

will be delivered from the active client agent **510** to the client **470** via filters **520** and **530**. The role and right filter **520** verifies the access rights of the team member for the information to be delivered. The present invention permits asymmetric assignment of roles (permitted actions) among team members. The role and right filter **520** examines each action and the data being exchanged to or from the action agent in terms of roles and capabilities. For instance, a team member with a low privilege level can read a document but cannot make contributions or changes. In this case, the role and right filter **520** will prevent any attempted changes by the low privilege team member from being recorded in the addendum database **420**.

[0040] The presentation filter **530** transforms the information into an appropriate presentation, based on, for example, the role and access rights of the requester, as well as the properties of the computing and network environments. For example, based on the restrictions of the devices, communication channels and user's settings, the presentation filter **530** transforms the XML code to optimize transmission speed. The presentation filter **530** can also monitor cached image files in client machines **470** to minimize image transmission.

[0041] As shown in **FIG. 5**, an active client agent **510** associated with a particular team member, such as the active client agent **510-3** associated with the team member employing client terminal **470-3**, will obtain a requested document from the document database **175** (as updated by any modifications in the addendum database **420**) for presentation to the requesting team member, and will record any further authorized modifications to the document in the addendum database **420**. The requested document **505** will be accessed by the active client agent **510-3** along a path **515**, together with any associated updates to the requested document **505** from the addendum database **420** along a path **525**, and passed to the requesting team member along a path **540** through the role and right filter **520** (provided that the requesting team member has the appropriate access privileges). Similarly, any authorized changes to the requested document (e.g., additions or change requests, or both) that are made by the requesting team member are received by the active client agent **510** along a path **560** through the role and right filter **520** (provided that the requesting team member has the appropriate modification privileges), for recording in the addendum database **420** along a path **565**.

[0042] **FIG. 6** illustrates a configuration of the project management system **400** of **FIG. 4** in a synchronous collaboration mode. The synchronous collaboration component **600** allows two or more team members to participate in a collaborative session. As previously indicated, the synchronous collaboration component **600** expands the functions of the asynchronous collaboration component **500** of **FIG. 5** with the addition of a sound board **900**. Generally, the sound board **900** makes actions by one team member visible to another team member, whether in real-time or in a playback mode. In this manner, the synchronous collaboration component **600** supports virtual meetings among team members.

[0043] As shown in **FIG. 6**, the sound board **900** is a software entity comprised of the active client agents **510** associated with each team member. It is noted that in a synchronous collaboration mode one or more team members may be active at a time. The sound board **900** intercepts an

incremental change (addition or modification) to the base document along a path **670** from the role and right filter **520** to the active client agent **510** of one team member and broadcasts such intercepted traffic to all other active client agents **510** of other active team members (and also records such intercepted traffic in the addendum database **420**). Thus, all the team members in a synchronous session will share changes to the documents by sharing addendum additions in real time. The manner in which the sound board **900** serializes the various modification requests made by each team member and ensures that each team member is presented with a consistent view of the shared document is discussed further below in conjunction with **FIG. 9**.

[0044] **FIG. 7** is a flow chart showing transitions between an asynchronous collaboration mode **500** and a synchronous collaboration mode **600** (or vice versa) in accordance with the present invention. The transition process **700** is initiated during step **705** and remains in step **705** until a new session is started by a team member. From step **705**, a team member can either start a new project or continue an existing project.

[0045] From step **705**, a team member can start a new project in an asynchronous session as a manager of the project by following the execution path of steps **705**, **707**, **710** and **730**. Likewise, a team member can continue an existing project in an asynchronous session by following the execution path of steps **505**, **515**, **525** and **530**.

[0046] From step **705**, a team member can start a new project in a synchronous collaboration session with somebody by following the execution path of steps **705**, **707**, **711**, **735**, **750**, **760** and **765**. Likewise, a team member can continue an existing project in a synchronous mode by following the execution path of steps **705**, **715**, **725**, **735**, **750**, **760** and **765**.

[0047] A team member can initiate a transition between asynchronous and synchronous modes by inviting another team member to an active session by following the execution path of steps **740**, **750**, **760** and **765**. Similarly, the invitee either follows the execution path of steps **705**, **720**, **735**, **750**, **760** and **765**; or the execution path **740**, **750**, **760** and **765**.

[0048] In one preferred embodiment, when a team member goes into a synchronous session, the team member will always go through an asynchronous session at step **740** or an asynchronous session sign-in process at step **735**. This allows the team member to obtain all the up-to-date document information from the addendum database **420**. Once the document has been properly updated in accordance with the modifications from the addendum database **420**, the status moves into a synchronous session at step **765**.

[0049] From a synchronous collaboration session at step **765**, a team member transition to an asynchronous collaboration session via the execution path **765**, **775** and **740** or can go back to a no session status via the execution path **765**, **770**, **745** and **705**. Thus, according to one aspect of the present invention, the components for synchronous collaboration are blended with components for asynchronous collaboration.

[0050] **FIG. 8** is a flow chart illustrating an exemplary implementation of a task completion process **800** incorporating features of the present invention. As shown in **FIG. 8**, the task completion process **800** is initiated during step **805**