A Framework for the Development of Organizational Collaborative Systems

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ABSTRACT
It seems that the future of collaborative systems implies the incorporation of End-User Development processes and new mechanisms for adaptability, so that each user could be able to fit this specific type of software to their particular needs in a given time. In the case of organizational systems, adaptability characteristics should also cover concrete aspects associated to the nature of organizations. Therefore, this article presents a framework that simplifies the creation of adaptive organizational collaborative systems by means of models and components.

Categories and Subject Descriptors
H.5.3 [Information Systems]: Group and Organization Interfaces - Collaborative computing, Synchronous interaction, Theory and models.

General Terms
Design, Human Factors, Theory.

Keywords

1. INTRODUCTION
This paper presents a framework that simplifies the development and maintenance of collaborative systems in increasingly dynamic environments, facilitates the incorporation of end-users to development processes, and allows every user to tailor collaborative software to their needs or preferences.

2. FRAMEWORK
The following sections present the three elements that compound the basis of the framework; a Conceptual Model that specifies the elements that define the domain of organizational collaborative systems; a Generic Component Model for developing high-level of abstraction components for modeling new systems; and finally, a Technology Architecture that facilitates the implementation of functional collaborative systems from previous components.

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2.1 Conceptual Model
The conceptual model we propose consists of three metamodels for three subdomains that we have named as Structure, Activity and Instrumentation.

- The Structure metamodel defines the elements for modeling the static part of a collaborative environment like the internal organizational structure or the existing roles.
- The Activity metamodel provides the elements for modeling the dynamics of an organization, like those related to business processes.
- The Instrumentation metamodel includes the elements for modeling tools that are generally used in collaborative systems, like workspaces, applications or resources.

Figure 1. The Activity Metamodel.

2.2 Generic Component Model
Our framework includes a Generic Component Model that allows satisfying three main problems:

- Provide a connection between the modeling processes of collaborative environments with the subsequent implementation process.
- Provide a mechanism for specifying the requirements of interactivity and collaboration characteristic of groupware.
- Encourage the incorporation of features of adaptability and reusability to end systems.

This approach allows modeling from the initial metamodels included in the Conceptual Framework, and obtain generic components containing all the information required to generate the final organizational collaborative system, but without considering technological information. These generic components can be modified later, by adding technology platform dependent information to obtain functional non-generic components.
In our proposal, initial models are implemented using XML-Schemas, generic components are built by means of XML Files that contain information not dependent on technology, and finally the non-generic components are obtained by adding new technology dependent information. Figure 2 shows this process:

2.3 Technology Architecture

The three fundamental elements that set up our proposed architecture are:

- **A Service Model** that defines the capabilities that technology architecture must provide to the components developed, so that they can invoke the high-level operations that are needed to perform interactive and collaborative processes.

- **An Execution Model** whose implementation focuses on an engine that allows the processing of generic components, providing the necessary support to execution of interaction and collaboration processes, and providing adequate support to meet the requirements of adaptability and extensibility required by end-users to modify the collaborative environment.

- **The Communication Model** defines the notifications that can take place within the organizational collaborative environment, and how these notifications should be managed by the underlying system, so that users can carry out communication and collaboration processes, and manage the transference of adaptations and extensions of the environment that are performed by any user in a given time.

3. CONCLUSIONS

We have presented a framework that facilitates the development of adaptable and extensible collaborative organizational systems. The proposed framework allows the incorporation of end-users to the development process through an approach based on combining the principles of certain paradigms as Model Driven Architecture and Component Based Development. From the obtained results, and from the particular opinion that the paradigm of Cloud Computing will become increasingly important for organizations, our future work will focus on adapting the proposed framework to new Cloud Computing environments.

4. ACKNOWLEDGEMENTS

This work has been developed within the context of the project EDUCATIONAL PROG (TIN2011-29542-C02-02), funded by the Ministry of Science and Innovation (Spain).

5. REFERENCES


