

Software Analysis

Team analysis was restricted to three popular open source project management software packages pre-selected by a team member who was particularly familiar with the products: Redmine, Project Open and Projector. All three programs are widely used and have been found by users to be effective for planning projects of various types.

Inventory of Features

Another team member perused multiple samples of project management software in order to collect a list of features viewed as highly desirable by project management teams. Those features were divided into seven categories common to both open source and commercial project management software programs: (1) General project management, (2) Resource management, (3) Document management, (4) Workflow management, (5) Issues management, (6) Budget management, and (7) Reporting and analysis. A number of individual features were identified within each of the seven categories.

First, within the category of General project management, eight key capabilities were identified, including the ability to use the software to define tasks, assign tasks, set task deadlines, schedule multiple instances of a task, allocate time per task, provide project cloning, provide sub-project options, and link independent tasks. Analysis by all team members confirmed that all three software packages offered all eight of these capabilities.

Next, with respect to the category of Resource management, eight additional capabilities were determined to be essential for project management software, including the ability of users to control who would have access to a project, allocate resources, track those resources, provide task sharing, provide a user dashboard that would allow each user to view his or her tasks, allow viewing of tasks from any phone or web browser, provide for collaboration among team members and customers, and provide instant communication between team members and between team members and customers. Team analysis revealed that, while the three project management software packages went about accomplishing these tasks differently, all eight of the features were accounted for in all three software packages analyzed.

As regards document management, six capabilities were identified as being key to project management, including the capability to provide document uploading, allow real-time editing, allow synchronous editing, store documents, record descriptions of activities, and allow attachment of additional documents (e.g., spreadsheets files, presentations). Team analysis determined that all three software packages provided for uploading and storage of documents as well for creating descriptive records of activities and attachment of additional documents. However, none of the packages reviewed provided real-time editing or

synchronous editing. The latter two capabilities, common to professional commercial project management products, would be a welcome addition to the open source programs reviewed.

Under the category of Workflow Management, ten capabilities were seen as essential, including the capability of the software to schedule meetings, allow calendar sharing, allow shared calendars, provide contact lists, allow sharing of information on work flow (e.g., workload distribution, holidays), track time spent on each task, request time sheets, receive time sheets, allow flow of time sheets into the project plan, and allow collection of the number of hours worked per team member. All three software programs were found to allow shared calendars, to allow sharing of information on workflow and to allow collection of the number of hours worked per team member. Redmine and Projector also offered capabilities for scheduling meetings and calendar sharing, while Project Open did not. However, while Project Open and Projector offered features for creating contact lists, Redmine did not. Finally, only Project Open offered the capabilities for requesting and receiving time sheets and allowed for the flow of times sheets into the project plan. Clearly, Project Open offered the highest number of key features, (8 out of 10) while Projector offered seven and Redmine only six.

The area of Issues Management had the highest number of essential elements; some 11 features were taken into account, including the capability of the software to track tasks and comments, rate priorities and difficulties, allow team members to receive role-based text messages, email updates and changes to an existing issue, track bugs, store lengthy descriptions and bug resolution, manage issues, provide a user-friendly interface, provide for communication of obstacles among project users, and provide early warning of risks associated with a project. None of the three open source software packages contained all the desired capabilities; however, Redmine was found to offer all but one of the attributes, i.e., it was missing only the capability to provide early warning of risk associated with a project. In fact, only Projector offered the early warning feature. All three packages were found to be useful for tracking tasks and comments and rating priorities as well as for tracking bugs, storing lengthy descriptions related to bugs and providing for communication of obstacles among project users. Neither Project Open nor Projector was found to be capable of emailing issue-related updates, while Redmine was, and only Projector was incapable of emailing updates and changes to an existing issue. While Redmine was found to contain the highest number of features in the Issues Management category, Project Open had nine of the 11 features and Projector only eight.

The Budget management category only included four main features, i.e., the capabilities of tracking budget versus real-time costs, performing cost maintenance, providing free software training, and generating invoices. Redmine was found to have no budget management features while Project Open had them all. Projector, on the other hand, was found to be able to track budget versus

real-time costs, perform cost maintenance, and provide free software training. Projector did not have the capability of generating invoices.

Finally, in the category of Reporting and Analysis, seven key characteristics were seen as essential: providing a mind map option, task analysis, a Gantt chart option, an Impact Matrix, a Mitigation Plan option, a Project Evaluation option and documentation of historical information (e.g., project progression and analysis). This area was found to be the weakest for all three open source software packages. For example, none offered a Mind Map option, a Mitigation Plan or a Project Evaluation feature. However, all three featured a Gantt chart option. Project Open and Projector also offered capabilities for Task Analysis and for creating an Impact Matrix while Redmine and Projector offered capabilities for documenting historical information while Project Open did not.

Summary

Team analysis clearly showed that Project Open possessed the highest number of key features of the three open source project management software packages analyzed. Our research showed that Redmine was strongest in the area of Issues Management, and struck us as a software package particularly well suited for debugging software during and after the development process. Projector was not strongest in any of the seven categories; however, it was found to offer a very high number of key features. The software package with the most attributes consistent with our Inventory of Features was Project Open, which was strong in all major categories. While calendaring features and some reporting and analysis features were missing, the package offered most desired characteristics, including all four budgeting capabilities.

Qualitative Analysis: Usability

In order to determine relative quality of the three open resource project management software packages, each team member assessed the quality of key features identified in Redmine, Project Open and Projector. Ratings were assigned according to a 5-point Likert scale in which “1” represented poor quality and “5” represented “good” quality for each of the 54 key features. In the analysis below, we first give consideration to the quality of the key features as seen in each software program. Then, the project team offers its overall recommendations with respect to each of the three open source software programs.

Redmine

All members of the project team recognized that Redmine featured many very important elements and was particularly strong in the category of Issue Management. However, Redmine was not found to be particularly user friendly, especially for potential clients unfamiliar with technology. Usability is, therefore, a

key area of concern for those interested in using Redmine. Team members rated Redmine as “average” for many features. That is to say that while the software contained many targeted features, they were no easier nor no more challenging to use than were the same features in the other two packages. However, team members rated some Redmine features as “below average” most often because they were not user friendly. For example, while Redmine offered the capability of scheduling multiple instances of a task, accomplishing the task was viewed as somewhat awkward since users needed to record a new issue and then schedule that issue on multiple dates. While a copy function was available at the bottom of the page, reviewers reported that it was not easy to find. Additionally, the processes for emailing updates and changes to an issue were found to be clunky as they involved first selecting the “Settings” option followed by selection of “Members.” Then, after selecting team members’ names from the Members list, email messages could be composed and sent out.

A general difficulty in determining how to use the Redmine software for specific key functions became apparent for other features as well, notably for collaboration elements. There were two ways to access collaboration features, i.e., through the use of wikis and forums found within the program. However, no other specific collaboration features internal to the software were apparent. Finally, with respect to Workflow Management capabilities in Redmine, reviewers noted that the only way for team members to view each other’s progress was by accessing the calendaring system where updates were automatically annotated. Otherwise, individual team members were only able to see their own workflow progress. Reviewers rated a few of Redmine’s features as “above average” to “good,” especially with regard to collaboration. Reviewers found that Redmine offered two options that the other software programs did not: (1) A “watch” feature that allowed stakeholders to view project progress without any annotating or editing capability and (2) a newsfeed option that allowed project managers to announce milestones as they were accomplished.

Overall, reviewers agreed that Redmine represented a bare-bones project management software program best suited for software development projects in which debugging is a major concern. Nonetheless, the team also agreed that Redmine could be used for general project management if users were aware of some of the complexity involved in accessing certain key features.

Projector

Reviewers identified Projector as having a larger number of key project management features as compared to Redmine. In addition, the layout of the Projector pages included an extensive set of icons intended to facilitate easy access to key elements of the software. As was the case for Redmine, reviewers rated most Projector characteristics as “average” because those characteristics, while present, were no more user friendly nor productive than were the same features represented in the other two software programs.

Some Projector features were evaluated as “below average” or “poor” due to errors in the software or difficulty using the program elements. For example, reviewers noticed that the large number of icons intended to make the program easier to use, had the opposite effect, i.e., individual icons were difficult to identify and the large number of icons required more thought processing time to determine which one to use for a specific function. Moreover, as regarded task analysis, reviewers found that, while the tasks were listed, getting detail on each one required clicking on each individual task, contributing to an overly complex process. And, even though Projector provided for inclusion of historical documentation, only recent activity was shown. To get more detail, users had to go an extra step and run a complete report. Software errors were also prevalent, especially for features that would allow viewing of tasks from mobile devices and for the online training manual. The prevalence of bugs and complex usability contributed to an overall determination that the software did not present a user interface that promoted easy use by nontechnical project team members.

On the other hand, reviewers rated some features of Projector as “above average” and “good,” with respect to the other software packages reviewed. First, task scheduling was superior in Projector as compared to Redmine and Project Open because the feature in Projector allowed specifications to be set on what parts of a task should be copied. Furthermore, Projector’s capability for allowing individual users to record their own costs and expenses was viewed as very efficient and easy to use. Finally, the project-planning button was seen as an easy-to-use tool for recording information about project resources.

All in all, reviewers’ analysis determined that Projector offered more key features than did Redmine. While many of the features were no easier to use nor more difficult to use than were the same features in the other two software packages, some advantages of Projector included superior task scheduling, task analysis, and expense reporting. Technical users who are aware of existing bugs and who are comfortable handling use complexity issues with a limited users’ manual should be able to take full advantage of Projector for managing a wide range of projects, including those that require budgeting as well as reporting and analysis features. Email communications may be better handled using programs outside the Projector program until the bugs are resolved.

Project Open

Reviewers reported the most positive findings for Project Open software. Not only did their analysis show that Project Open offered the highest number of key features, a total of 44 out of 54, or 81.5%, (as compared to 42 out of 54, or 77.8% for Projector and 39 out of 54, or 72.2% for Redmine), but also that Project Open was easier to use and freer of bugs than the other two project management software packages.

Reviewers rated most key features of Project Open as average, in keeping with their finding that similar features in Redmine and Projector functioned similarly and that Project Open offered no special additions. Reviewers reported no key negative usability issues for Project Open. All features were rated “average” to “above average” to “good.” In fact, Project Open received the highest number of superior ratings of all three software packages. Reviewers were especially impressed by the ease of use of the dashboard feature, which allowed for completion and submission of time sheets and their assignment to particular cost centers, projects and users, and for calendar sharing, which allowed for contact with any person associated with a project right from the calendar page. In addition, reviewers found that not only did Project One allow for flow of time sheets directly into a project, but it also allowed distinction between the projected time spent on a project task and the actual time spent. The budget features were viewed as advantageous and allowed both planned and actual cost entries to be recorded. Finally, reviewers reported finding that Project Open was the only software package that allowed viewing of projects from the web, thereby facilitating access from mobile devices. Generally, reviewers concluded that the software seemed to be easy to use even for the non-tech savvy and was the only one of the three project management software programs capable of integrating invoicing and workflow management. Team communication tools were described as flexible, allowing also for communication between team members and clients.

Generally, reviewers found that Project Open offered most of the key features of commercial project management software. They also gave Project Open the highest usability rating. Many of the features reported as missing from Project Open were also not found in Redmine and Projector. These included real-time and asynchronous editing and the Mind Map, Mitigation Plan, and Project Evaluation options. Lack of a capability to send role-based messages to team members, a key feature found in Redmine, and lack of a capability to provide early warning of risk associated with a project, a key feature found in Projector, weakened Project Open with respect to commercial project management software. Therefore, users interested in Project Open would be obliged to work around those particular issues.

Summary

Reviewers found that all three open source project management software packages, Redmine, Projector and Project Open, represented valid alternatives to expensive commercial project management software programs. While ease of use varied across the three software programs, reviewers did not reject any of them on that basis. Even though consensus indicated that the bare bones Redmine package was best suited for software development projects, its relative ease of use also served to make it a viable option for other types of project management endeavors. Projector was also recommended by reviewers for its long list of key features and, and in particular, for its user-friendly budget management elements. The reviewers’ highest recommendation was given to

Project Open because it offered the greatest number of key features with the highest usability rating overall.