The MARIFlow Workflow Management System *

A. Dogac, M. Ezbiderli, Y. Tambag, C. Icdem, A. Tumer, N. Tatbul, N. Hamali
Software R&D Center, METU, Ankara, Turkiye, asuman@srdc.metu.edu.tr
C. Beeri
Hebrew University, Jerusalem, Israel

MARIFlow System [1] provides for automating and monitoring the flow of control and data over the Internet among different organizations, thereby creating a platform necessary to describe higher order processes involving several organizations and companies.

The architecture is general enough to be applied to any business practice where data flow among different industries and cooperations and the invocation of activities follow a pattern that can be described through a process definition. The example application provided within the scope of this project is on maritime industry

A MARIFlow process is executed through cooperating agents, called MARCAs (MARIFlow Cooperating Agents) that are automatically initialized at each site that the process executes. MARCAs handle the activities at their site, provide for coordination with other MARCAs in the system by routing the documents in electronic form according to the process description, keeping track of process information, and providing for the security and authentication of documents as well as comprehensive monitoring facilities.

More specifically, the functionality provided by the system is as follows:

- A declarative means to specify the control of document flow over the Internet where it is possible to define the source of data, its control flow and the activities that make use of this data.

- A fully distributed execution architecture achieved through cooperating agents over the Internet. The agents know about other agents that they need to communicate with and preserve their state during communication. They also manage local information for monitoring purposes and for recovering from failures.

- Communicating with inside firewall applications. A MARCA can activate in-house activities automatically. However it should be noted that most organizations may be reluctant to grant access inside the corporate firewall. In such cases, the MARCA passes the documents to an in-house system by properly acknowledging the in-house system on further processing that may be necessary on the documents. A MARCA is also responsible for getting the documents from the in-house system and forwarding them to the related agents as specified in the process definition.

- There is a coordinating MARCA in the system through which it is possible to define processes graphically from a Web interface. The coordinating MARCA is also responsible for initializing the MARCAs at each site for a new process definition and acting as a facilitator among MARCAs in the sense that for a new workflow definition it decides which new MARCAs are necessary. Note that only one MARCA exists at each site and handles all the activities of all workflow definitions related with that site. Therefore a new MARCA is generated only for a site participating to a workflow definition for the first time. Coordinating MARCA also acts as a data warehouse for monitoring purposes.

- Authentication and authorization of documents and the process related information.

- A monitoring mechanism for keeping track of the documents and for providing detailed account of the current status of a process instance within the system.

- Ability to recover the system from various type of failures.

References

[1] A. Dogac, M. Ezbiderli, N. Tatbul, C. Icdem, G. Erus, O. Cetinkaya, A. Tumer, C. Beeri, "A Workflow System through Cooperating Agents for Document Flow over the Internet", Submitted for publication