Virtual Epicenter: Web-Based Real-Time Collaborative Platform for Self- and Project-Management

Răzvan Rughiniş
Faculty of Automatic Control and Computers
Univ. POLITEHNICA of Bucharest
Bucharest, Romania
razvan.rughinis@cs.pub.ro

Daniela Ene
Faculty of Automatic Control and Computers
Univ. POLITEHNICA of Bucharest
Bucharest, Romania
daniela.a.ene@gmail.com

Mihai Bucicoiu
Faculty of Automatic Control and Computers
Univ. POLITEHNICA of Bucharest
Bucharest, Romania
mihai.bucicoiu@cs.pub.ro

***Abstract*—We present Virtual Epicenter (ViEpic), a simple and easy to use solution for self-management, project-management and computer supported collaborative work. ViEpic combines several features to support effective organization: collecting ideas; workflow planning with multitasking; delegating actions and reporting; setting meetings and making collective decisions; file uploads and sharing; integration with Google APIs. ViEpic implements the "Getting Things Done" and ITIL principles in an online environment for effective team collaboration.**

Keywords- project-management; self-management; computer supported collaborative work.

I. INTRODUCTION

Since the mid-1980s, organizations have been turning to Information Technology Infrastructure Library – ITIL [1] to achieve IT service excellence. ITIL is a set of concepts and best practices to manage IT development, infrastructure and operations. It consisting of a library of five books similar in nature to PMI's PMBOK Guide [2] that outline each phase of the service lifecycle: Service Strategy, Service Design, Service Transition, Service Operation, and Continual Service Improvement.

The ITIL Project Management stages are: Project Initiation, Project Planning and Coordination, Project Control, Project Reporting and Communication. Project Initiation is used to define the key stakeholders, responsibilities and resources available. Also, users can specify risks and constraints. The Project Planning and Coordination stage serves to coordinate activities and resources during project development, and to verify that planning is in accordance with organizational Project Management guidelines. This stage triggers detailed planning for future activities. Project Control serves to monitor project progress and resource use, and to readjust the project if necessary. Project Reporting and Communication serves to provide an overall summary.

We propose a project management tool, Virtual Epicenter – ViEpic, which implements the four ITIL stages taking inspiration from the "Getting Things Done" approach [3]. This set of recommendations puts in practice the idea that people should move tasks out of their mind and record them, since remembering matters less than successful task performance. The most important steps in implementing the "Getting Things Done" strategy are:

- Capturing all tasks and ideas in a task management system;
- Creating context lists for all actions, along with a project list and a Someday/Maybe list.

II. RELATED WORK

Work in many companies has become increasingly project-based. This process has generated a need for efficient project management tools, for different kinds of users and for diverse work environments. There are many products on the market; some of the most popular from which we took inspiration are Basecamp [4], Jira [5] and Comindwork [6].

Basecamp [4] is web-based management software focused on sharing and team collaboration. This application can be used to organize one's individual activities into projects and tasks, and it can also be used for team project management. The principal features include: managing projects and tasks, organizing and sharing documents, milestone management, inspecting one's work on a calendar timeline, and a messaging system for collaborators.

Jira [5] is a web-based project management solution for bug tracking and for agile planning. It has a clean and fast interface for organizing issues, with customizable characteristics. Its principal features include: submitting and tracking issues, setting specific deadlines, accessing reports to visualize project evolution, Wiki and collaboration, file attachment, and compatibility with popular services such as Salesforce and Google Apps.

Comindwork [6] is an application for project and team management, scalable for large businesses. Its principal features are: managing projects and tasks, Wiki, organizing projects by milestones, reporting mechanisms, managing members, log time for tasks, and file sharing.

III. VIEPIC ARCHITECTURE

ViEpic is structured according to the five workflow stages of the "Getting Things Done" method: to collect, to process, to organize, to review, and to do. The collecting phase is represented by the implementation of the "In Basket". Users will easily be able to add tasks that have to be completed without having to associate them with a certain

project, or having to fill in the start date, end date, and other details. Users can process their “In Basket” list later, filling in the needed information. In the “Process” stage the “In Basket” list is emptied. For the “Organize” stage we use projects, tasks, "In Basket" lists, a calendar and reporting mechanisms.

The application modules that implement these stages are: Dashboard, Projects, Tasks, Scheduling, Meeting, Contacts, Files, and Calendar (see Figure 1).

Dashboard offers a quick overview of the entire workflow. Here, one’s projects, tasks, tasks’ status, choices to make, and the In Basket can be easily examined. The **Projects** module displays all projects in which the user participates. The **Tasks** module displays all user’s tasks and their associations with projects.

The **Scheduling** module implements the "Getting Things Done” approach: users see all In Basket items and are able to add elements from this list as tasks. This list is distinguished from the Tasks list (and it is not displayed in the same menu) because it contains a different type of elements, which first have to be planned in order to be added in the task list.

The **Meetings** module is a key element for collaboration. If more than one person works for a project, multiple collaborators must have a voice in the decision making process. Therefore ViEpic includes a section where users can decide on common outcomes.

To have a good overview on the tasks with a specific date one uses the Calendar section. The “Getting Things Done” approach supports a “first things first” strategy, in which people should focus on a specific task or meeting in the moment when they actually have to start it. In this section the actor will view the ViEpic calendar with all the tasks that have a specific Due date. The **Contacts** tab provides an overview of relevant people and helps dividing them into target groups, according to project-based criteria. The **Files** module supports knowledge transfer: users have a specific tab where they can upload files and group them in folders. The files/folders will be uploaded to the user’s Google account (as Google Documents).

IV. Implementation

Virtual Epicenter is implemented through several programming languages and libraries: JavaScript, jQuery, DOM, cookies, and Ajax. Their use is illustrated below.

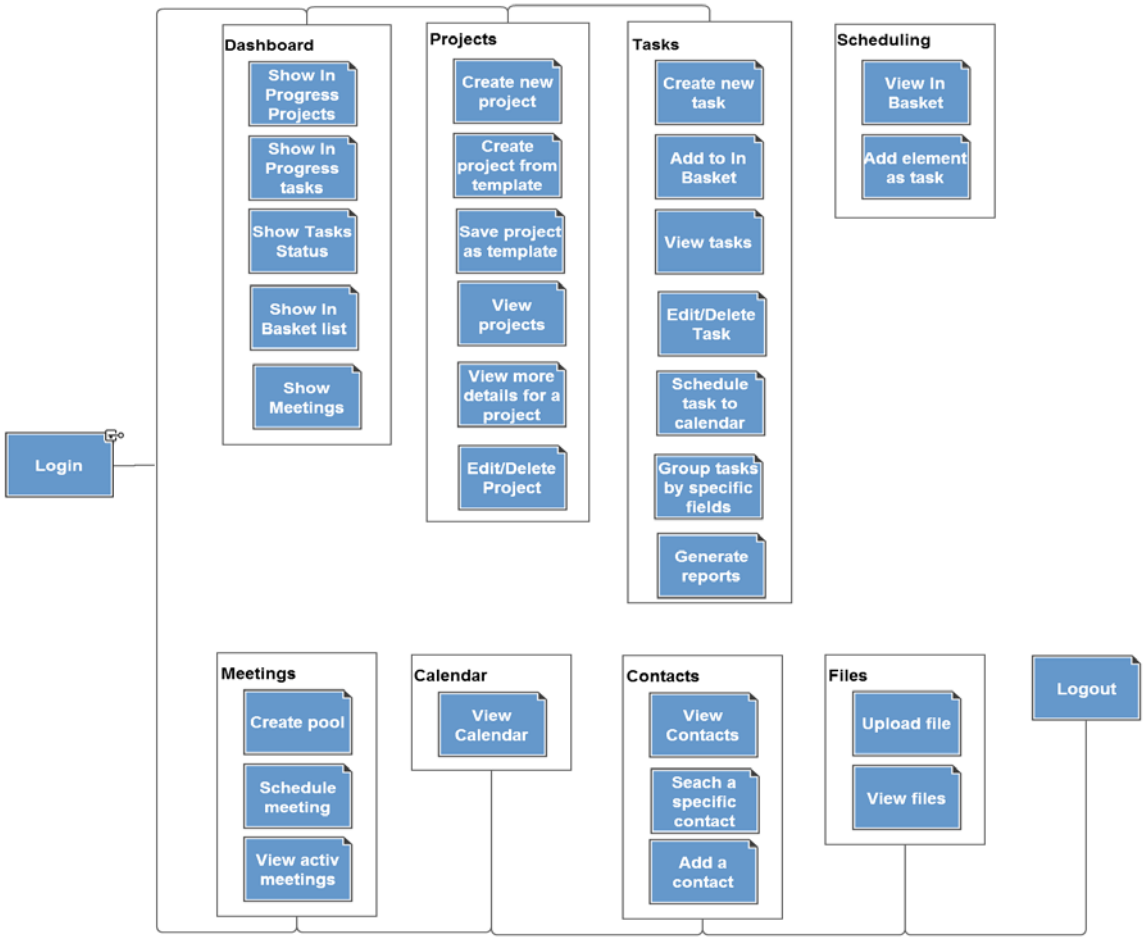

Figure 1. Virtual Epicenter - ViEpic Architecture

JavaScript is a dynamic programming language that facilitates the interaction between a user and an application. For example, this language can be used to make a table slide on mouse over/mouse out. The “showmenu()” function, called on the “onMouseOver” event, modifies a HTML property for the element with “slideMenu” id. This functionality is used in ViEpic for an easier interaction with the user, by masking certain features which are not always used. For example, users do not add new tasks every time they analyze their task list, and they do not always change the windows appearance in the Dashbord tab.

jQuery is used to manage the development of an interface that meets Web 2.0 standards and to allow a normal flow when working with this application. jQuery is a cross-browser JavaScript library designed to simplify the client-side scripting of HTML [7]. The jQuery UI [8] [9] is a free, open-source JavaScript library that provides complete, interactive elements, animations and widgets. ViEpic relies on several jQuery UI effects such as: drop down menus, dialog windows drag and drop elements, animations and form validation.

One of the most used tool jQuery offers is jQuery Selector. This is valuable for matching an element or a set of elements in a HTML document with specific criteria such as an id name, class name or a tag name. The jQuery tool is very useful in ViEpic because most of the data displayed is generated automatically after a request in MySQL. With these selectors, it can build all tabs after obtaining the needed information. All this new information is appended to an existing element (a div) in HTML code. jQuery also offers the possibility to use the same selectors as in CSS.

Users can personalize what they can see in the Dashboard menu. To implement this requirement ViEpic uses the jQuery dialog window. This is a floating window that contains a title bar and a content area. The dialog window can be moved, resized, and closed with the 'x' icon by default. The most important parameters of a dialog window included in ViEpic are: *autoOpen, height, width, minHeight, minWidth, draggable, resizeable, show, hide*.

One of the functionalities of ViEpic is a smooth user interaction. Users can add different data in their account, and receive warning messages depending on their actions. To implement these options ViEpic uses modal windows from jQuery. For adding projects and tasks one needs a window in which users cannot interact with other page components. In implementing this feature a jQuery modal form is used, a dialog window that has modal behavior.

Visual elements have a big impact on users. ViEpic emphasizes the time left in a project/task by using a jQuery progress bar. This is designed to display the proportion of a process that is completed. The percentage is determined using "Start Date", "End Date" and the current day. jQuery modal message is used to warn users that a certain action will happen conditioned on their current decisions.

ViEpic relies on different information organized in tables. Therefore, the Document Object Model (DOM) is employed to dynamically add HTML. DOM is an API that provides a structural representation of the document, enabling the developer to modify its content and visual presentation by using a scripting language such as JavaScript.

In ViEpic substantial information (details about projects, tasks, In Basket) is stored in a MySQL database. PHP classes are used to retrieve this information and to display it. PHP is a Server-Side language and JavaScript is used as a client-side language. Because of this, PHP functions cannot be used in JavaScript to show database information. Ajax (Asynchronous JavaScript and XML) [10] is used to solve this issue. Ajax is a method for creating dynamic web-based platforms. One of the most important characteristic is that is asynchronous. As a rule, after a user loads a page, the page content stays unchanged. With JavaScript and Ajax new content can be added to the page without refreshing it. This is useful to increase speed and interactivity. Ajax does not need a special plug-in to run; it requires only JavaScript enabled browsers and it is mainly executed on the user's computer. In this application, Ajax is used to: add/edit/delete projects, add/edit/delete tasks, schedule tasks, and add items in the "In Basket" list.

V. Scenarios of Use

A. Dashboard Customization

The first step in using ViEpic is login. After credentials are verified in the database, users can access the main page - the Dashboard. To have a better perspective of their projects/tasks, they can add windows with different details from a slide menu. The windows that can be added are: project list, task list, statistics with tasks status, In Basket list, doodles list. A user can add, delete, move, or resize a window from the Dashboard. Figure 2 presents the scenario of adding a window with projects; others are similar.

B. Process "In Basket"

The In Basket functionality has two parts: 1) adding tasks to In Basket and 2) process the list. The first functionality is implemented in the Tasks tab. When users add tasks they can also specify actions which are needed, but which at the time cannot be completely described or planned. The second functionality is implemented in the Scheduling tab. The list can be processed thus planning the elements and adding them in the Tasks list (see the illustration in Figure 3).

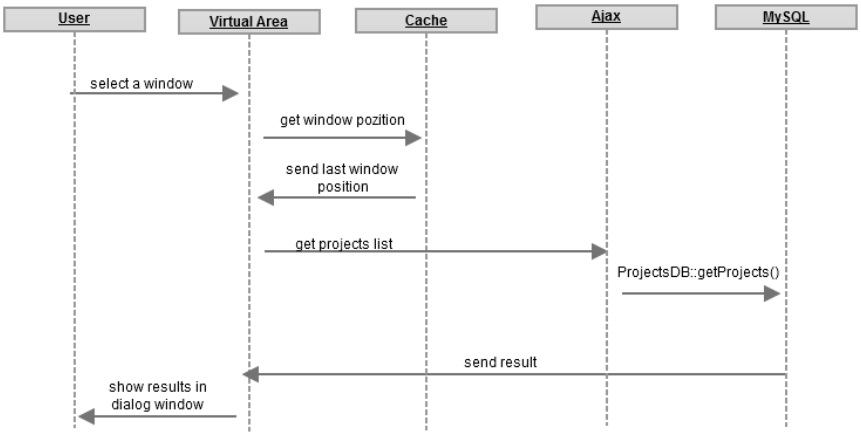

Figure 2. Adding a window with project list to Dashboard

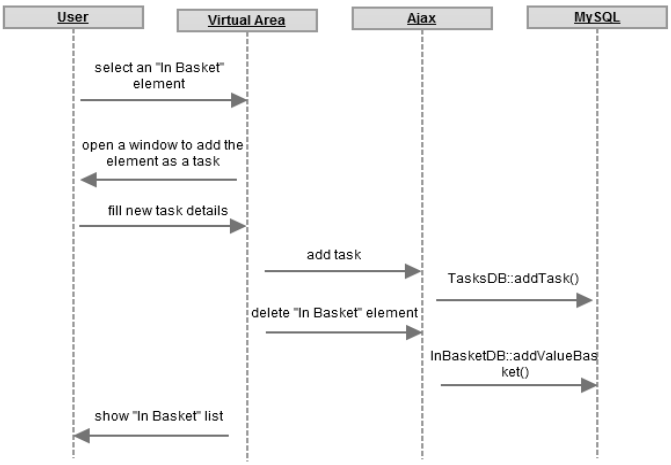

Figure 3. Add an "In Basket" element to Tasks

VI. CONCLUSIONS

Virtual Epicenter offers a solution for efficient self-management and project-management, enabling users to focus on actionable priorities by collecting and organizing myriad ideas into projects and tasks, planning and monitoring execution, collaborating and sharing. The ViEpic architecture combines the Getting Things Done approach with ITIL stages in designing a flexible, collaaborative instrument.

ViEpic currently offers real-time, simple, and easy-to-use tools for managing activity flows. Future improvements include: a Wiki section, saving reports in a chosen format, and a system for monitoring collaborators' workload.

REFERENCES

[1] Cabinet Office, *ITIL Lifecycle Suite*, The Stationary Office, July 2011

[2] PMI - Project Management Institute. *A Guide to the Project Management Body of Knowledge (PMBOK Guide)*. 5th Edition. 2013

[3] D. Allen, *Getting Things Done - The Art of Stress-Free Productivity*, Penguin Books, December 2002

[4] Basecamp (http://basecamp.com/)

[5] Jira (http://www.atlassian.com/software/ondemand/overview)

[6] Comindwork (http://www.comindwork.com/)

[7] D. Flanagan, *JavaScript&jQuery: The Missing Manual*, O'Reilly Media, 2011

[8] jQuery UI documentation (http://docs.jquery.com/UI)

[9] E. Sarrion, *jQuery UI*, O'Reilly Media, March 2012

[10] R. Riordan, *Head First Ajax*, O'Reilly Media, 2008