be carried out from two dimensions to be viewed within a 3D representation. Objects may appear to live in this virtual or representative world (meta-verse) indefinitely on demand from digital representations that may exist in databases as needed.

[0026] FIG. 1 illustrates a block diagram of a system 100 for conducting business in a virtual world in accordance with an embodiment of the present invention. The system 100 may include a channel grid framework 101, a web services gateway 107, a virtual world server 109, and enabled applications and services 120. The channel grid framework 101 may be connected to

the web services gateway 107. The web services gateway 107 may be connected to the channel grid framework 101, the virtual world server 109, and enabled applications and services 120. The virtual world server 109 may be connected to the enabled applications and services 120. The enabled applications and services 120 may be connected to the web services gateway 107 and the virtual world server 109.

[0027] FIG. 2 illustrates a block diagram of a system 200 for interacting with multiple information forms across multiple types of platforms in accordance with an embodiment of the present invention. The system 200 may include multiple components. As noted above, the various functions of the different components may be combined or segregated as hardware or software. By way of non-limiting example, the components may exist on or as servers or networks of servers, services, or devices. The components may exist in a service-oriented architecture (SOA) that enables each component to exist as a logical component. Similarly, the components may exist on other computers, communication devices, and other computing devices such as desktop computers, laptop computers, mobile telephones, interactive displays, portable digital assistants (PDAs), other network-connected devices, Blu-ray players, in-vehicle devices, televisions, and the like. The system 200 may include a channel grid framework 201, content channels 202, and an application host and transfer tool 203. The application host and transfer tool 203 may include transfer icon #1 mobile device 204, transfer icon #2 television 205, and transfer icon #3 other device type 206. Of course, additional transfer icons may be included as desired. The system 200 may further include a web services gateway 207 and an identity management server 208.

[0028] The channel grid framework 201 may be connected to the content channels 202 and the web services gateway 207 through a system bus (not shown) or any suitable network or communication connection. Similarly, the content channels 202 may be connected to the application host and transfer tool 203. The application host and transfer tool 203 may be connected to the transfer icon #1 mobile device 204, the transfer icon #2 television 205, and the transfer icon #3 other device type 206. As noted above, the channel grid framework 201 may be connected to the web services gateway 207. The web services gateway 207 may be connected to the identity management server 208.

[0029] The system 200 may further include a virtual world server 209, an enterprise service bus 210, a channel alert server 211, a channel server 212, a video server 213, an enterprise content management server 214, a device integration server 215, and a portal server 216. The system 200 may further include telecommunications network services 217, an Internet multimedia services gateway 218, and multiple databases 219.

[0030] The identity management server 208 may be connected to the virtual world server 209, the enterprise service bus 210, the channel alert server 211, the channel server 212, the video server 213, the enterprise content management server 214, the device integration server 215, and the portal server 216. Each of the virtual world server 209, the enterprise service bus 210, the channel alert server 211, the channel server 212, the video server 213, the enterprise content management server 214, the device integration server 215, and the portal server 216 may be connected to one another. The enterprise service bus 210 may be connected to the Internet multimedia services gateway 218, which may be connected to the telecommunications network services 217. The channel alert server 211, the channel server 212, the video server 213, the

enterprise content management server 214, the device integration server 215, and the portal server 216 may each be connected to multiple databases 219.

[0031] In addition to FIG. 2, attention is now directed to FIG. 3, which illustrates a schematic representation of a computer display device 300 displaying the channel grid framework 201 in accordance with an embodiment of the present invention. The channel grid framework 201 may be a hardware device or a software application that displays a twelve channel display layout on a hardware device, such as a computer display device 300. The channel grid framework 201 may be delivered as a web-based browser software application or as a standalone application. Any type of information or content may be assigned to any channel 202. The channel may be displayed on multiple platforms. Although the channel grid framework 201 may display twelve channels 202, the grid may display a larger or smaller number of channels 202. The channel grid framework 201 may include a three-by-four (3x4) matrix of square elements. Although the channel grid framework 201 may include a three-by-four matrix of square elements, different configurations may be substituted. The channel grid framework 201 may also provide development, display, security, integration, and related feature implementation of services delivered through and coupled with the web-services gateway 207, where the actual command structure, business logic, and functions of specific channels 202 may be integrated from subordinate application functions as supported by the virtual world server 209, the enterprise service bus 210, the channel alert server 211, the channel server 212, the video server 213, the enterprise content management server 214, the device integration server 215, the portal server 216, the telecommunications network services 217, the Internet multimedia services gateway 218, and multiple databases 219.

[0032] Each of the channels 202 may be representative of any form of information or content. Non-limiting examples include static icons which may activate further functions and full motion multimedia. An unlimited number of direct commands, access to subordinate grids or functions may be assigned to the channel 202 by a developer. A user may access specific channels 202 and interact with them based on the user's profile that has been established and is managed by the identity management server 208. A channel 202 may be developed through the use of services available to the developer. The use of these services may include web services gateway 207, identity management server 208, virtual world server 209, the enterprise service bus 210, the channel alert server 211, the channel server 212, the video server 213, the enterprise content management server 214, the device integration server 215, the portal server 216, and the Internet multimedia services gateway 218. The channel information (e.g., content), enabling alerts, and integration to these services may reside in multiple databases 219.

[0033] The application host and transfer tool 203 may be a separate software application that may be installed on a specific hardware device such a computer, communication device, or other computing device. Non-limiting examples include a server, a network of servers, a desktop computer, a laptop computer, a tablet computer, a net-book computing device, a telephone, a cell phone device, a handheld device, a smart phone, an interactive display, a personal data assistant (PDA), an enterprise digital assistant, a personal navigation device, a network connected device, a Blu-ray player (or other optical disk player with network access), an in-vehicle device, a set-top box (television), a virtual machine, a game console, and the like. The application host and transfer tool 203 may allow for individual channels residing in the desktop channel grid framework 201 to be "dragged and dropped" (by, as a non-limiting

example, clicking, holding, moving and releasing) out of the desktop channel grid framework 201 and into the application host and transfer tool 203. The dropping of a channel 202 on the application host and transfer tool 203 may trigger a server event that may download a copy of the channel into the application host and transfer tool 203. Once the channel 202 is installed onto the application host and transfer tool 203, the channel may then be an independent entity, the desktop channel grid framework 201 can be closed, and the channel(s) 202 residing in the application host and transfer tool 203 can be utilized. Channels 202 residing in the application host and transfer tool 203 can be transferred to other registered devices or platforms (such as from a desktop computer to a mobile telephone) by "dragging and dropping" the channel 202 on top of one the registered device icons located on, by way of non-limiting example, the application host and transfer tool 203 dock. The drag and drop event may trigger a download of the device specific application to the intended device or platform. Channels 202 residing in the application host and transfer tool 203 may also be "dragged" outside of the application host and transfer tool 203 onto the device "desktop" and be interacted with. All functions and features may remain operable and synchronized across all registered devices or platforms invoked through the transfer command for 204, 205 and 206 through the web services gateway (207) in a manner similar to the channel grid framework's 201 instantiation. The channel 202 may then appear in the channel grid framework 201 and on the desktop 301. Functions and features of the channel 202 remain operable and synchronized across all registered platforms invoked through the copy or transfer command through the web services gateway 207 to the channel server 212 and channel alert server 211 to allow full engagement of the functions provided by the channel 202.

[0034] Transfer icon #1 mobile device 204, transfer icon # 2 television 205, and transfer icon # 3 other device type may each be a hardware device or software application. If a selected channel 202 exists in the application host transfer tool 203, the channel 202 may be moved to a transfer icon through a drag and drop instruction. During a drag and drop function, the channel 202 may be transformed to become available on a selected platform (e.g., a mobile device). During an initial configuration of channels 202, a user profile may be established which may identify user preferences, platform identities, and service support instructions as to how the user wishes information to behave on the selected platform. The selected platform may need to be electronically connectable such as through the Internet, close over-the-air mechanism (e.g., Bluetooth®), or through a wired connection. When the channel 202 appears on the selected platform, it may retain all of its original native functionality from the channel grid framework 201 if it has been configured or programmed to do so. The application host and transfer tool 203 transfer icons 204, 205, 206 may serve as trigger mechanisms, each to activate a channel download to a specific, registered device or platform. The download may be activated by a drag and drop of an application host and transfer tool 203 in which channel 202 application resides onto a transfer icon 204, 205, 206, which, in turn, may send the download request to a remote server application where the appropriate and device or platform specific application may be downloaded to the requesting device or platform.

[0035] The web services gateway 207 may be an Internet-based hardware device or software tool through which the channel grid framework 201 may interact with external applications and services. When a user selects a specific channel 202 an instruction from the channel grid framework 201 may pass through the web services gateway 207 to interact with the identity

management server 208. A user may be authenticated along with the registries to all services, applications, and information that may be involved with that performance of the function of channel 202. Once authenticated, the request for activity may be processed by one or more of the enterprise service bus 210, the channel alert server 211, the channel server 212, the video server 213, the enterprise content management server 214, the device integration server 215, the portal server 216, the Internet multimedia services gateway 218, the virtual world server 209 and the multiple databases 219. The information or service function to be performed or processed may then be processed back through the identity management server 208 for authorization, then transformed back into the channel characterization as defined in the channel grid framework 201 and displayed as a channel 202.

[0036] The identity management server 208 may be a hardware device or software application that may provide user, application, device, location, equipment and information authentication. When a channel 202 is initially created, the application and its information access and security protocols that are required may be identified. When a user is associated with a channel 202 or specific services that may be enabled by the channel 202, access and security protocols may be identified for each condition and action to be performed by the user. This information may be stored in a secure and specific database 219. Every time the channel 202 is invoked or interrogated, both the security of the applications affected as well as the security of the user may be confirmed. Once authorized, the channel 202 services may be performed, and the content provided by the computer application on the channel 202 may be evaluated. The interrogation of the channel 202 may be bi-directional, where the channel 202 may interrogate the identity management server 208 to evaluate content and determine if the channel 202

services are available, and similarly, the identity management server 208 and the web services gateway 207 may be configured to interrogate the channel 202 in the channel grid framework 201 to evaluate content provided by the first computer application.

[0037] The virtual world server 209 may be a 3D software application or a device and may be used to provide visualization of information, command actions, or functions, and collaboration among electronically-connected participants. By way of non-limiting example, teleconference attendees may be visualized as floating orbs. Other users on separate platforms may also serve as video conference attendees. Within the virtual world server 209, an instantaneous visualization of objects in 3D may serve as a method to access information as well as an ability to command actions, or perform functions. These objects may each have associated data or metadata attached. When the user interacts (by way of non-limiting example by touching, clicking, or performing other commands) with an object, the virtual world server 209 may access the data or metadata or a related application as desired by the developer. All interactions with information, command actions, or functions may pass through the identity management server 208 and the web services gateway 207, and may be displayed in native applications or through a channel 202.

[0038] The enterprise services bus 210 may be a hardware device or software application that may manage multiple information control, application integration, and user enabled instructions. It may be the primary integration utility to all applications, information and communications. When a developer creates a channel's 202 business logic, associated commands, information transactions, user class entitlements and workflow, they may be stored in databases 219. The enterprise service bus 210 may call the instructions and information from

these databases 219 and enable the command to be serviced and the action requirements to be satisfied.

[0039] The channel alert server 211 may be a hardware device or software application that may continually monitor application and information activities defined by a channel. By way of non-limiting example, a user or developer may define threshold conditions with definitive values assigned to events, conditions, logical workflows, discrete information values or signal data. If an established condition is met, the channel alert server 211 may notify the identity management server 208 to confirm the subscriber of the event, determine the active devices of the subscriber, and then pass through the web services gateway 207 and the channel grid framework 201 to provide a visual or auditory alert in the channel 202. Likewise, the alert may trigger additional actions affecting the channel 202 and the underlying computer application. For example, a channel may be established to monitor an alarm condition of a business or residence. If a condition at the business or residence triggers an alarm, an additional alert action such as notifying a law enforcement agency or a protective services group may be triggered. The alert can appear as defined on other platforms such as a mobile device, a television (set top box), a Blu-ray player, or other devices.

[0040] The channel server 212 may be a hardware device or a software application which may define the visual characterization, functions, information, and features of a channel 202. The channel description and all related information may be stored in databases 219. All channels may be stored in a channel repository located within the channel server 212. When a channel 202 is added to the channel grid framework 201 or the application host and transfer tool 203, software calls or hardware signals may be made to the channel server 212 to request a device

specific download action to be performed. The download may occur over, by way of non-limiting example, wired/wireless Internet via TCP-IP, Bluetooth, or local cable via USB cable. This action may route through the enterprise service bus 210 based on logic associated to the channel 202. Specific actions and information to be displayed may be served or serviced through the identity management server 208, and on to the target device.

[0041] The video server 213 may be a hardware device or software application that may provide application services to transform, transmit, and support the delivery of information in the form of video and audio. The channel server 212, enterprise content management server 214, and databases 219 may be accessed by the video server 213 for content.

[0042] The enterprise content management server 214 may be a hardware device or a software application that may provide primary configuration, templates, user interface controls and management control over the information displayed on a channel 202. The originating application data from all applications that are invoked through a channel call may route through the enterprise content management server 214. All images, charting, icons, artwork and other forms of digital art that make up the user experience may be stored in the enterprise content management server repository 214. Metadata associated with the request, action, data, user, and time may be managed in an associated database 219.

[0043] The device integration server 215 may be a hardware device or software application that may manage the connection between a channel 202 and any application or information source containing streaming or real-time information from a machine or device. The device integration server 215 may support the interchange of Internet protocol based information commands. A user invoking a channel 202 associated with this information type, and authorized to do so by

the identity management server 208, whether displayed in the virtual world server 209 or directly to the channel 202, may command a function. By way of non-limiting example, a user may send a command to an actual physical thermostat in the actual physical world as a display in the virtual world server. The device integration server may store real-time data captured from devices in multiple databases 219 for later retrieval.

[0044] The portal server 216 may be a hardware device or software application that may facilitate Internet function access by the web services gateway 207. This utility may be used to call other Internet-based functions and services by the web services gateway 207.

[0045] The telecommunications network services 217 may provide content distribution and retrieval services for channels 202 through telecommunication wireline and wireless services.

[0046] The enterprise service bus 210 may send all data traffic requests to applications, services and systems.

[0047] The Internet multi-media services gateway 218 may serve as the specific implementation of network traffic protocols, applications and services to specific telecommunications providers.

[0048] The databases 219 may exist to manage commands, applications, information, and user profiles.

[0049] The operation of the system 200 for interacting with multiple information and data forms across multiple types of computers, interactive displays, communication devices, and computing devices is now described with reference to FIGS. 4 and 5.

[0050] FIG. 4 is a flowchart of an exemplary method 400 of interacting with a channel. In operation 402, the method 400 may begin. In operation 404, a user may be authenticated. The user may initiate the channel grid framework 201, and provide authentication data. The

authentication data may pass through the web services gateway 207 to the identity management server 208 for authentication.

[0051] After authenticating the user in operation 404, the channel grid framework 201 may be established for the user on a first platform or device in operation 406. The channel grid framework 201 may display twelve channels 202. A channel 202 may be representative of any form of information or content. As a non-limiting example, the channel 202 may represent a temperature in a specific building as measured by a thermostat sensor. In displaying the channel 202, the channel 202 may be authenticated by the identity management server 208.

[0052] In operation 408, the user may determine whether to transfer the channel 202 from the first platform or device to a second platform or device. If the user determines to transfer the channel 202 from the first platform or device to the second platform or device, operation 418 may be performed and the channel 202 may be deployed from the first platform or device to the second platform or device by selecting the channel 202 and dragging that channel 202 from the channel grid framework 201. The selection and dragging of the channel 202 may be according to the method shown in FIG. 5 and discussed below. The method 400 may return to operation 408. If in operation 408 the user does not determine to transfer the channel 202, the method 400 may proceed to operation 410.

[0053] In operation 410, the user may determine whether to interact with a 3D digital instance of a physical object in a 3D workspace to access information related to the physical object. If the user determines to interact with the 3D digital instance of the physical object in the 3D workspace, operation 420 may be performed. The user may be presented with the 3D workspace using the virtual world server 209. In the 3D workspace, the 3D digital instance of

the physical object may appear. The user may select or otherwise interact with the 3D digital instance of the physical object to access information related to the physical object. Further to the non-limiting example where the channel 202 may represent the temperature in the specific building as measured by the thermostat sensor, the user may select or otherwise interact with a 3D digital instance of the thermostat. As a non-limiting example, the user may obtain a service history of the thermostat.

[0054] In the 3D workspace, the underlying functionalities of a channel 202 (identity, web services, enterprises services bus, databases) may be accessed in the same way as they would be using a channel 202 interface on the channel grid framework 201. By way of non-limiting example, when a user selects a specific channel 202, an instruction from the channel grid framework 201 may pass through the web services gateway 207 to interact with the identity management server 208. The user may be authenticated along with the registries to all services, applications, and information that may be involved with that performance of the function of channel 202. Once authenticated, the request for activity may be processed by one or more of the enterprise service bus 210, the channel alert server 211, the channel server 212, the video server 213, the enterprise content management server 214, the device integration server 215, the portal server 216, the Internet multimedia services gateway 218, the virtual world server 209, and the multiple databases 219. The information or service function to be performed or processed may then be processed back through the identity management server 208 for authorization, then transformed back into the channel characterization as defined in the channel grid framework 201 and displayed as the channel 202. Similarly, from the 3D workspace, the operations may occur.

[0055] The method may return to operation 408. If in operation 410 the user does not determine to interact with the 3D digital instance of the physical object, the method 400 may proceed to operation 412.

[0056] In operation 412, the user may determine whether to interact with a 3D avatar (an electronic representation of a human or other) of a second user in a 3D workspace to be displayed on both the user's platform or device and the second user's platform or device. If the user determines to interact with the 3D avatar of the second user in the 3D workspace, operation 422 may be performed. The user may be presented with the 3D workspace using the virtual world server 209. The second user may also be presented with the 3D workspace using the virtual world server 209. The first and second users may be on different platforms or devices. In the 3D workspace, the user may be represented by a 3D avatar of the user. The second user may be represented by the 3D avatar of the second user. The 3D avatars of the user and the second user may interact in the 3D workspace. The method may return to operation 408. If, in operation 412, the user does not determine to interact with the 3D avatar of the second user in the 3D workspace, the method may proceed to operation 414.

[0057] In operation 414, the user may determine whether to interact with a 3D digital instance of a physical object in a 3D workspace to implement a change in the 3D digital instance to implement a corresponding physical change in the physical object. If the user determines to interact with the 3D digital instance of the physical object in the 3D workspace, operation 424 may be performed. The user may be presented with the 3D workspace using the virtual world server 209. In the 3D workspace, a 3D digital instance of a physical object may appear. The user may implement a change in the 3D digital instance of the physical object to implement a

corresponding physical change in the physical object. Further to the non-limiting example where channel 202 may represent the temperature in the specific building as measured by a thermostat sensor, the user may increase the desired temperature in the 3D digital instance of the physical thermostat. Accordingly, the physical thermostat's setting may experience a corresponding increase in the desired temperature. The method may return to operation 408. If in operation 414 the user does not determine to interact with the 3D digital instance of the physical object in the 3D workspace, the method 400 may proceed to operation 416.

[0058] In operation 416, the user may determine whether to end the current session. If the user determines not to end the current session, the method 400 may return to operation 408. If the user does determine to end the current session, the method 400 may proceed to operation 426 and ends.

[0059] It should be noted that although FIG. 4 shows determinations occurring at particular points during the method, the determinations, like other operations, may be made at different points during the method, and differently relative to one another.

[0060] FIG. 5 is a flowchart of an exemplary method 500 of transferring a channel from a first platform or device to a second platform or device. In operation 502, the method 500 may begin.

[0061] In operation 503, a user may be authenticated. In operation 504, a channel grid framework 201 for the user may be established on a first platform or device. The channel grid framework 201 may provide access to a first computer application displayed on a display device as a channel 202. The channel 202 may be displayed on the first platform or device in a channel grid framework 201. As noted above, the channel server 212 may define the visual characterization, functions, information, and features of the channel 202. The channel

description and all related information may be stored in databases 219. All channels may be stored in a channel repository located within the channel server 212. When the channel 201 is added to the channel grid framework 201, software calls or hardware signals may be made to the channel server 212 to request a device specific download action to be performed. This action may route through the enterprise service bus 210 based on logic associated to the channel 202. Specific actions and information to be displayed may be served or serviced through the identity management service 208, and on the target device.

[0062] In operation 506, the channel 202 may be deployed from the channel grid framework 201 on the first platform or device to a second platform or device in response to the user selecting the channel from the channel grid framework 201 on the first platform or device and performing a copy operation of the channel 202 to the second platform or device. The selecting may include a dragging of the channel 202 out of the channel grid framework 201 and onto the application host and transfer tool 203 where the channel 202 may then be directed to a registered computing device. The channel grid framework 201 may be a browser-based software application or a stand-alone software application. The first platform or device may be running, and the channel grid framework 201 may be compatible with JavaFX™, Microsoft Silverlight™, Adobe Flex™, and similar proprietary and open source rich Internet application software frameworks, for example. The selection of the channel 202 may include using a rich Internet application or a similar class of software tools delivered via a browser or via a sandbox or virtual machine. For example, JavaFX™, Microsoft Silverlight™, Adobe Flex™, and similar proprietary and open source software tools may be used to provide additional functionality of the application host and transfer tool 203 to enable dragging of the channel 202 from the

channel grid framework 201 to an icon 204, 205, or 206 on the desktop 301 of the first platform or device. The icon 204, 205, or 206 may represent the second platform or device. While the rich Internet applications, such as JavaFX™, Microsoft Silverlight™, Adobe Flex™, and similar proprietary and open source software tools may be used to provide dragging functionality within the channel grid framework 201, the additional functionality of the application host and transfer tool 203 may provide the dragging functionality independent of the channel grid framework 202. Similarly to operation 504, when the channel 201 is added to the application host and transfer tool 203, software calls or hardware signals may be made to the channel server 212 to request a device specific download action to be performed.

[0063] In operation 508, a runtime application of the channel 201 may be established on the second platform or device. This may result in the channel 201 being displayed and becoming operational on the second platform or computing device. In operation 510, the method 500 ends.

[0064] The foregoing description discloses only exemplary embodiments of the invention. Modifications of the above-disclosed embodiments of the present invention of which fall within the scope of the invention will be readily apparent to those of ordinary skill in the art. By way of non-limiting example, although many items are shown as software applications (e.g., the channel grid framework 201), one or more of these items may also be embodied as hardware, or as a combination of software and hardware. Further, although one or more components are disclosed as existing in a SOA architecture, one or more components may exist as separate components, and may be merged or separated differently.

[0065] The devices and subsystems of the exemplary embodiments of FIGURES 1-5 are for exemplary purposes, as many variations of the specific hardware used to implement the exemplary embodiments are possible, as will be appreciated by those skilled in the relevant arts. By way of non-limiting example, the functionality of one or more of the devices and subsystems of the exemplary embodiments of FIGURES 1-5 can be implemented via one or more programmed computer systems or devices, including server computers, client computers, and the like.

[0066] To implement such variations as well as other variations, a single computer system can be programmed to perform the special purpose functions of one or more of the devices and subsystems of the exemplary embodiments of FIGURES 1-5. On the other hand, two or more programmed computer systems or devices can be substituted for any one of the devices and subsystems of the exemplary embodiments of FIGURES 1-5. Accordingly, principles and advantages of distributed processing, such as redundancy, replication, and the like, also can be implemented, as desired, to increase the robustness and performance of the devices and subsystems of the exemplary embodiments of FIGURES 1-5.

[0067] The devices and subsystems of the exemplary embodiments of FIGURES 1-5 can store information relating to various processes described herein. This information can be stored in one or more memories, such as a hard disk, optical disk, magneto-optical disk, RAM, and the like, of the devices and subsystems of the exemplary embodiments of FIGURES 1-5. One or more databases of the devices and subsystems of the exemplary embodiments of FIGURES 1-5 can store the information used to implement the exemplary embodiments of the present invention. The databases can be organized using data structures (e.g., records, tables, arrays,

fields, graphs, trees, lists, and the like) included in one or more memories or storage devices listed herein. The processes described with respect to the exemplary embodiments of FIGURES 1-5 can include appropriate data structures for storing data collected and/or generated by the processes of the devices and subsystems of the exemplary embodiments of FIGURES 1-5 in one or more databases thereof.

[0068] All or a portion of the devices and subsystems of the exemplary embodiments of FIGURES 1-5 can be conveniently implemented using one or more general purpose computer systems, microprocessors, digital signal processors, micro-controllers, and the like, programmed according to the teachings of the exemplary embodiments of the present invention, as will be appreciated by those skilled in the computer and software arts. Appropriate software can be readily prepared by programmers of ordinary skill based on the teachings of the exemplary embodiments, as will be appreciated by those skilled in the software art. Further, the devices and subsystems of the exemplary embodiments of FIGURES 1-5 can be implemented on the World Wide Web. In addition, the devices and subsystems of the exemplary embodiments of FIGURES 1-5 can be implemented by the preparation of application-specific integrated circuits or by interconnecting an appropriate network of conventional component circuits, as will be appreciated by those skilled in the electrical arts. Thus, the exemplary embodiments are not limited to any specific combination of hardware circuitry and/or software.

[0069] As stated above, the devices and subsystems of the exemplary embodiments of FIGURES 1-5 can include computer readable storage media or memories for holding instructions programmed according to the teachings of the present invention and for holding

data structures, tables, records, and/or other data described herein. Computer readable storage media can include any suitable medium that participates in providing instructions to a processor for execution. Such a medium can take many forms, including but not limited to, non-volatile media, volatile media, transmission media, and the like. Non-volatile media can include, by way of non-limiting example, optical or magnetic disks, magneto-optical disks, and the like. Volatile media can include dynamic memories, and the like. Transmission media can include coaxial cables, copper wire, fiber optics, and the like. Transmission media also can take the form of acoustic, optical, electromagnetic waves, and the like, such as those generated during radio frequency (RF) communications, infrared (IR) data communications, and the like. Common forms of computer-readable storage media can include, by way of non-limiting example, a floppy disk, a flexible disk, hard disk, magnetic tape, any other suitable magnetic medium, a CD-ROM, CDRW, DVD, any other suitable optical medium, punch cards, paper tape, optical mark sheets, any other suitable physical medium with patterns of holes or other optically recognizable indicia, a RAM, a PROM, an EPROM, a FLASH-EPROM, any other suitable memory chip or cartridge, a carrier wave, or any other suitable medium from which a computer can read.

[0070] Although embodiments of the present invention have been shown and described, the present invention is not so limited, but rather covers various modifications and equivalent arrangements, which fall within the purview of the claims and their equivalents.

What is claimed is:

1. A computer-readable storage media for interacting with multiple information forms across computing devices, the computer-readable storage media including computer-readable instructions configured to cause one or more computer processors to execute the operations comprising:

authenticating a user;

establishing a channel grid framework for the user on a first platform, the channel grid framework providing access to a first computer application displayed on a display device as a channel;

deploying the channel from the channel grid framework on the first platform to a second platform in response to a user selecting the channel from the channel grid framework on the first platform and performing a copy operation of the channel to the second platform; and

establishing a run time application of the first computer application on the second platform.

2. The computer-readable storage media of claim 1, wherein the user selecting the channel from the channel grid framework on the first platform and performing the copy operation of the channel to the second platform includes performing a drag and drop operation.

3. The computer-readable storage media of claim 1, wherein the channel is a computer application capable of at least one of launching other computer applications, receiving data

regarding other computer applications, displaying streaming data, or polling external computer applications.

4. The computer-readable storage media of claim 1, wherein the channel grid framework provides access to twelve channels conveying information.

5. The computer-readable storage media of claim 1, wherein the first and second platforms comprise different members from a group consisting of a server, a network of servers, a desktop computer, a laptop computer, a tablet computer, a netbook computing device, a personal digital assistant (PDA), a telephone, a cell phone device, a handheld device, a smart phone, an interactive display, a portable digital assistant (PDA), an enterprise digital assistant, a personal navigation device, a network connected device, an optical disk player, an in-vehicle device, a set-top television box, a virtual machine, and a game console.

6. The computer-readable storage media of claim 1, wherein deploying the channel from the channel grid framework includes:

displaying an icon on the first platform, the icon instantiating a representation of the second platform; and

identifying the selected channel from the channel grid framework on the first platform and displaying a representation of the selected channel; and

dragging the representation of the selected channel out of the channel grid framework on the first platform and displaying a representation of the selected channel with the icon of the second platform.

7. The computer-readable storage media of claim 1, wherein the first computer application displayed on the display device as a channel includes at least one of a streaming video application, an audio application, a voice-over-IP application, an environmental monitoring application, a financial services application, an enterprise resource planning application, a building information modeling application, a product lifecycle management application, a project management application, an immersive three dimensional environment application, a video conferencing application, an RSS reader application, a channel application repository application, an end-user preferences and localization application, a word processing application, a spreadsheet application, a presentation-slide show application, an email application, an address book application, an instant messaging application, an enterprise content management application, a text application, a graphics application, a picture application, a video application, a remote control-interaction application, and a three-dimensional graphic visualization of objects application.

8. The computer-readable storage media of claim 1 further comprising computer-readable instructions configured to cause one or more computer processors to execute the operations comprising:

interrogating the channel in the channel grid framework on the display device to evaluate content provided by the first computer application.

9. The computer-readable storage media of claim 8 further comprising computer-readable instructions configured to cause one or more computer processors to execute the operations comprising:

configuring the channel grid framework to provide an intelligent alert object;

comparing the evaluated content provided by the first computer application to a predetermined intelligent alert threshold condition; and

displaying an alert condition on the first and second platforms when the evaluated content meets the predetermined threshold condition.

10. The computer-readable storage media of claim 8 further comprising computer-readable instructions configured to cause one or more computer processors to execute the operations comprising:

selecting an object from the first computer application displayed on the display device as a three-dimensional workspace; and

interacting spatially with a digital instance of the selected object in the three-dimensional workspace to access a second computer application providing additional content related to the selected object displayed in the three-dimensional workspace.

11. The computer-readable storage media of claim 8 further comprising computer-readable instructions configured to cause one or more computer processors to execute the operations comprising:

selecting an object displayed by the first computer application in a three-dimensional workspace, the selected object in the three-dimensional workspace corresponding to a physical device in a physical space;

interacting spatially with a digital instance of the selected object in the three-dimensional workspace to access a second computer application providing additional content related to the selected object displayed in the three-dimensional workspace; and

implementing a virtual change in the digital instance of the selected object using the second computer application to implement a corresponding physical change in the physical device.

12. The computer-readable storage media of claim 11, wherein interacting spatially with a digital instance of the selected object in the three-dimensional workspace to access a second computer application providing additional content related to the selected object displayed in the three-dimensional workspace includes interacting with a 3D avatar of a second user in a 3D workspace to be displayed on both the user's platform and the second user's platform.

13. A computer-implemented method for interacting with multiple information forms across computing devices, the computer- implemented method comprising:

authenticating a user;

establishing a channel grid framework for the user on a first computing device platform, the channel grid framework providing access to a first computer application displayed on a display device as a channel;

deploying the channel from the channel grid framework on the first computing device platform to a second computing device platform in response to a user selecting the channel from the channel grid framework on the first computing device platform and performing a copy operation of the channel to the second computing device platform; and

establishing a run time application of the first computer application on the second computing device platform.

14. The computer-implemented method of claim 13, wherein the user selecting the channel from the channel grid framework on the first computing device platform and performing the copy operation of the channel to the second computing device platform includes performing a drag and drop operation.

15. The computer-implemented method of claim 13, wherein the channel is a computer application capable of at least one of launching other computer applications, receiving data regarding other computer applications, displaying streaming data, or polling external computer applications.

16. The computer-implemented method of claim 13, wherein the channel grid framework provides access to twelve channels conveying information.

17. The computer-implemented method of claim 13, wherein the first and second computer device platforms comprise different members from a group consisting of a server, a network of servers, a desktop computer, a laptop computer, a tablet computer, a netbook computing device, a personal digital assistant (PDA), a telephone, a cell phone device, a handheld device, a smart phone, an interactive display, a portable digital assistant (PDA), an enterprise digital assistant, a personal navigation device, a network connected device, an optical disk player, an in-vehicle device, a set-top television box, a virtual machine, and a game console.

18. The computer-implemented method of claim 13, wherein deploying the channel from the channel grid framework includes:

displaying an icon on the first computing device platform, the icon instantiating a representation of the second computing device platform; and

identifying the selected channel from the channel grid framework on the first computing device platform and displaying a representation of the selected channel; and

dragging the representation of the selected channel out of the channel grid framework on the first computing device platform and displaying a representation of the selected channel with the icon of the second computing device platform.

19. The computer-implemented method of claim 13, wherein the first computer application displayed on the display device as a channel includes at least one of a streaming video application, an audio application, a voice-over-IP application, an environmental monitoring

application, a financial services application, an enterprise resource planning application, a building information modeling application, a product lifecycle management application, a project management application, an immersive three dimensional environment application, a video conferencing application, an RSS reader application, a channel application repository application, an end-user preferences and localization application, a word processing application, a spreadsheet application, a presentation-slide show application, an email application, an address book application, an instant messaging application, an enterprise content management application, a text application, a graphics application, a picture application, a video application, a remote control-interaction application, and a three-dimensional graphic visualization of objects application.

20. The computer-implemented method of claim 13 further comprising:

interrogating the channel in the channel grid framework on the display device to evaluate content provided by the first computer application.

21. The computer-implemented method of claim 20 further comprising:

configuring the channel grid framework to provide an intelligent alert object;

comparing the evaluated content provided by the first computer application to a predetermined intelligent alert threshold condition; and

displaying an alert condition on the first and second computing device platforms when the evaluated content meets the predetermined threshold condition.

22. The computer-implemented method of claim 20 further comprising:

selecting an object from the first computer application displayed on the display device as a three-dimensional workspace; and

interacting spatially with a digital instance of the selected object in the three-dimensional workspace to access a second computer application providing additional content related to the selected object displayed in the three-dimensional workspace.

23. The computer-implemented method of claim 20 further comprising:

selecting an object displayed by the first computer application in a three-dimensional workspace, the selected object in the three-dimensional workspace corresponding to a physical device in a physical space;

interacting spatially with a digital instance of the selected object in the three-dimensional workspace to access a second computer application providing additional content related to the selected object displayed in the three-dimensional workspace; and

implementing a virtual change in the digital instance of the selected object using the second computer application to implement a corresponding physical change in the physical device.

24. The computer-implemented method of claim 23, wherein interacting spatially with a digital instance of the selected object in the three-dimensional workspace to access a second computer application providing additional content related to the selected object displayed in the three-dimensional workspace includes interacting with a 3D avatar of a second user in a 3D workspace to be displayed on the user's computing device platform and on the second user's computing device platform.

25. A system for interacting with multiple information forms across computing devices, the system comprising:

an identity management server configured to authenticate a user;

a channel grid framework established for the user on a first computing device platform, the channel grid framework providing access to a first computer application displayed on a display device as a channel; and

an application host and transfer tool configured to deploy the channel from the channel grid framework on the first computing device platform to a second computing device platform in response to a user selecting the channel from the channel grid framework on the first computing device platform and performing a copy operation of the channel to the second computing device platform and further configured to establish a run time application of the first computer application on the second computing device platform.

26. The system of claim 25, wherein the application host and transfer tool is further configured to receive a copy of the channel in response to the copy operation, including the user

selecting the channel from the channel grid framework on the first computing device platform and performing a drag and drop copy operation of the channel to the second computing device.

27. The system of claim 25 further comprising:

a Web services gateway configured to integrate subordinate application functions in the channel, the subordinate applications functions including at least one of launching other computer applications, receiving data regarding other computer applications, displaying streaming data, or polling external computer applications.

28. The system of claim 25, wherein the channel grid framework provides access to twelve channels conveying information.

29. The system of claim 25, wherein the first and second computer device platforms comprise different members from a group consisting of a server, a network of servers, a desktop computer, a laptop computer, a tablet computer, a netbook computing device, a personal digital assistant (PDA), a telephone, a cell phone device, a handheld device, a smart phone, an interactive display, a portable digital assistant (PDA), an enterprise digital assistant, a personal navigation device, a network connected device, an optical disk player, an in-vehicle device, a set-top television box, a virtual machine, and a game console.

30. The system of claim 25, wherein the application host and transfer tool is further configured to:

display an icon on the first computing device platform, the icon instantiating a representation of the second computing device platform;

identify the selected channel from the channel grid framework on the first computing device platform and display a representation of the selected channel; and

display a representation of the selected channel with the icon of the second computing device platform in response to a user dragging the representation of the selected channel out of the channel grid framework on the first computing device platform.

31. The system of claim 25, wherein the first computer application displayed on the display device as a channel includes at least one of a streaming video application, an audio application, a voice-over-IP application, an environmental monitoring application, a financial services application, an enterprise resource planning application, a building information modeling application, a product lifecycle management application, a project management application, an immersive three dimensional environment application, a video conferencing application, an RSS reader application, a channel application repository application, an end-user preferences and localization application, a word processing application, a spreadsheet application, a presentation-slide show application, an email application, an address book application, an instant messaging application, an enterprise content management application, a text application, a graphics application, a picture application, a video application, a remote control-interaction application, and a three-dimensional graphic visualization of objects application.

32. The system of claim 27, wherein the identity management server and the web services gateway are further configured to interrogate the channel in the channel grid framework on the display device to evaluate content provided by the first computer application.

33. The system of claim 32 further comprising:

a channel server configured to provide the first computer application displayed on the display device as the channel;

a channel alert server configured to provide an intelligent alert object to the channel grid framework and further configured to compare the evaluated content provided by the first computer application to a predetermined intelligent alert threshold condition and display an alert condition on the first and second computing device platforms when the evaluated content meets the predetermined threshold condition.

34. The system of claim 32 further comprising:

a virtual world server configured to select an object from the first computer application displayed on the display device as a three-dimensional workspace and interact spatially with a digital instance of the selected object in the three-dimensional workspace to access a second computer application providing additional content related to the selected object displayed in the three-dimensional workspace.

35. The system of claim 32, wherein the virtual world server is further configured to:

select an object displayed by the first computer application in a three-dimensional workspace, the selected object in the three-dimensional workspace corresponding to a physical device in a physical space;

interact spatially with a digital instance of the selected object in the three-dimensional workspace to access a second computer application providing additional content related to the selected object displayed in the three-dimensional workspace; and

implement a virtual change in the digital instance of the selected object using the second computer application to implement a corresponding physical change in the physical device.

36. The system of claim 35, wherein interacting spatially with a digital instance of the selected object in the three-dimensional workspace to access a second computer application providing additional content related to the selected object displayed in the three-dimensional workspace includes interacting with a 3D avatar of a second user in a 3D workspace to be displayed on the user's computing device platform and on the second user's computing device platform.

ABSTRACT OF THE DISCLOSURE

A system and method for interacting with multiple information forms across multiple types of computing devices and platforms is provided. A computer-readable storage media for interacting with multiple information forms across computing devices is also provided and includes computer-readable instructions to cause one or more computer processors to execute operations including authenticating a user; establishing a channel grid framework for the user on a first platform, the channel grid framework providing access to a first computer application displayed on a display device as a channel; deploying the channel from the channel grid framework on the first platform to a second platform in response to a user selecting the channel from the channel grid framework on the first platform and performing a copy operation of the channel to the second platform; and establishing a run time application of the first computer application on the second platform.

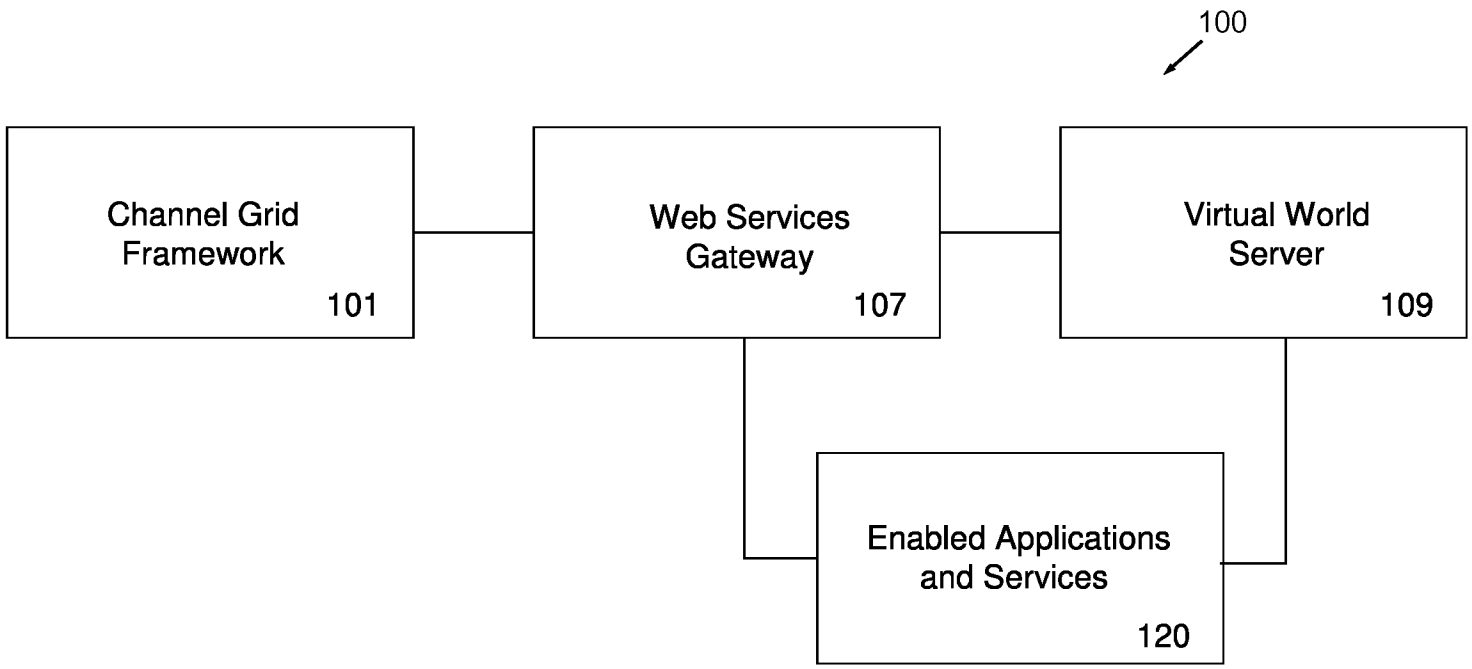
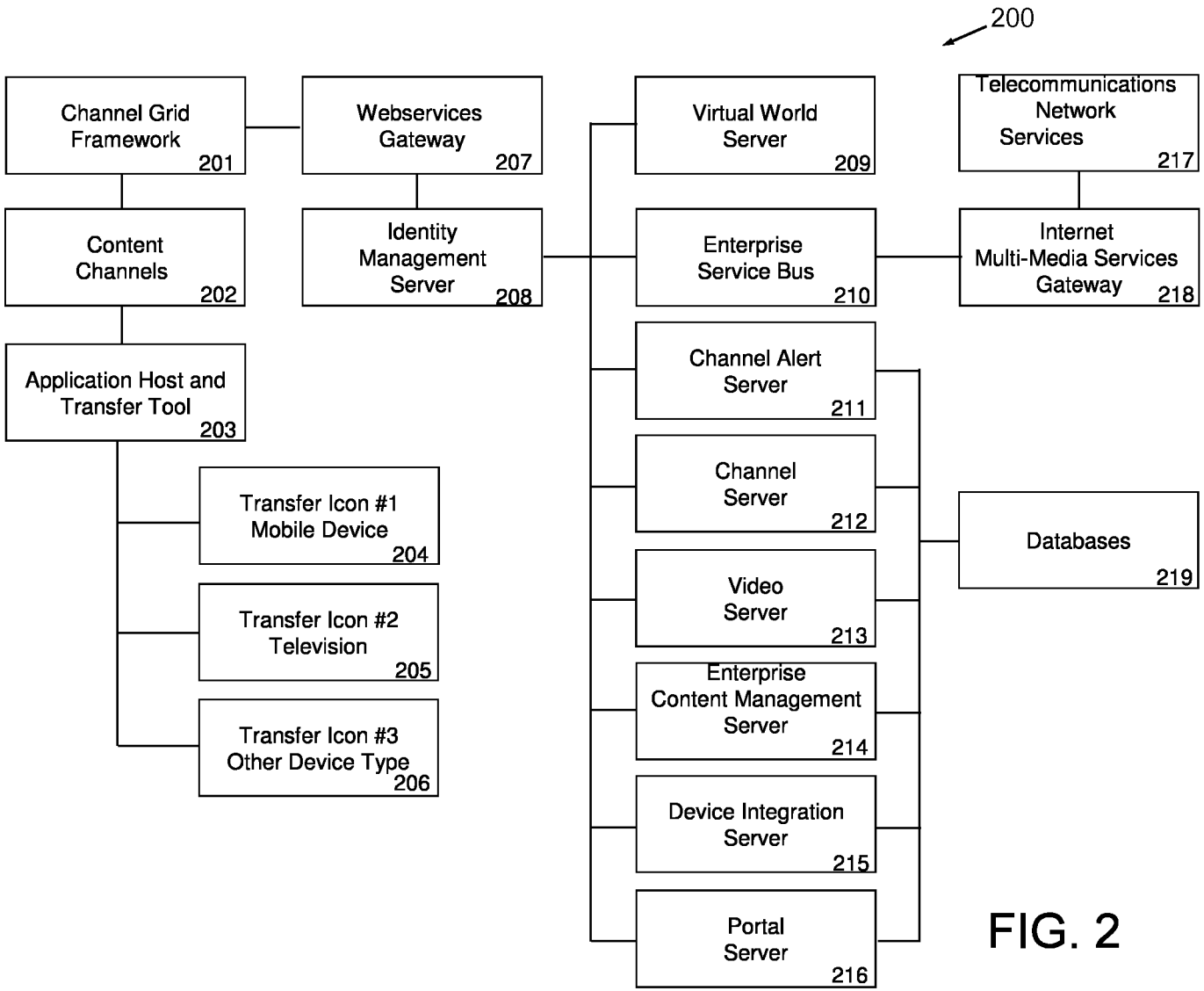

100
Channel Grid Framework
101
Web Services Gateway
107
Virtual World Server
109
Enabled Applications and Services
120

FIG. 1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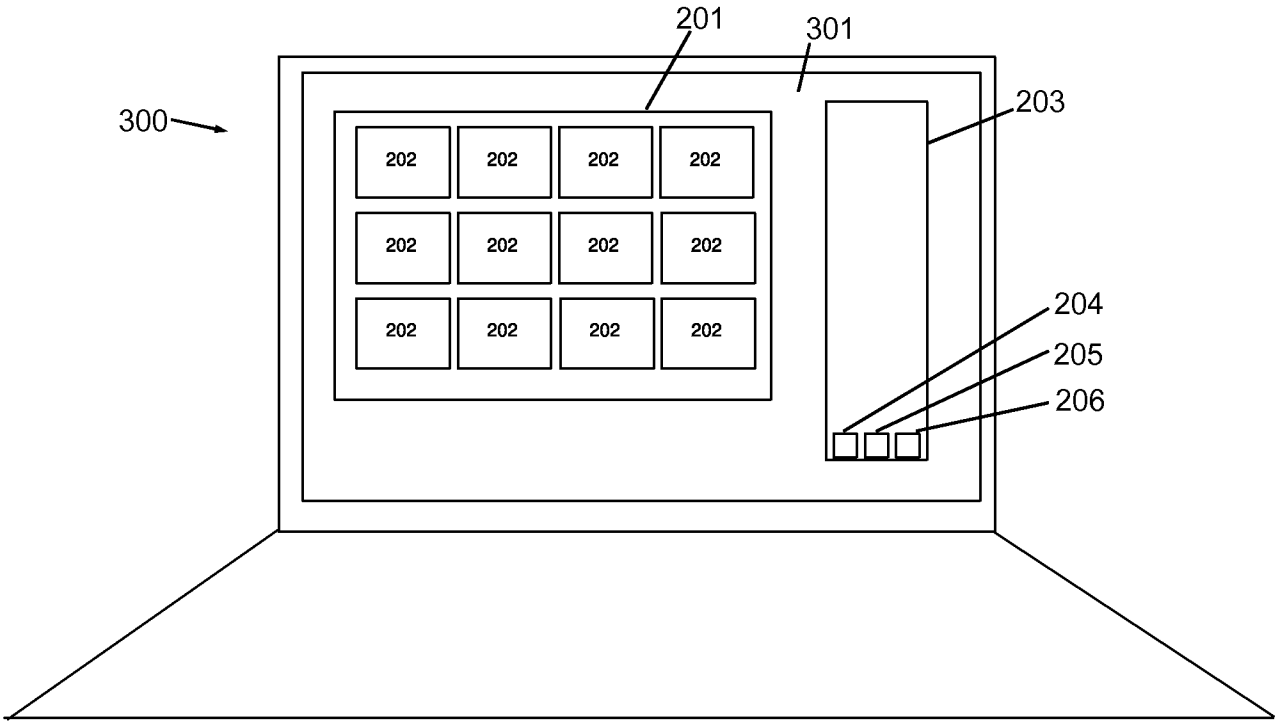
Channel Grid Framework 201
Webservices Gateway 207
Virtual World Server 209
Telecommunications Network Services 217
Content Channels 202
Identity Management Server 208
Enterprise Service Bus 210
Internet Multi-Media Services Gateway 218
Application Host and Transfer Tool 203
Channel Alert Server 211
Channel Server 212
Transfer Icon #1 Mobile Device 204
Transfer Icon #2 Television 205
Transfer Icon #3 Other Device Type 206
Video Server 213
Databases 219
Enterprise Content Management Server 214
Device Integration Server 215
Portal Server 216

FIG. 2


201
301
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202
202
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202
202
202
202
202
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202
204
205
206

FIG. 3

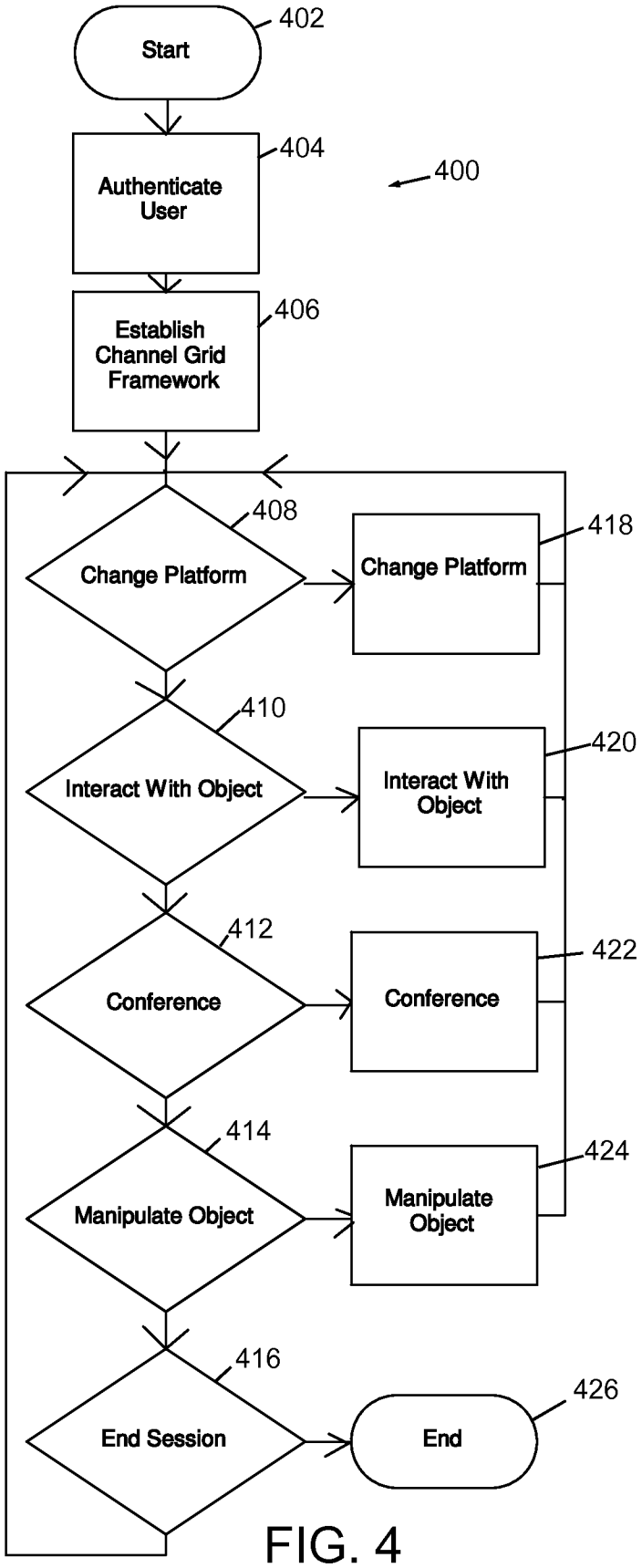
Start
402
Authenticate User
404
400
Establish Channel Grid Framework
406
Change Platform
408
Change Platform
418
Interact With Object
410
Interact With Object
420
Conference
412
Conference
422
Manipulate Object
414
Manipulate Object
424
End Session
416
End
426

FIG. 4

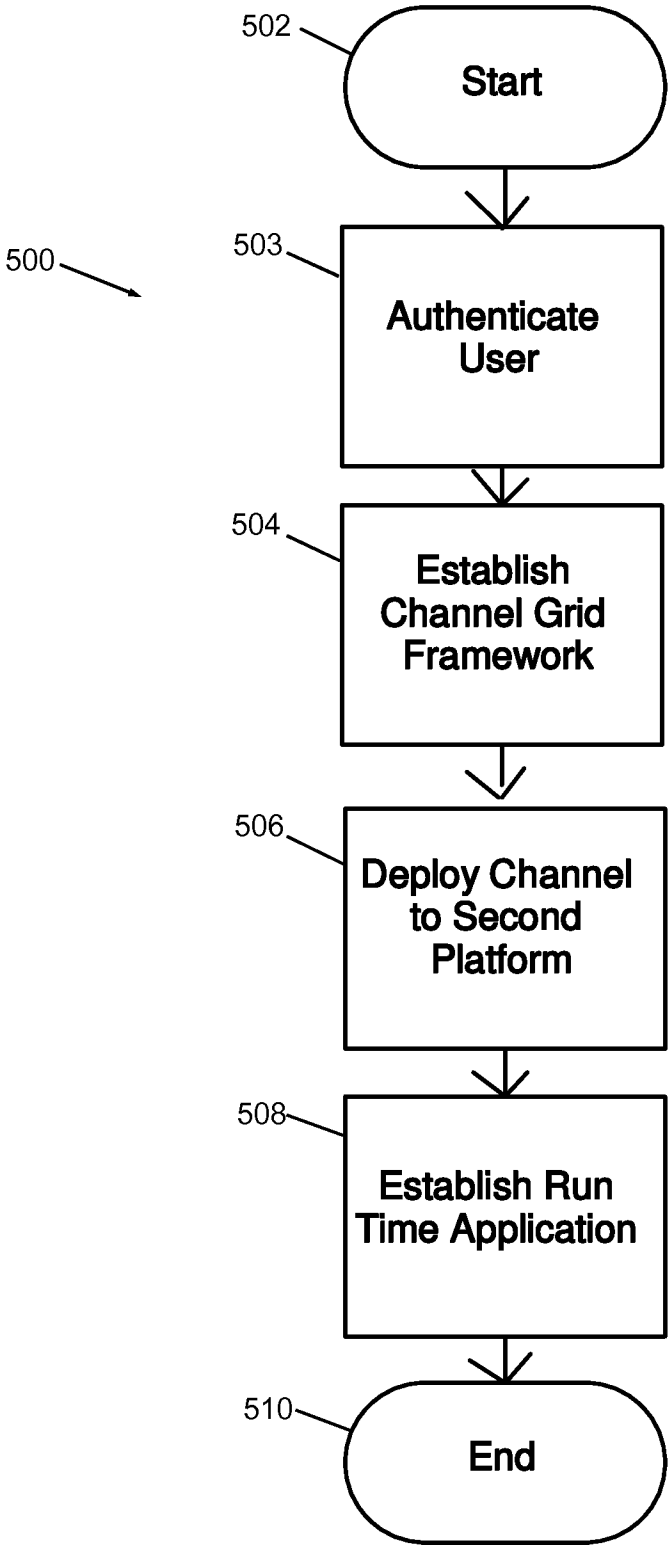
502
Start
500
503
Authenticate User
504
Establish Channel Grid Framework
506
Deploy Channel to Second Platform
508
Establish Run Time Application
510
End

FIG. 5

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	046573-000005
	Application Number	
Title of Invention	APPARATUS AND METHODS FOR INTERACTING WITH MULTIPLE INFORMATION FORMS ACROSS MULTIPLE TYPES OF COMPUTING DEVICES	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Applicant Information:

Applicant 1 Remove

Applicant Authority ◉ Inventor ◯ Legal Representative under 35 U.S.C. 117 ◯ Party of Interest under 35 U.S.C. 118

Prefix	Given Name	Middle Name	Family Name	Suffix
	Michael		WETZER	

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	Thomas		THERIAULT	

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Address 2			
City	Baldwinsville	State/Province	NY
Postal Code	13027	Country i	US

Applicant 3 Remove

Applicant Authority ◉ Inventor ◯ Legal Representative under 35 U.S.C. 117 ◯ Party of Interest under 35 U.S.C. 118

Prefix	Given Name	Middle Name	Family Name	Suffix
	Mark		DINGMAN	

Residence Information (Select One) ◉ US Residency ◯ Non US Residency ◯ Active US Military Service

City	Tully	State/Province	NY	Country of Residence i	US

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	046573-000005
	Application Number	
Title of Invention	APPARATUS AND METHODS FOR INTERACTING WITH MULTIPLE INFORMATION FORMS ACROSS MULTIPLE TYPES OF COMPUTING DEVICES	

Citizenship under 37 CFR 1.41(b) i	US		
Mailing Address of Applicant:			
Address 1	1378 State Route 80		
Address 2			
City	Tully	**State/Province**	NY
Postal Code	13159	**Country**i	US

Applicant 4 Remove

Applicant Authority (•) Inventor ( ) Legal Representative under 35 U.S.C. 117 ( ) Party of Interest under 35 U.S.C. 118

Prefix	**Given Name**	**Middle Name**	**Family Name**	**Suffix**
	Rupert		KEY	

Residence Information (Select One) ( ) US Residency (•) Non US Residency ( ) Active US Military Service

City	Woodley Reading, Berkshire	**Country Of Residence**i	UK
Citizenship under 37 CFR 1.41(b) i	UK		
Mailing Address of Applicant:			
Address 1	7 Scott Close		
Address 2			
City	Woodley Reading, Berkshire	**State/Province**	
Postal Code	RG5 4UP	**Country**i	UK

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For further information see 37 CFR 1.33(a).

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Customer Number	22204	
Email Address		Add Email Remove Email

Application Information:

Title of the Invention	APPARATUS AND METHODS FOR INTERACTING WITH MULTIPLE INFORMATION FORMS ACROSS MULTIPLE TYPES OF COMPUTING DEVICES		
Attorney Docket Number	046573-000005	**Small Entity Status Claimed**	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		**Sub Class (if any)**	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)		**Suggested Figure for Publication (if any)**	

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	046573-000005
	Application Number	
Title of Invention	APPARATUS AND METHODS FOR INTERACTING WITH MULTIPLE INFORMATION FORMS ACROSS MULTIPLE TYPES OF COMPUTING DEVICES	

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S. C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Enter either Customer Number or complete the Representative Name section below. If both sections are completed the Customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	22204		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	non provisional of	61052765	2008-05-13

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

Remove

Application Number	Country i	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
			○ Yes ◉ No

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Assignee Information:

Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office.

Assignee 1 Remove

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	046573-000005
	Application Number	
Title of Invention	APPARATUS AND METHODS FOR INTERACTING WITH MULTIPLE INFORMATION FORMS ACROSS MULTIPLE TYPES OF COMPUTING DEVICES	

If the Assignee is an Organization check here. ☐				
Prefix	**Given Name**	Middle Name	**Family Name**	Suffix
Mailing Address Information:				
Address 1				
Address 2				
City		**State/Province**		
Country [i]		Postal Code		
Phone Number		Fax Number		
Email Address				
Additional Assignee Data may be generated within this form by selecting the **Add** button.				Add

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.					
Signature	/Joseph A. Parisi, Reg. No. 53,435/			Date (YYYY-MM-DD)	2009-05-13
First Name	Joseph A.	Last Name	Parisi	Registration Number	53435

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	5329120
Application Number:	12465331
International Application Number:	
Confirmation Number:	3370
Title of Invention:	APPARATUS AND METHODS FOR INTERACTING WITH MULTIPLE INFORMATION FORMS ACROSS MULTIPLE TYPES OF COMPUTING DEVICES
First Named Inventor/Applicant Name:	Michael WETZER
Customer Number:	22204
Filer:	Joseph A. Parisi/Rhonda M. Grant
Filer Authorized By:	Joseph A. Parisi
Attorney Docket Number:	046573-000005
Receipt Date:	13-MAY-2009
Filing Date:	
Time Stamp:	16:29:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		046573_000005_Specification.pdf	190493 a78ca32a5bef9147905340be17535dd024af2e60	yes	43

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Specification	1	28
	Claims	29	42
	Abstract	43	43

Warnings:					
Information:					
2	Drawings-only black and white line drawings	046573_000005_Drawings.pdf	124876 2c456d75513e547bd8b0b6a02a8d67277f2fe9f7	no	5
Warnings:					
Information:					
3	Application Data Sheet	046573_000005_ApplicationDataSheet.pdf	1274824 6ad1bd5180568a582f7c0d6526fdea3ad0b5fd86	no	5
Warnings:					
Information:					
		Total Files Size (in bytes):	1590193		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Filing Date: 05/13/09

Approved for use through 7/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 12/465,331

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	82		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	270		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	110		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	36 minus 20 =	16	x$26	416	OR	x$52	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x$110			x$220	
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $260 ($130 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR						
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))			195			390	
			TOTAL	878		TOTAL	

* If the difference in column 1 is less than zero, enter "0" in column 2.

APPLICATION AS AMENDED – PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDI-TIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDI-TIONAL FEE ($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					N/A		OR	N/A	
						TOTAL ADD'T FEE		OR	TOTAL ADD'T FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDI-TIONAL FEE ($)	OR	RATE ($)	ADDI-TIONAL FEE ($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					N/A		OR	N/A	
						TOTAL ADD'T FEE		OR	TOTAL ADD'T FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Paten and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.