

Chapter 13

Developing a Web-Based Cooperative Environment to Software Project Development

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ABSTRACT

A software project is developed by collaboration of some expert people. However, the collaboration puts obstacles in the way of software development when the involved people in the project are scattered over the world. Although Internet has provided a collection of scattered islands in which the denizens of the islands are able to communicate with each other, it lacks full requisite qualifications for the collaboration among the denizens. The emerging idea is that a supportive environment should be developed on the Web for providing full requisite qualifications and facilitating collaboration. Towards providing such an environment, this chapter aims to present a framework exploiting Open Hypermedia System (OHS) and a Web-based collaboration protocol. OHS assists in saving and restoring artifacts constructed by the scattered people, and the protocol provides channels to concurrent communication and distributed authoring among the people.

INTRODUCTION

Software intensive systems such as airspace, telecommunication and stock systems are the systems where software is their main part. In other words, daily efforts of present-day people

increasingly depended on the systems in which software plays the main role. Development of such systems without collaborative effort is a difficult task. However, bringing together the scattered collaborators under a same roof is an obstacle to collaborate. Distance between collaborators, acclimatization of collaborators to their environment

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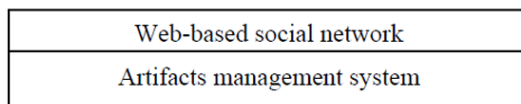
and their familiarities with own tools are some restrictions of physical gathering. World Wide Web has brought down the restrictions by providing a distance communication among the people.

Although Web has facilitated distance and virtual collaboration among the people, it wants more capabilities. This chapter aims to present a framework to furnish the capabilities on the Web. To this end we should: (1) Create a social network among people is distributed through the Web and (2) Manage artifacts created by collaborators. The framework aims to provide an environment to support software product from idea to the production maintenance on the Web. The environment: (1) obviates organizational hindrances existing in the way of collaboration, (2) enables the end user to participate in analyzing requirements, (3) enables the involved expert people to examine, recognize and document problem and to present recommendations for production, (4) enables distribution of software and reduces costs needed to complete the production.

In fact, Web-based collaborative software development is a new kind of social effort in a virtual organization that is not limited to certain geographical locations and membership. However, the present-day Web is used to read and review information and so has no enough qualifications to fulfill the aim of social network of software development. Synthesis and production of software intensive systems, design of industrial products, authoring books and technical documents are typical teamwork include a *common purpose*, a *common data space*, *collaboration tool* and involved people.

Consider Figure 1. The first part is responsible for supporting: (1) users' activity consisting of

Figure 1. Web-based collaboration



constructing and modifying their documents using tools like Web browsers and (2) some mechanism to simultaneous access to the documents. The second part: (1) is responsible for supporting the communication between Web users and artifacts management system (AMS) and (2) includes the artifacts management system. The system including a repository for users' documents, manages relation among them. Figure 2 shows more detail of the proposed framework and Table 1 shows tasks of each part.

Artifact management system which is in fact the main part of the model will process users' request, support non-concurrency collaboration between them, and appropriately maintain compatible links and contents of repository and cope with users request through reacting with repository to store, access or editing components. The parts tasks are shown by Table 1.

Repository management is not solely a management for component maintenance, because in this model we try to make component to possible support of consistency between components and its proper reservations. Therefore it should be noted that though the management of components the users' construction and consistency between them is the task of management layer, i.e. the forth layer, there are some relations, between components, which are not solely structural relations but they are conceptual relations, the consistency of which should be provided by repository management.

For example, the programmer wishes to construct the compiled program file or an executable program file and tries to establish link between these constructions and also their links to their required data which are conceptual relations. Support of development environment without developer's request and establishment of such links automatically, will be effective in implementation phase of system both for construction and production of programs in view of:

- Releasing developer's power and energy considered to environment problems and

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