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**DIPLOMA THESIS  
ANALYSIS OF PROJECT MANAGEMENT INFORMATION TOOLS**

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## **DECLARATION**

I, Davor Martinović, hereby declare that I am the author of this undergraduate thesis written under the mentorship of dr. Aljaž Stare. I permit the publication of this thesis on the faculty's web pages.

In Ljubljana, \_\_\_\_September 2010\_\_\_\_

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## INTRODUCTION

The Project Manager is expected to integrate all aspects of the project, ensure that the proper knowledge and resources are available when and where needed, and above all, ensure that the expected results are produced in a timely cost-effective manner. (Meredith & Mantel, 2005, Project Management: A Managerial Approach).

To achieve this, Burke (Project Management - Planning and Control Techniques, 1999) feels, a fully integrated information and control system needs to be developed, to plan, instruct, monitor, and control large amounts of data, quickly and accurately to facilitate the problem-solving and decision-making process.

In today's constantly changing environments this can only be achieved using project management software. This can help manage resources, produce schedules and the WBS matrix, along with calculating the critical path plus much more. It's even possible to integrate it into the companies own information system, thus further improving its reach and ability.

Projects are becoming more and more the way organizations get things done. This isn't to say that projects and project management is a new field. Projects have existed since the dawn of time. The pyramid builders faced the same questions of quality, scope and limited resources as today's builders, engineers and programmers do in their projects. But it is to be said that we as individuals to have a need for better project management in our own projects just as much as any small, medium sized or large organization.

But with this abundance in software tools we arrive to a problem that users face. Which tools to choose and following which criteria. Nemec-Pečjak (Informacijska podpora projektnemu managementu, 2009) tried to capture this problem in his document information support for project management, where he identified one hundred different software packages for use in aiding project management needs. No user wants to go through the selection process of identifying which of these is the right one for his needs. In my analysis I want to help answer these questions and provide some insight into the software that is available.

The subjects of our research are project management software packages. Projects need information support in order for the management to take informed decisions. Nowadays with the abundance of information at hand this support can only come from an information system. An information system is an integrated set of components for collecting, storing, processing, and communicating information. But not all organizations want to have a complete solution for their information as it usually requires a high investment in resources and software to accomplish their tasks. It is important to include these needs into the analysis. They also want to be more mobile in their usage of project management software. This includes not being locked into a desktop application as well as being able to use it through the newly popular

mobile devices like their smartphones, netbooks and now tablet computers. Interaction with colleagues and other stakeholders in the project is also of importance, which is where the social web is finding its way into project management.

The objective of my work is to analyze project management software packages in order to give clarity on the subject and a better way on how to choose the software for particular needs. For this I need to describe what the theory holds on information systems and how it differentiates these from information tools. Only then can I apply this to project management software.

For the goals of my work I have set out to give a description on the role of project management software as well as give an insight on how users view project management software packages and introduce the reader to the more innovative solutions in the market. Since it is so hard for users to choose the right software to suit their needs I will in the end propose for whom these solutions are best suited for.

The method of analysis involved getting familiar with the theory and then drawing upon that to have the tools necessary for analyzing the software packages. I had to describe the difference between an information system for project management and a tool as well as describe what project management software is. Included are also surveys on the topic of user's experiences with project management software packages. These provide an insight on how the software is viewed at by its users and what they see as useful and what is lacking. The packages I have tried myself and analyzed with the theoretic knowledge I had gained.

The structure of the thesis consists of the introduction on project management and its tools where I describe the already mentioned distinctions on the project management information system, its tools and the software packages. This transition allows me to go from project management information systems, through the tools that are used in the software to the software packages themselves. After that I analyze the market in which I summarize the surveys on the topic of user's experiences. After that I analyzed open source packages that are freely available and on demand software that is licensed with a subscription plan. At the end of this I present the list of analyzed software categorized by its availability. Lastly I give a summary of the software reviewed and conclude the use cases that would benefit from the software the most.

## **1 PROJECT MANAGEMENT AND ITS TOOLS**

### **1.1 WHAT IS PROJECT MANAGEMENT**

Before we can address the needs in modern project management software, we need to first

understand the core concepts that underlie the discipline being researched. So what is project management and what are projects exactly.

Let's look at how the PMBOK describes the two. Firstly a project is a temporary endeavor undertaken to create a unique product, service, or result. This is a bit short so we will add to this definition a more detailed one.

A project is a broad endeavor (undertaking, work, activity) of people, conducting interwoven activities and using different resources (Rozman, Stare, 2008). It is characterized in the uniqueness of the result: product or service, time constraint of the entire endeavor, and the cooperation of many different members and other resources. The uniqueness is in its non-repetition. The time constraint means that each project has a starting and finishing event. And by the cooperation is meant that the project activities can run at the same time in a parallel way, and can consist of more sub-projects. In order for these to latter align the cooperation of different members and other resources is needed.

Project management on the other hand the PMBOK describes as the application of knowledge, skills, tools and techniques to project activities to meet project requirements. Project management is accomplished through the application and integration of the project management processes of initiating, planning, executing, monitoring and controlling, and closing. The project manager is the person responsible for accomplishing the project objectives.

Managing a project includes:

- Identifying requirements
- Establishing clear and achievable objectives
- Balancing the competing demands for quality, scope, time and cost
- Adapting the specifications, plans, and approach to the different concerns and expectations of the various stakeholders

Project managers often talk of a “triple constraint”, project scope, time and cost, in managing competing project requirements. Project quality is affected by balancing these three factors. High quality projects deliver the required product, service or result within scope, on time, and within budget. The relationship among these factors is such that if any one of the three factors changes, at least one other factor is likely to be affected. Project managers also manage projects in response to uncertainty. Project risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on at least one project objective (PMBOK 2004; Project Management Body of Knowledge 3.0).

In a pure technical meaning project managers coordinate different activities (and employees at the same time). However, they also coordinate project members: their activities, responsibility

(interests, goals), authority, communication. Compared to repetitive production the prevailing coordination within projects is horizontal and less vertical. It relies on referent power and less on the power of position.

What should also be noted is that in contrast to business as usual the temporary nature of projects stands out, which in practice leads to the management of the two systems to be quite different and as such requires the development of distinct technical skills and the adoption of separate management.

Like in classical management, projects are planned, actuated and controlled at the organizational level. Throughout the whole cycle leadership is implemented in order to guide from start to finish. In the planning phase time, resources and costs are planned as well as duties, responsibilities, authority and communications, while additionally risk is assessed. Planning the organization or organizing the project is what follows. However, all this planning is in vain if it is not followed by its actuation or activating or implementation. To actuate the plan we have to recruit and develop people, and lead them. The leadership in a broader sense depends on motivation, communication and leadership. The last step is control, which is the process of monitoring, evaluating, and comparing actual results with the project plan to determine the progress toward the project cost, schedule, and technical performance objectives. It is done in three steps, measuring the progress towards an objective, evaluating what remains to be done and taking the necessary corrective action to achieve or exceed the objectives, to correct an unfavorable trend or to take advantage of an unexpected favorable trend (Rozman & Stare 2008).

Therefore project management is defined as an organizational process on projects, which, coordinates activities, project members, financial means, plans, actuates and controls in order to assure timely, efficient and quality conduct of projects and makes decisions on activities, members, costs etc.

## **1.2 PROJECT MANAGEMENT INFORMATION SYSTEM**

An information system is an integrated set of components for collecting, storing, processing, and communicating information. Business firms, other organizations, and individuals in contemporary society rely on information systems to manage their operations, compete in the marketplace, supply services, and augment personal lives. These systems can be computerized but information systems have existed before the dawn of modern computers and computer networks. They serve as an information provider for management. This is also true for project management information systems.

A PMIS is a set of, usually computerized, tools, that support scheduling and resources planning, project tracking and control. It is also a system of tools and techniques to ensure the

collection, recording, screening and dissemination of information between the project team, and the information management, which includes modeling, collection, selecting, storing and re-access to information (Rozman & Stare, 2008).

It is not just one piece of software or our own application. It can be a combination of different commercial tools and our own developed modules. The fact that differentiates a group of tools from an actual information system is the ability that applications in a project management information system understand all data in the same way and share it amongst each other. This removes the need for unnecessary data input, whilst if it is needed to copy data from one application to another, there is no true project management information system.

To keep in line with the current way of defining our terms we will take a look at how the PMBOK describes a PMIS. The Project Management Information System (PMIS) is a standardized set of automated tools available within the organization and integrated into a system. The PMIS is used by the project management team to support generation of a project charter, facilitate feedback as the document is refined, control changes to the project charter, and release the approved document.

Additionally the PMIS features should cover all the functional areas described in the PMBOK. The basic ones being managing time, resources and costs. The holy trinity of project management deliverables is therefore the basic needs a PMIS should manage. While the added functionality features include managing scope and planning preliminary needs (these can be the project created products). Managing supply means getting outside sources (contractors) and other things associated with the project (including the information structure). Communication management is another very important need as we pointed out before in the features of project management software. The distribution of information and creation of project intelligence, which offers the involved parties cooperation, maintenance, governance and exchange of knowledge. The management of risk in the information system takes a central role due in multi-project environments. Quality management is another important additional feature with real value for the organization. It includes usage of organizational or industry standards, methodologies, project models, standardized templates, project knowledge and measuring effectiveness of the defined processes for quality assurance, consistency of projects in development and their products. The last but in a multi-project work environment certainly not least important one is project portfolio management, where the success of one project can be heavily impacted by the factors in other projects. Having a view of how these projects interact is of great use to the management of the project and upper management especially.

The qualities that a good PMIS should have lay primarily in the ease of use for a new user, which includes clear and logical commands, helpful documentation, and others. Also important are charts and views of data. These should not only include the Gantt chart but also

other types, such as multi-project views and specialized views for each type of user. Whether it is the top management or the project manager or even the stakeholders, the user should be able to clearly see what's needed, while being able to choose which information to withhold and which to show to outside parties. The plans should also include the data on the earliest possible start date, latest possible finish, planned start date/finish, and of course the actual start and end dates. The measuring unit needs to be flexible, from one minute to one week. The calendars should include work days for each resource specifically and reports should also be individually adjustable. We already spoke about the need of single data entry, but migration of this data is also very important. Being able to export the data to graphical programs, and simple writing tools (like Word) is extremely useful to the users.

### **1.3 PROJECT MANAGEMENT SOFTWARE**

Next we need to add a clear definition of what project management software is. The PMBOK describes project management software (tools) as a class of computer software applications specifically designed to aid the project management team with planning, monitoring, and controlling the project, including: cost estimating, scheduling, communications, collaboration, configuration management, document control, records management, and risk analysis (PMBOK 2004; Project Management Body of Knowledge 3.0).

That's a pretty wide array of software that is being crammed into the specter of our search term. It basically describes that any piece of software that can be used to aid the project management team is classified to be labeled as such software. To distinguish this more clearly I will use a more structured way of describing the different types of software that assist in project management. The different types of features that are commonly found in today's project management software are the following:

- scheduling
- resource management
- collaborative software
- document management
- project portfolio management
- Issue tracking system.

These were used by Nemec-Pečjak in his previously mentioned work for describing the different features a software package can have.

Scheduling is meant to encompass the ability to create the WBS matrix, display Gantt charts and calculate the critical path. Managing your resources, scope, time and budget, the three main restraints in your projects besides the deliverables. It's a feature that is most associated with project management software. Collaborative software is software designed to help people involved in a common task achieve their goals. Document management is not the most common feature in single project management software tools, instead usually being associated

as a component of the enterprise content management system. In big companies it is impossible to not run into the problem of managing multiple projects, which is where project portfolio management systems come in hand. An issue tracking system is mostly associated with bug tracking for software project management and it doesn't see much use in non software related project management.

In addition to features and capabilities, the general-purpose programs may be categorized based on several factors:

- Single or multiuser
- Single or multiproject
- Platform (PC/Mac, file services [redirection], mainframe, client-server, Web based)
- Server operating system (Windows, Unix, Linux, other)
- Data access (file system, ISAM, relational database, other)
- User interface (text, simple GUI, rich GUI, other)
- Import/Export (spreadsheet, XML, etc.)
- Sales/Support (proprietary, open source, shareware, freeware)

The most appropriate software packages for modern IT projects would be Web based, would utilize a comprehensive relational database, are highly scalable, and have a modern GUI while still having the features the users need.

#### **1.4 PROJECT MANAGEMENT 2.0**

Being credited as a yet another buzz word for project management, this idea is catching on as many software vendors are adopting these new techniques into their software programs. This is why I feel it is necessary to include it in our overview.

Social project management or project management 2.0 is PM in the age of web 2.0. Web 2.0 is a term that is commonly associated with web applications that facilitate interactive information sharing, interoperability, user-centered design, and collaboration on the World Wide Web. A 2.0 website allows its users to interact with each other as contributors to the websites content, in contrast to websites where users are limited to the passive viewing of information that is provided to them. Examples of Web 2.0 include web-based communities, hosted services, web applications, social-networking sites, video-sharing sites, wikis, blogs, mashups, and folksonomies. These ideas are pushed mostly by the software providers themselves and a few newer authors in the field. Andrew Filev, the CEO of Wrike, a software package I will present later, is one of those. But there are more, like Daptiv's Chris Lynch who sees the need for project management to keep evolving, with collaboration at the heart.

So from this conclusion follows that PM 2.0 is the natural evolution of project management practices brought by Web 2.0 technologies. With broadband as the new utility, virtual teams

now can work together much more efficiently by utilizing the new-generation, web-based tools. These tools challenge the original definition of project management. Project Management 2.0 represents a dramatic shift toward having collaboration at the heart. A very important factor in the success of the ideology is in its vision for the project manager. Traditional project management is based on the project manager’s control. It places the manager in the center of the project work, as he needs to collect all the information from the team, process it and then communicate to upper management. It can be hard for the manager to bring the project plan to life due to the fact that all the information on the project is concentrated only around a single person, which is the project manager himself.

In traditional PM software the manager’s daily routine involves pulling in information, typically through email and contacting the project team, then updating the plan with these adjustments and notifying the team on changes. He would then have to report to the upper management on delays and deviations from the plan. Followed by reminding those who are not on track to pick up the work and/or make plan-adjustments. This part of the job could be called the project secretary. What PM 2.0 is suggesting is that these tasks should be left to the PM software and that the project manager should rather lead the team and interact more with stakeholders and not do daily chores of updating and bringing the plan to the present day state.

**2 MARKET ANALYSIS**

The project management software market is an abundant market, yet it still only reaches about 5% of the world’s population. In sum that is about 300 million people worldwide. This is in 2010 after decades of being told that most of what people as organizations or groups do are projects. Investments, complex construction, engineering, research and development, organizing events, business process restructuring, mergers and acquisitions, etc. And if companies are making such little use of the teachings then our home projects are surely doomed to not be treated as ones. But it gets worse, even the ones that are users of project management software are not using their applications to its limits. Most are barely scratching the surface of its features.

Table 1: Ten functions that the automated project environment can help...

1. Develop objectives and business needs	6. Optimize resource use across multiple projects
2. Create or modify work breakdown structures	7. Provide Gantt schedules for a tracking baseline
3. Calculate estimates (overall project and activities)	8. Provide integrated, prioritized “to do” lists
4. Record assumptions that affect the estimates	9. Record and report actuals against the plan
5. Perform precedence analysis – crash the model	10. Store and reuse project metrics

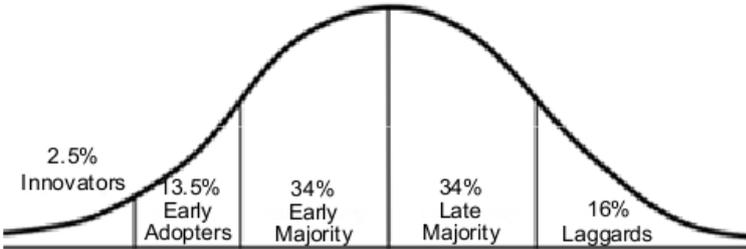
*Source: Visions for the Project Management Software Industry, Stacy A. Goff, 2009.*

The list above shows a list of Ten PM Functions that benefit most from automated support. It is part of a larger list assembled by Stacy A. Goff in 1980 while designing a project

management methodology. That design included the roles of the project manager and key stakeholders, documenting project processes and activities, and citing the extent to which then-current automated support (running mostly on mainframes and minicomputers) helped manage projects. The list is still useful today for evaluating a project management software suite, and for evaluating the extent to which any enterprise or project team is leveraging their software. For example, some project-oriented enterprises use a range of desktop tools, content management systems, and project or portfolio software, together with databases, to implement all the features. Others use only desktop tools, barely covering a couple of items. Their schedules are “good enough to get executive approval” but are seldom used as a baseline for tracking purposes. Software in majority aren't even using the existing technology which in itself poses a great challenge to the project management software industry.

We will analyze this list of functions to suit our needs a bit better. Developing objectives and business needs implies creating task lists and possible milestones that must be reached in order to accomplish the goal. The second is more straightforward since work breakdown structures are universal. Calculating estimates is supposed to be handled by resource management features. Recording assumptions that affect the estimates on the other hand is a bit trickier for project management software. In order to test the model Gantt charts need to be manipulated and critical paths calculated as well as resources tested while producing budget estimates. Optimizing resources across multiple projects is only available in project portfolio management systems. Providing Gantt schedules is on the other hand a feature most commonly associated with project management software. Providing integrated to do lists means to be able to allocate tasks for each individual in the project team within the software, as well as that individual being able to clearly see these tasks. Recording and reporting actuals against the plan requires either real time information or report possibilities that enable data of the current standing of the plan. And lastly storing and reusing metrics is more about project knowledge and how this is handled by the software for future projects.

Figure 1: Ten functions that the automated project environment can help...



Source: M. Rogers Everet , *Diffusions of Innovation*, 1962.

There will always be those who are ahead and those lagging in terms of aptness in use of their tools. Everett M. Rogers summed it up quite adequately in his innovation adoption curve (figure 1). It was defined in his textbook *Diffusions of Innovation*. He defines diffusion as

"the process by which an innovation is communicated through certain channels over time among the members of a social system." The same can be applied to our project management social system, so to speak. Since it takes time between the first adopters who use a technology to when it reaches the mainstream audience.

This standard bell-shaped curve with two standard deviations and a further breakdown on the left identified five groups by their technology adoption patterns: innovators, early adopters, early majority, late majority, and laggards. Using this curve as a guide, it is the innovators and early adopters that we can call leaders, those who have made significant progress against the top PM functions list.

Clearly, project management software vendors must either increase their audience or improve the market penetration of their tools, or both, to realize their potential. What is most important to users though, is to maximize the benefits from proper use of today's tools and then add project management competences to embrace the advancements to come.

## **2.1 SURVEYS ON THE TOPIC**

### **2.1.1 PMI SURVEY**

A thorough survey was conducted in the beginning of '08 on the topic of the project managers perspective on project management software. It was conducted among 500 professional project managers, the majority of whom are affiliated with PMI. The survey utilized a list of 27 different software packages for managing projects from which the respondents identified the package he or she had used the most, the second-most and the third most often. This list represents computer solutions available for commercial purchase (proprietary) or with an open source license (freely available). The solutions were available for either desktop installation or Internet usage.

The survey gathered the perspectives on the software's functionality and its effectiveness. With the goal of looking to the future of the effective utilization of project management software, the researchers questioned the respondents regarding their organizations migration plans and their own sources of information about these software packages. The participants can be described as an experienced crowd with diverse positions held in their respective projects. Their degrees ranged mostly from Bachelor to Master with some undergraduate and Doctors degrees. The organizations that they worked for were also quite diverse and they were mostly managed by projects. Yet they all noticed a very low utilization of PM offices. But what is even more striking is that only 14% had a degree in project management, even if it was mostly a Project Management Professional degree. This is a low percentage of certification in project management among a group of professional project managers.

Coming to the PM software used, almost all had used at least one software package. A third have used a second one and only the rarest have had experience with a third software package. The most used package is as expected MS project, used by 441 of the 500 participants. Of them 42,6% had a positive impression of the software and 50,2% had a neutral view of it. The remaining 6,8% had a negative impression and 0,4% are undecided.

What most value in their software packages, based on the functionality and its effectiveness, is the ability to plan and sequence activities using CPM/PDM/PERT or Gantt chart methods. Followed by being able to produce project master schedules based on project/worth breakdown structures with subordinate detailed schedules. Also important are scheduling statuses and forecasts based on progress to date with a controllable baseline and of course the critical path calculation. Least valued are performance measurement, including earned value, cost forecasting and variance analysis (schedule & cost). When it comes to ease of use of the software package, the most crucial thing was ease of use for the project manager and his support personnel. Least important was the ease of use of the project sponsors and other team members.

Just judging these preferences reveals a whole set of problems. Obviously “crash the model” type approach is being totally ignored in the software packages by the surveyed crowd, as well as risk analysis, while it is most important to be able to produce baseline schedules that can get approval. But later when managing those it’s not important for the package to be easy to use for the stakeholders, as they will obviously wait for their reports. Resource allocation is just a mere average on the importance list.

While these problems already are a handful the following evaluations of their most used package based on the same questions are even more troubling. It only barely fulfilled the expectations in the most important categories of functionality, while failing at the least important as well as with resource allocation and budget management with baseline control. On the topic of ease of use it lived up to only the project managers’ personal view. It failed in ease of use by other stakeholders and reporting on programs and multi-project management as well as the ease of integration with other communication tools. Already mentioned was the fact that very few had used a second package but those that did were positively impressed by it in comparison with the first software package. The third most used received an even worse grade.

The last part of the survey digs deep for the reasons of this unhappiness with project management software packages. Among the surveyed 79% believe that they could benefit from more training which isn't really surprising, as before mentioned, only 14% have a degree in project management, so it is questionable how many have had training in the use of the software they worked with. Also almost two thirds believe that the marketing of the software sets the expectations inappropriately in the first place. Yet 73,5% believe that there are

software packages more effective than the ones they use. This estimate is based again on product marketing, the view of coworkers, colleagues and product reviews/case studies. Even more tragic is the acknowledgement that only about 40% believe that their organizations effectively utilize their selected software packages, while a mere 16,7% are planning to change their respective software. This depicts the usage from the project managers' perspective as rather poor and discouraging. Hopefully they will implement training and enable better policies, responsibilities, processes and through that maybe fix their usage of the already available technology.

### **2.1.2 SLOVENIAN SURVEY**

A similar survey was conducted in Slovenia in 2004. Since it has been over 6 years, I will examine the findings of the survey very critically. But nevertheless it is interesting enough to include the analysis. It was successfully conducted among 49 organizations. Those surveyed represented mostly large organizations (45%) with one third having in between 101 – 500 employees. The remaining 20 percent were fit into the category of less than 100 employees. Almost all of them were/are private owned companies of different legal structures with a few nonprofit and government organizations in as well. Projects done in a year ranged anywhere from 6 to well over 50 in most cases, while 12,3% recorded only up to 5 projects per year. Among these projects the most common ones are investment projects (63,3%), as well as R&D on new products (51%) being put on the market as well as R&D for new services (38,8%). Added to that were information restructuring projects (61,2%) in the organization itself. Whereas human resource management projects were on the lower end of the spectrum. Staffing project were executed in 6,1% cases of projects yearly, and only 18,4% have had educational projects.

Almost sixty percent of the surveyed (57,1%) believed their organizations were adapted to project work, while only 14 of the 49 have had matrix style organizations and even fewer (7) had a project-oriented organization. The level of PM knowledge was mostly graded as average while only one third deemed their knowledge as of higher level. Positively surprising is that more than three quarters (77,5%) of the surveyed have had additional training in PM. On the topic of project management software usage there we see that only 57,1% had used it, while those who hadn't fell back to their trusted office applications (Excel, Word), emails, reports, intranet solutions and others. Those who did mostly knew and used MS Project (69,4%), followed only by Primavera (4,1%). What must be pointed out is that the questionnaire was asking which PM information systems the respondents use and nor MS Project nor Primavera count as such. From those who used MS project only two had it set up as an information system. This is a detrimental statement to the use and view of project management software. On the frequency of use only half used their software regularly and the other half either occasionally (36,7%) or never (12,3%). Still more than half felt that the rate of use had increased in the previous five years. For the reasons of non use they ranged

anywhere from uneducated staff in the use of the software, to resistance to use more software tools, high price of the software packages and too low support from upper management for its use.

This leads us to believe that most organizations in the Slovenian market knew of at least MS Project, and could have been considered as avid users. But also most of them did not know that it is not a project management information system, but merely a software package that needs further investment to be integrated into an information system. The question on the usage of the software tools at hand is whether the software was truly lagging or the users just did not care for it or even understand its meaning in the organization. And on the topic of training it was formidable that more than three quarters had training in PM, yet how many have had training in the software their organizations possessed. The fact that the survey is from 2004 and that the software changes dramatically in such a period of time leads us to only view the reviewed as an interesting piece of information and not as a rule. But given how slowly organizations change it is still useful knowing the state of project management software at that moment in time.

## **2.2 MICROSOFT PROJECT**

As we were able to conclude from the surveys the most prominent example of project management software is Microsoft Project, the current being the newly released 2010 version. It is a project management software program developed and sold by Microsoft which is designed to assist project managers in developing plans, assigning resources to tasks, tracking progress, managing budgets and analyzing workloads. It is a desktop based solution, available only for the windows platform. Desktop applications typically store their data in a file, the proprietary format .mpp being the file format of choice in MS Project. This is important for those who wish to use a different package but still collaborate, with stakeholders and outside parties who use MS Project. Collaboration in such is very hard and Microsoft was quick to realize this. As early as 2000 they released their first Microsoft Office Project Server (also newly released in its 2010 version). This allows the user to access the shared files on a server (calendars, time sheets, as well as documents, provided the user has a share points server) while keeping any changes to the main file visible to any of the participants. It also allows for access through the web interface as well as the MS Project desktop application itself.

From this arise all sorts of advantages and disadvantages (true for any online solution):

- Can be accessed from any type of computer without installing software on a user's computer
- Ease of access-control
- Naturally multi-user
- Only one software version and installation to maintain
- Centralized data repository

- Typically slower to respond than desktop applications
- Project information not available when the user (or server) is offline
- Some solutions allow the user to go offline with a copy of the data.

MS Project is filled with features, but these come at a price and the price is 999,95\$ for a new license, or 599,95\$ for an upgrade (the professional edition, while the standard edition is 599,95\$ and 349,95\$ respectively). Why is this important? Well since you also need to spend on the server offering in order to enable efficient collaboration, this sums up to a fairly high priced, high value buy. Add to this that u need an IT staff to manage your server base and its updates, as well as the regular cycle of new releases that Microsoft's offering goes through (2003, 2007, 2010) and its understandable that companies are always looking for alternatives. The other common solution in the market is Oracle's Primavera, which is equally priced or even more, depending on the integration with the companies information system. Some might argue that these prices are acceptable in the eyes of users, and point out the success of the two in adoption and usage, as well as the sheer amount of available training, courses and seminars. That is true for bigger companies, or better said for companies that can afford a big IT budget, but with the recent impacts of the economy on the budgets of organizations we can see that's not the case for many. This leaves small and even some medium sized businesses (SMB's from now) facing a challenge on how to support their projects, as well as any company looking at alternatives. And what if I as a company don't need all the complex features that MS Project has to offer? I aim to give an answer to this and some other questions in the following.

### **3 ANALYZED SOFTWARE**

A vast amount of project management software is available today in a wide variety of capabilities, applicability, platform requirements, and prices. These software products significantly enhance the project managers job of managing a project in almost all aspects, including selection, planning, scheduling, execution, control, risk, and communications. Project managers should therefore be aware of the types of tools available and the features and applicability of those tools. In this part, types of software products and some specific products are identified and discussed.

There are many general-purpose project management software systems that handle project scheduling and progress reporting. Some of these systems may also include capabilities for some other aspects of project management, including risk. Many project management software systems also handle very specific aspects of project management, such as estimation, risk, change management, portfolio management, earned value, and so forth. There is a need though that software packages become more approachable, with their ease of use and ultimately including only the features users want. It also needs to become more flexible to provide different users with different views on the project, in order to distinguish the function

of the project leader and the team member. Project management has always tried to enlarge its scope of potential practitioners, and new applications are making these advances possible. One of the ways is to make the software more social. This is where our described project management 2.0 comes in. We will look at these new waves in software packages and more.

But let us first look at one of the main reasons of what needs to change in the market and that is its price tag. The market of project management software existed ever since the rise of the microcomputer and its project management tools. Microcomputers began to arrive in the enterprise by the late 1970s but did not produce notable benefits at first. When the Apple Lisa computer came out in 1983, it included an innovative project management software package. For those who did not have access to mainframes or minicomputers with powerful workstations and high-end project management software, it was the first time they could “crash the model”, perform precedence analysis and see the cost and schedule impacts, in real time. This was an era of massive platform change, as mainframe and mini-computer applications jumped from their format to this emerging new microcomputer platform. Joel Koppelman saw the opportunities of the personal computer (PC) platform, and co-founded a new company, Primavera, to develop for that platform. He emphasized combining processing power with ease of use. Existing industry standard tools (at least in oil, aerospace and construction) such as Artemis also migrated to the new PC. New applications caught on, including SuperProject, Timeline, Harvard Project Manager, and others at the midrange. At the low end, there emerged MacProject and others. The market was booming and broadening at the same time. This broadening aspect, with project management software reaching many more people, was a key outcome of the microcomputer revolution, benefiting from the ubiquity of the personal computer: You could manage your project on your desktop, or on the road (Stacy Goff, 2009).

So Gantt charts and other tools have been around since forever, but yet we still keep on paying a couple hundred dollars every few years, for a list of new features that had been put into the new model. But as with any industry of computing these incremental changes can only demand so much from customers until a disruptive change comes in. In this case it is no different than Office suites that have been around since the 90's. The market leader in Office suites being again Microsoft. They too are upgraded every few years and have more and new advanced features and demand more money each time, but a disruption occurred in their market. Users wanted alternatives, alternative pricing, and interestingly not more features but simpler tools. They just wanted a tool for writing their documents, making presentations, or using their spreadsheets. So new applications came up that meet their demands. Desktop office suites like OpenOffice, IBM Lotus Symphony or even the Mac bundled iWork. Additionally online office suites, from Google, Zoho and now even from Microsoft's have sprung up to meet the demand. The value of the market leader is being eroded every time a new office suite comes out. Similarly I expect the project management software market to evolve.

### 3.1 OPEN SOURCE TOOLS

What will cater to most users are free project management applications, many of them being open source software. Being there is still much fear, uncertainty and doubt about open source in the enterprise I want to take a moment to reject those and project a clearer image of it as well as show some examples of it in the business as well as personal domain.

The open source model of software distribution and usage is vastly different from commercial products. Open Source software is copyrighted but freely released; extensions and improvements are freely released also. There are a number of free license types, the most popular is the general public license (GNU), with increasing popularity in the Apache web license used by the ever growing web companies like Google, Facebook, Twitter, etc. Open Source software is free to run, copy, distribute, modify, extend, and improve. While it may not have a single product provider, it may be developed by an individual, group, or organization and then extended by a “community” of cooperative groups of individuals, each of whom contributes parts of the product. Documentation, support, training, and consulting is generally not centrally available but provided by the community (most documentation today is online). Some products have sponsor organizations that become focal points for the coordination of official releases of the products and the documentation thereof. Sponsor organizations raise funds for their activities via sale of priority support, installation and integration services, other consulting, and/or related products. Sponsor organizations who are also the copyright holder may also release versions of the product under multiple open source type contracts or under proprietary contracts. Implementing an Open Source solution requires a different approach from the buyer’s perspective. There is no salesperson, no license agreements to sign, and no serial numbers to record. Initial and ongoing license cost savings in using open source software can be huge. Organizations pay significant amounts for annual software license fees. It used to be that free open source software meant “buggy and without support”. The source code itself was the first line of support. However, many organizations are now taking a second look at open source (Dan Brandon, 2006)

Just compare the success of the most prominent examples of open source software. Firstly there is Linux which powers so many servers as well as consumer products nowadays with Android. To this we can also add the soon to be coming out Chrome OS, a netbook operating system based on Linux by Google. There is also mySQL, the relational database of choice for most websites, the Apache web server and of course all those programming languages and integrated development environments, etc. Those are all relatively unknown to the public but there are pieces of open source software that almost all of us know. OpenOffice as mentioned earlier is one of them, as is Firefox the web browser, maybe the most prominent example of open source software for end users to date.

But it doesn't stop here, we already mentioned Google, Facebook and Twitter being prominent users of open source in their respective businesses. A new study from Forrester shows that when it comes to Enterprises IT Open Source has crossed the Chasm from the early market users to the mainstream market. What is even more interesting is that even Microsoft now has its own open source project hosting web site called Code Plex. Clearly there is no distinction between proprietary and open source projects from, there is just a distinction between good and bad software.

But what about project management software? In the project management software market, this includes open-source versions of Project Workbench, one of the most popular project management software tools from the 1980s, and clones of today's most popular project management software. The open source movement provides an alternative that markedly reduces the total cost of ownership for project management software. It also gives commercial software an incentive to keep innovating and to improve its value proposition to customers. Longer term, the open source movement grows the market significantly because those who use the free versions eventually outgrow them and trade up to commercial tools or find certified support for their products, like the Red Hat Linux model.

Project management applications are usually centered on Gantt charts, where each step in a project is represented as a bar in the chart. These visuals are linked to lists of the resources tied to each task (such as the person, team, company or another entity responsible for doing any given job). Everything is synchronized to a calendar, which updates you on the progress that your project should have achieved at any given time during its life cycle. These are all true for the open source project management software packages that we will describe now.

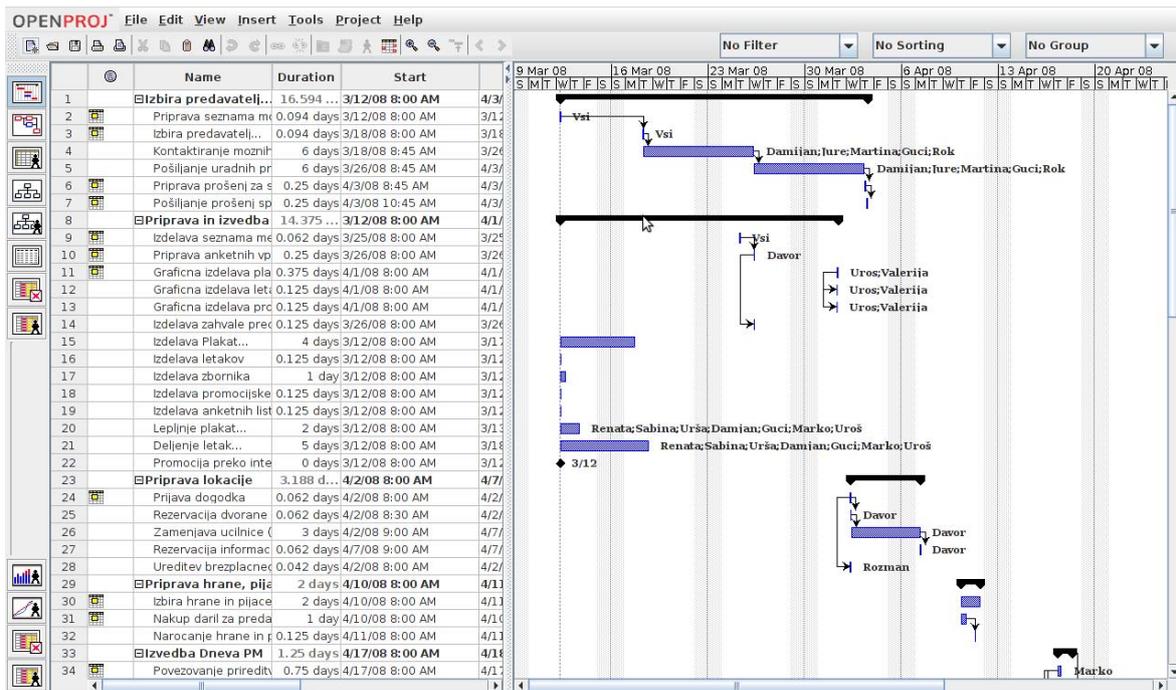
### **3.1.1 OPEN PROJ**

OpenProj is an open-source software tool for projects, and has the potential to be the most popular among the project management software, mainly because of its compatibility with Microsoft Office Project files, while it works well on its own for building project plans. Serena Software can offer this application free of charge because makes its money by selling back-end, server-side features to go with OpenProj for business clientele needing multi-projecting, reporting, time sheets, notifications and other enterprise-level applications. According to the Web site, OpenProj has been downloaded over 1,250,000 times. It comes as a desktop program in versions for Windows, Mac OS X and Linux.

The first thing to notice is its extensive charting features. OpenProj features Gantt and PERT charts, and also incorporates WBS, RBS, Earned Value costing, and a few other charting methods. The tasks and resources in the PERT, Work Breakdown Structure (WBS) or Risk Breakdown Structure (RBS) charts of OpenProj are manipulated by simply dragging and dropping boxes; the pathways among them then reroute automatically. In its default settings, it

labels its task bars with the name of the corresponding resource. You can also click on a bar and drag it side-to-side along the time line to place it earlier or later in the schedule, as well as adjust the sides of the bar to shrink or stretch the time duration of the task. OpenProj lets you assign tasks with work times that run for less than one hour -- down to one minute. This is a particularly useful feature to have. As for the default view of the application, we can see below that it is familiar to the view of MS Project.

Figure 2: OpenProj



Source: Own screenshot of OpenProj application, 2010.

A last big plus for OpenProj is that it successfully opens every plan file saved in the Microsoft Office Project format. The other project management applications on this list usually had problems importing Office Project files, if they had the ability to do so directly at all (without the need to first export the file to XML).

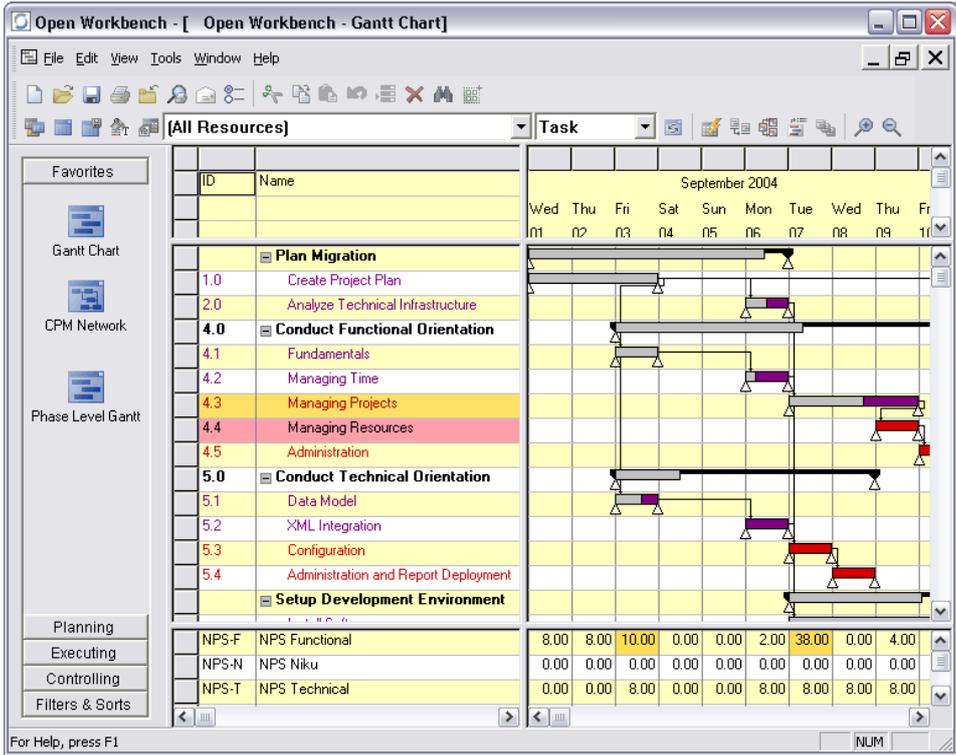
### 3.1.2 OPEN WORKBENCH

As its name implies, Open Workbench is yet another open-source project management program. It runs only on a Windows computer with the Java Virtual Machine Runtime installed. The company backing Open Workbench sells online training for \$150 to get you up and running. Otherwise, this application is free to use, although you have to go through the minor hassle of registering for a user account at the Open Workbench Web site.

Open Workbench cannot open files saved in any of the Microsoft Office Project file formats. It accepts only XML files and its own proprietary file format. Fortunately, Open Workbench

managed to import all of the XML files created by Office Project that I tried in it. In its default settings, Open Workbench renders your project plan as a basic Gantt chart, with no labels on the task bars. Like OpenProj, you can adjust the duration or position on the schedule of a bar by simply clicking and dragging it. But also like OpenProj, clicking a bar in the Gantt chart doesn't highlight the corresponding task or resource name in the task or resource list. Its main display (under the Gantt chart screen) is split into six sections, which show the chart, task list, duration of tasks, calendar, resources, and the scheduled availability of your resources. All of these sections will resize respective to one another when you click and drag their borders. This is one of the stronger aspects of Open Workbench compared with the other project managers covered here, mainly because you can see most of the data tied to your plan without needing to click away from the main Gantt chart. This helps to give you the "whole picture" of your plan while you're either building or reviewing it. Open Workbench also generates a Critical Path Method (CPM) network flowchart from your plan, although you cannot manipulate it by dragging and dropping the task chart boxes. You can only alter the pathway links among each task.

Figure 3: OpenWorkbench



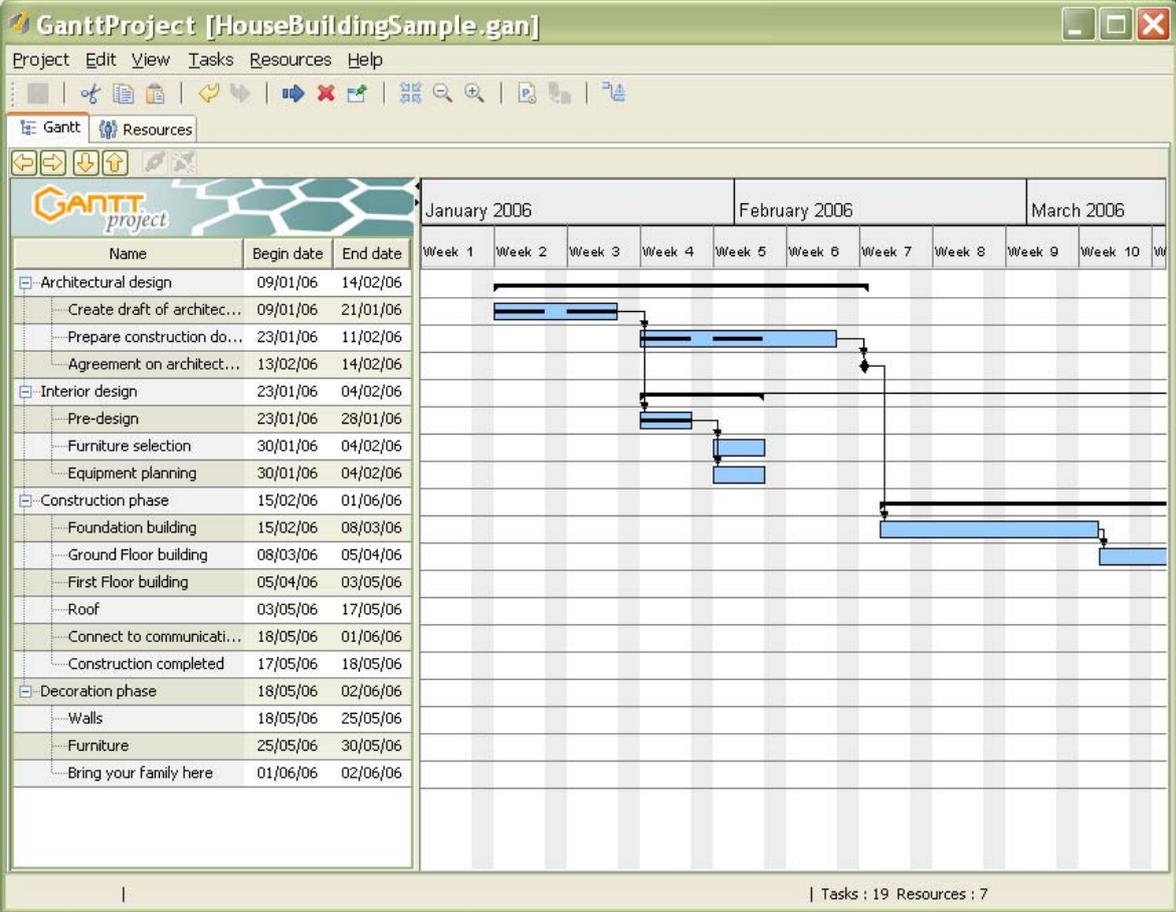
Source: OpenWorkbench Website, 2010.

Open Workbench is available for the Windows desktop, while it is possible to run in Linux as well with a few workarounds and additional software.

**3.1.3 GANTTPROJECT**

GanttProject is an open-source application written in Java. It runs on Windows, Mac OS X or Linux, as long as the Java Virtual Machine runtime is installed on your computer. It can be launched directly from the GanttProject site; or you can download the installation file for your specific operating system and install the Java code to run as a standalone desktop program.

Figure 4:GanttProject



Source: GanttProject website [http, 2010](http://www.ganttproject.com/).

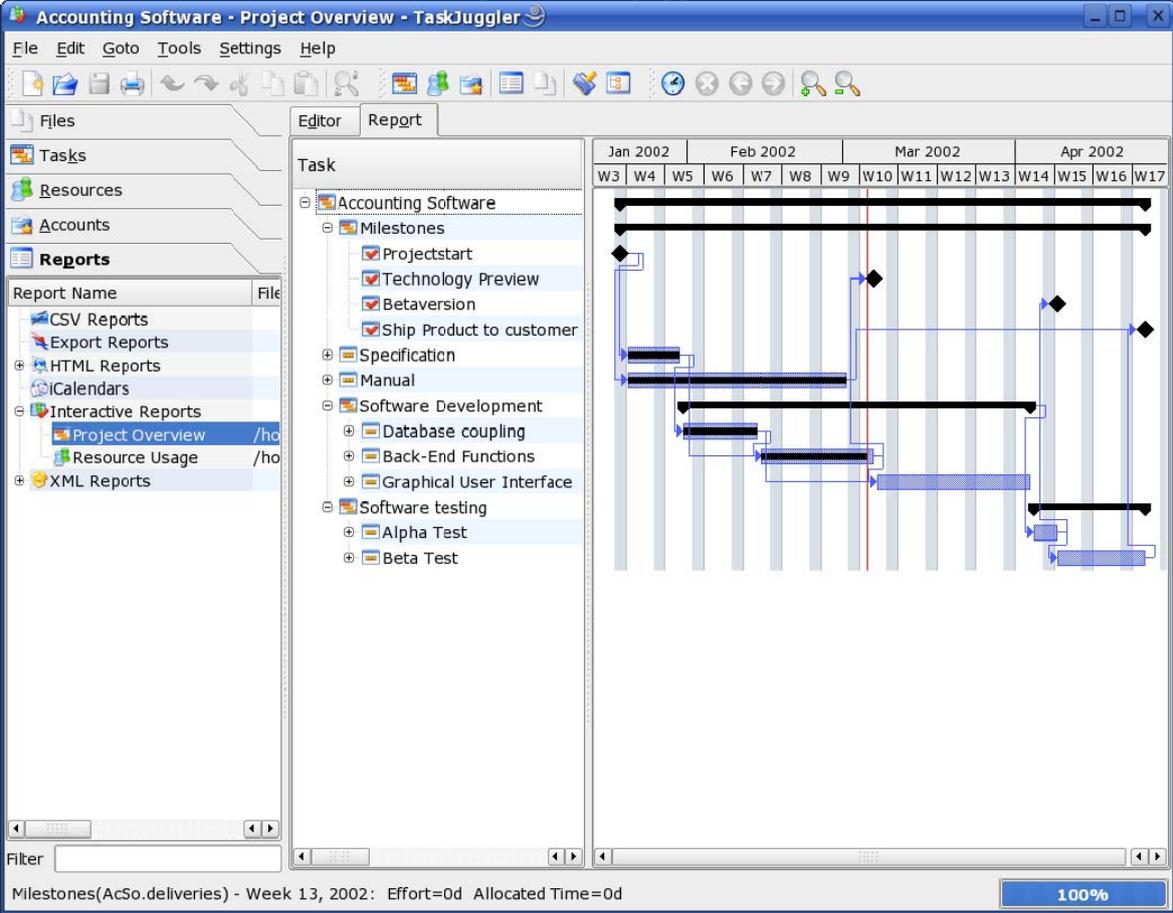
GanttProject has a number of features that set it off from other applications. GanttProject lets you use whatever color you like for your bars, and also apply textures to each of them. Calendars can be customized by setting what days count as non-working days. GanttProject though lacks the ability to break plans down to an hourly schedule. It can only be used to create plans that run on a daily schedule. GanttProject lets you print your plan charts to paper. It even features a very capable print preview tool. With it, you can perform tasks such as adjusting the width of your chart and clicking through different page sizes to ensure that your plan will be big, and legible, enough to read as a hard copy.

Native Microsoft Project files can be imported into GanttProject, at least in theory. In practice, a couple of test files in Microsoft's .mpp format I tried failed to import correctly or could not be imported at all. GanttProject loads and saves files in its own proprietary format, along with importing and exporting files as XML. It can also export plans to spreadsheet format in CSV

format ("comma-separated values"). One thing that sets it apart from other free applications is that GanttProject can create PERT charts, where the tasks in your plan are depicted as a series of interconnected boxes. You can drag and re-position the boxes to other areas on the timeline, and the pathway lines between it and other task boxes will adjust accordingly. This works well as a quick and easy way to fiddle around with your plan.

### 3.1.4 TASKJUGGLER

Figure 5: Taskjuggler



Source: Taskjuggler website, 2010.

Taskjuggler is a text based system, you input a simple text file, that you can make in a notepad and Taskjuggler will return you a report full of the statistics and data you'll need. It does have some issues however, the largest being that it is a static state system, and as such it is hard to update any changes halfway through. Taskjuggler comes with all the standard features of most project management tools, including time lines, charts, resource management and contact lists. But it also has more than just that, it has some very useful features such as their "Resource Conflict Solver" which stops double bookings taking place, and you can also assign running costs to a resource, which is not common for the other tools analyzed. It also has project tracking support, enabling clients to find out how far along you are, as well as allowing multiple time zone planning, great for those companies that outsource their work to

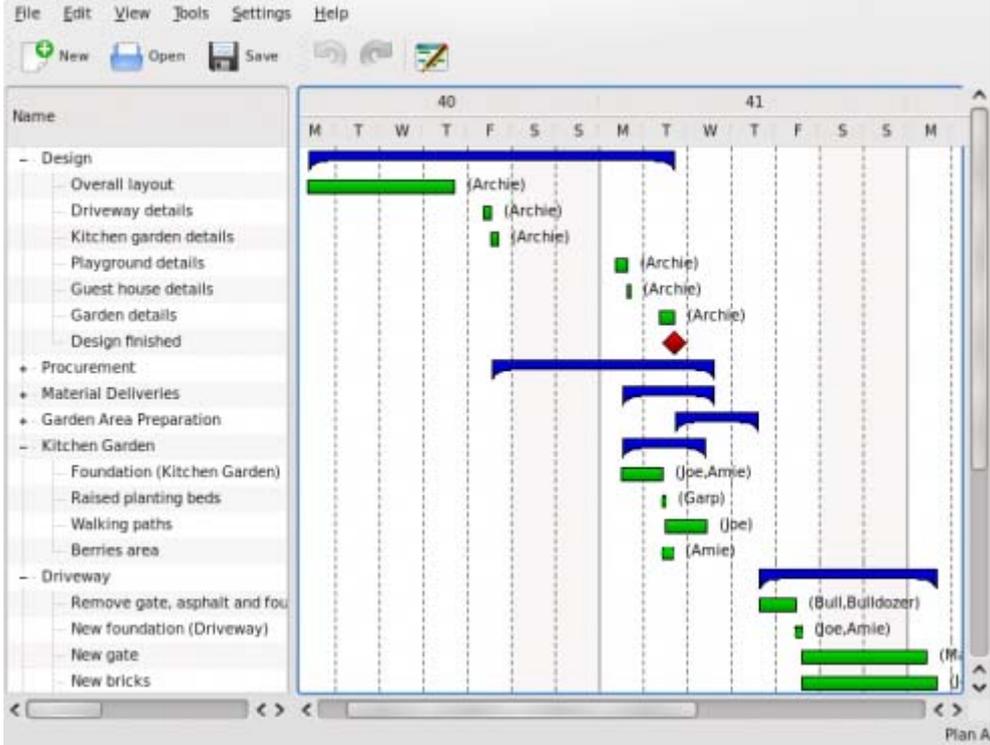
other countries. The TaskJuggler design frees the project manager to focus on information that is known about the project at any stage of the project. TaskJuggler then turns this information into meaningful reports and charts. It supports the project manager in all phases of a project, from the initial idea, to effort estimation, budgeting and status tracking.

The textual project description sets TaskJuggler apart from other project management programs. It allows the user to focus on the work breakdown structure, task priorities and dependencies, the given resources and their availability. Based on the provided constraints TaskJuggler computes a schedule for the given task items. The built-in load balancer honors working hours and levels resource usage automatically. TaskJuggler computes task intervals, allocation times for every resource, and a profit/loss analysis for the project. These results can then be turned in a large number of reports by using a filtering mechanism that can be used to restrict the information to the subset to be presented.

The default view is, like with the other packages very familiar to the one MS Project has, the greatest distinction to it being the necessary text input, which is not suited for your typical project manager and is better used in software development. Developers would also be the ones more capable in using this type of text based input. Taskjuggler is developed for Linux and Unix systems, while ports to Windows and Mac OS already exist. Since I only tried the Linux version of it I cannot note how well or if even works on a Windows desktop, though it is noted that these ports are not ready for use of the mainstream audience.

**3.1.5 KPLATO**

Figure 6: Kplato



Source: Kplato website, 2010.

The interface and the menus will be familiar to any user who has worked with project management software, as it resembles MS Project so much. The software is included in the Koffice office suite and is a clone of MS Project. It does not read the .mpp proprietary file format but does resemble the software in the way it looks and works. The interface is consistent and the functions are accessible with one click. You can see your project's structure, timeline, breakdowns in accounts, task and resources, summary tasks, milestones, critical paths, different types of calendars and different scheduling of constraints. The Gantt chart view is of course available and is the default view. It needs to be mentioned that you can keep track of the accounts within KPlato. You can plan your costs taking payments dates and length into consideration.

Kplato is also a Linux only application and is part of the KDE desktop and it's KDE Software Compilation. There are efforts to port the whole compilation to Windows, none of which are notably successful for now. Of all the open source project management software packages Kplato is probably the least favorable to use as it is a Linux only application, with no particular features of its own.

### **3.2 SOFTWARE AS A SERVICE (SaaS)**

As businesses tighten their belts in response to the recession, they're turning to project and portfolio management software to help them identify which IT projects are mission critical and to help them execute those projects as efficiently as possible. Increasingly, they're opting for software as a service (SaaS) versions of project management and portfolio management solutions because software as a service is cheaper and easier to deploy than traditional on premise software, according to tech industry analysts and customers who've gone to use On Demand software. SaaS is also known as hosted or on demand offerings.

On the technical side, software as a service, delivery models are making project management software more accessible to more organizations, particularly smaller ones. What's more, the growth of Web-based social media, from Facebook to Twitter, has put a focus on making project management software more collaborative, flexible and user-friendly. Today's project management software accelerates communication across the hall or across great distances and improves business results.

Software as a service is software that is deployed over the internet and/or is deployed to run behind a firewall in your local area network or personal computer. With SaaS, a provider licenses an application to customers as a service on demand, through a subscription or a "pay-as-you-go" model. SaaS was initially widely deployed for sales force automation and Customer Relationship Management (CRM). Now, it has become commonplace for many businesses tasks, including computerized billing, invoicing, human resource management, and service desk management.

There are currently a large number of powerful, commercially available, Web-enabled project management software systems that offer advantages to the project planning and control arena. These systems enable improved collaboration and communication for project teams no matter where the members are located geographically, with everyone working from the same currently updated information. It provides risk and issue tracking and escalation processes, while also empowering staff and project team members through access to central information repositories, with suitable controls on who can change the information. Automating much if not most of the project management process and related documentation and record keeping. Enabling key resource assignments within and between projects, programs, and project portfolios, and facilitate corporate resource planning and acquisition. And enabling tracking and evaluation of changes in project scope, schedule, cost and risk. They also allow integration of project management processes with all other business systems. And lastly they capture the “lessons learned” on every project for incorporation into the project management process and related data repositories.

A Web-enabled project management system must be selected and implemented at the highest level. As such, the selection and implementation of such systems is in itself a complex management project. The proponents of SaaS describe the following as benefits of such a system to save money by not having to purchase servers or other software to support use, focus budgets on competitive advantage rather than infrastructure and monthly obligations rather than up front capital costs. It also reduces the need to predict scale of demand and infrastructure investment up front as available capacity matches demand while allowing for efficiency flexibility and scalability.

A disadvantage that needs to be mentioned is the fact that the data is in the cloud. The cloud being the term used to describe where these on demand offerings store their data in. This data that is stored in the cloud is effectively locked by the vendor. This data is not interoperable. You cannot easily migrate your data from one provider to another. Since this matter is so important there is also a cloud computing interoperability forum (<http://www.cloudforum.org/>) on the matter. They want to advance interoperability in the market and keep customers from being locked in by the service providers. But being that the solution to these problems is far too valuable to be decided unanimously there is little evidence till now that this interoperability will happen any time soon.

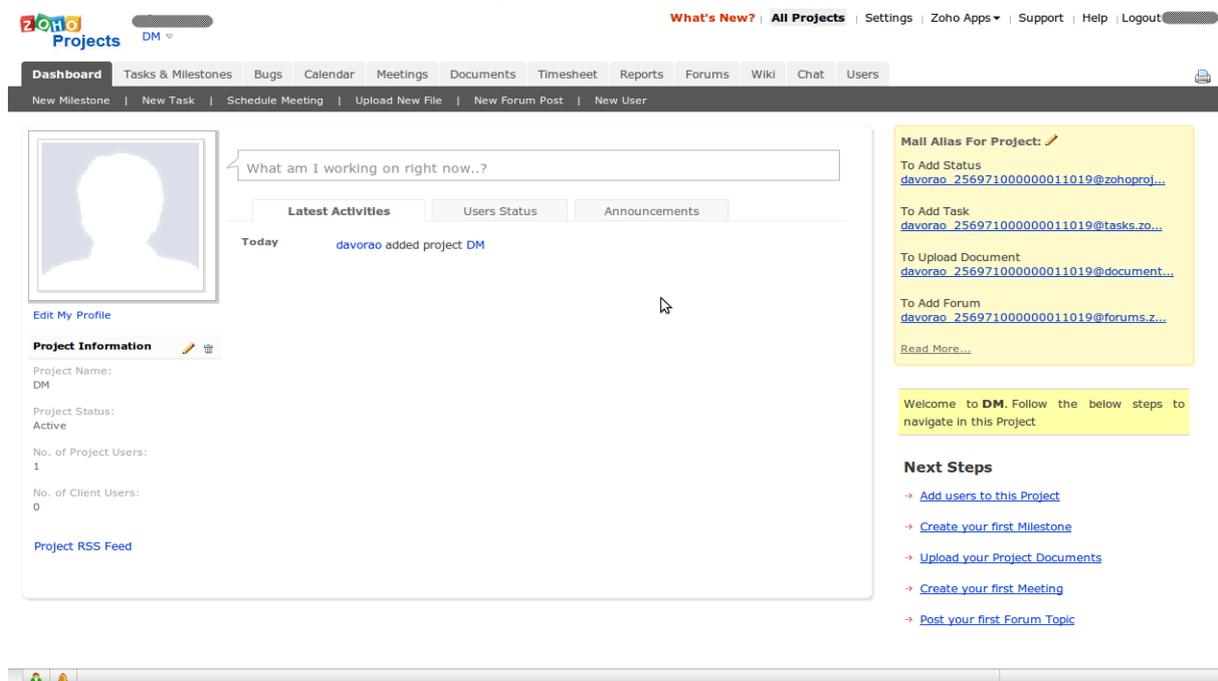
### **3.2.1 ZOHOO PROJECTS**

Zoho is a relatively new player in offering online applications. However, they offer a comprehensive suite of web-based applications for anything from word-processing, power point creating to project management, web conferencing and invoicing. Registration is free, and you can use your existing Google, Google Apps, Facebook or Yahoo! account to register as well.

It supports creating tasks, assigning ownership, setting deadlines and tracking milestones while also working with calendars, Gantt charts, reports, sharing supporting files. The free version of the software accommodates only a single project, whereas in the paid versions you get greater capacities and functionality.

The interface for a project is rich and simple to use. It provides easy access to a diverse set of tools related to project management and collaboration. Each user has their own dashboard and can upload some details about themselves to their personal profile. They also have a status update field much like Facebook and Twitter that lets them update others in the project about what they are doing in less than 140 characters. The dashboard displays all project members updates and latest activities whilst also providing access to an RSS feed to receive these updates in an external RSS reader. See the dashboard below.

Figure 7: Zoho Projects



Source: Zoho Projects website, 2010.

As you can see Zoho Projects offers the following sections; Tasks and Milestones, Bugs, Calendar, Meetings, Documents, Timesheet, Report, Forums, Wiki, Chat and Users.

In the Tasks and Milestones section you can create Milestones. Under each Milestone you can post several task lists which each contain a number of tasks. Each of these can be allocated to a project member and assigned dates to be completed. In addition, tasks can be given dependencies so that one must be completed before the other. The milestones are then reflected on the calendar showing when it is due. The dashboard updates section highlights new tasks and they are also feed into the RSS feed.

The meetings section lets users arrange meetings. The meetings have a time and date associated with them and can be allocated to specific users in the project. Notes can also be attached to the meeting for further detail. The calendar displays upcoming meetings and status and RSS feeds are updated with new meetings.

The reports section presents the user with a number of charts and such to document current task lists and milestones. These can be separated into each user and presented as bar graphs, Gantt charts and so on. The forum section is just like any other standard forum platform allowing forum posts and users to reply to posts. The wiki section allows users to create pages and edit them like any wiki platform. Nevertheless, the Zoho Wiki has powerful word processing tools available from the custom GUI at the top of the editing pane. This allows for complete manipulation of the wiki content. RSS feeds are available for all pages so users can subscribe and receive updates. Comments can also be posted on individual wiki pages for feedback and collaboration amongst workers.

Chat enables users to communicate via an Instant Messaging service. It is similar to a group chat in any messenger service such as Windows Live Messenger. You can also send files to other people in the chat. This section is for managing the users associated with the project. Users can include employees, contractors and even the clients. This is an easy way for viewing fellow employee profiles and communicating directly with them. Having clients as users is useful for gaining feedback from them by communicate directly to better understand their needs.

Pricing is very flexible and is also free for one project with an unlimited number of users. The pay for packages is differentiated by the availability of time tracking, bug tracking and if the wikis and chats are freely included in the price. The prices for these are 99\$ per year, 199\$ per year and 699\$ per year, and include storage of 3GB, 15 GB, and 30GB. All of them have an unlimited number of users and projects. Nevertheless all of them have the ability to share documents, integrate with Google Apps, and even import MS Project and Basecamp projects.

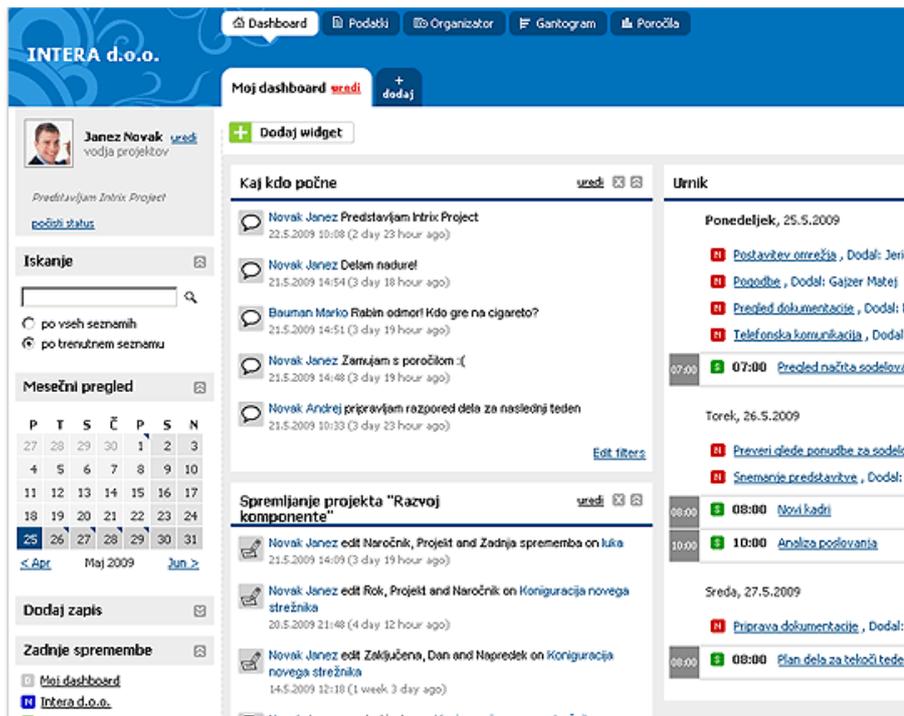
### **3.2.2 INTRIX PROJECT**

It is a simple web application that easily helps you manage projects, control costs and track expenditures of time and money. Intrix Project is used as a tool for project management in construction, architecture bureaus, advertising and marketing agencies, municipalities, IT departments, translation agencies and other companies, which are in any way related to projects or are project-organized.

The company Intera hails from Slovenia and it has produced two web-based applications that are complementary. One is the already introduced Intera Project and the other Intrix CRM. These will let you take care of any project within your company and handle the relationships

with your customers respectively.

Figure 8: Intrix Project



Source: Intrix Project website., 2010.

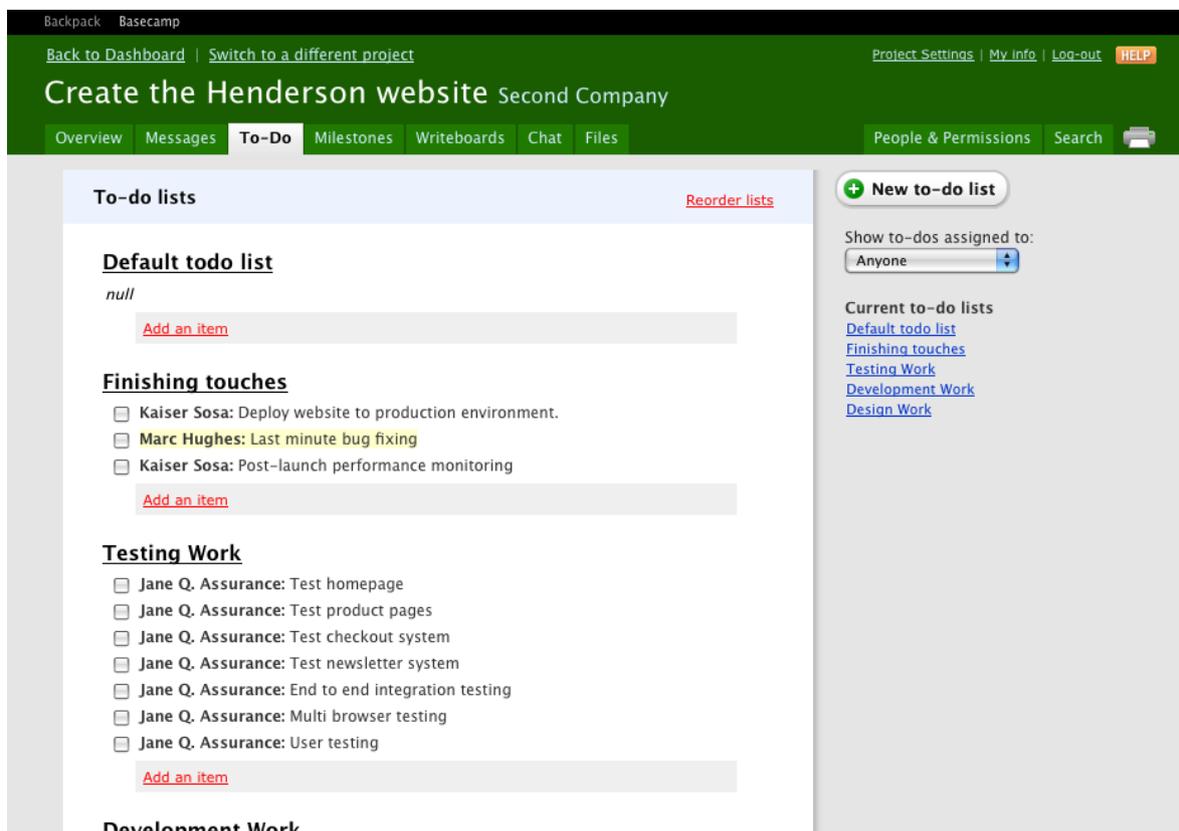
The key features of Intrix Project are in its simple and efficient project planning, managing and archiving of projects. The ability to overview all the data and activities connected to the project in one place. Transparent and clear task lists with deadlines and human resources that are responsible for these. Automatic notifications of deadlines, derogations and changes of the project are key to the clarity of the projects workspaces. At Intrix they are aware of the need to work along existing solutions in the organization and that is why they offer the possibility of an automatic connection with other calendars such as Outlook and Google Calendar, as well as a Synchronization module that enables connection to your existing accounting program (ERP) and other programs. What is visually pleasing is that many of these settings enable you to choose the color, the shape and the number of records viewed by the user. Also special adjustments for filters, shortcuts, and other user settings allow users to work in a simpler manner. They offer multilingual support (English, German, Croatian, Serbian, and Bulgarian) for the product as they strive for markets outside of Slovenia as well. Intrix Project seems also more collaboration software than classical project management software. The pricing on the product is per user and amounts to 21€ per month per said user. But one can get a free trial for the time of 30 days before choosing the software package.

### 3.2.3 BASECAMP

Basecamp is an online project collaboration system. It helps you manage projects and organize your documents in one place and share it across teams. They have three other major applications that complement with it: Highrise (CRM), Backpack (business organizer), and Campfire (chat).

Some people regard Basecamp as the original web-based project manager, since it has inspired so many similar products, and has helped launch a thousand interface look-alikes. Basecamp continues to have a loyal following, offering basic project management as part of the 37 Signals productivity suite. Its “web 2.0” methodologies allow everyone working on a project, not just a project manager, to contribute notes and files to a central location, and to collaborate on project deliverables and due dates.

Figure 9: Basecamp



Source: Basecamp website, 2010.

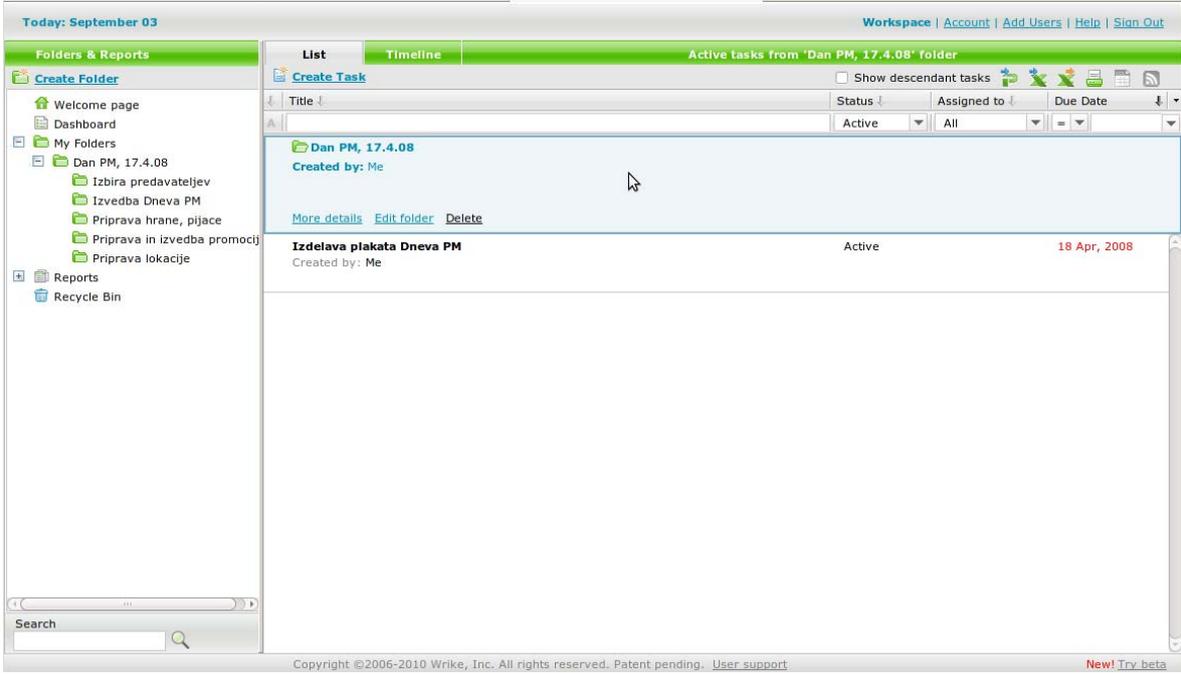
This service let you allocate tasks to team members and monitor their progress using project milestones. Basecamp is more of a collaboration service than a true project manager. It has been criticized for its lack of Gantt charts, but from my perspective that maybe just a fresh way of looking at things. The dashboard overview lets you create a new message, a new task, or a new milestone in one click. They make it easy for many people to collaborate. I like that

you can private label it so it looks like your workspace and not Basecamp's. It is very good that you can share access with people inside and outside of your company to get the project done. The company that makes the software, 37 Signals also creates more tools for what they call their consumer base, the small and medium sized businesses. These tools are intended for chatting in the group (Campfire), tracking your contacts (Highrise), and organizing your businesses (Backpack). But what is more important about this particular application is not only that is probably the first real hit in the SaaS project management software market, maybe even first web 2.0 product, but that it has a whole range of extras and add-ons working with the core package as well. These can be different types of software that integrate into the Basecamp API (application programming interface), as well as mobile clients that allow you to use Basecamp on your smartphone, like your iPhone and Android phone or Blackberry. This truly makes it unique and groundbreaking.

Pricing is in the range of 24\$ per month up to 149\$ per month. These all have unlimited users and all but the lowest pay model have time tracking included. They then award 5GB storage to 75GB of storage to their users depending on their model, and 15 projects to unlimited in the max pay model.

### 3.2.4 WRIKE

Figure 10: Wrike.com



Source: Wrike.com website, 2010.

Wrike is an intuitive project management web application that attempts to increase the efficiency of any business, by saving time and resources. Trying to solve the usual managerial

problems, such as email in-box chaos, spreadsheets and disconnected files, Wrike wants to be at the same time simple to use and complete, incorporating all the tools that a company, be it small or large, requires.

The first thing to note about Wrike's unique capabilities is its so called Intelligent Email Engine. You can create and update tasks without logging in to the system. Simply CC your emails with tasks to [wrike@wrike.com](mailto:wrike@wrike.com). What this means is that by adding this address to your emails it will automatically copy tasks from emails to project plans. It notifies about assignments and changes, while also reminding about pending tasks and pulling status updates from team members. This way saves you time and energy by sending automatic task reminders to your employees. The updates are also updated in real time, so there is less time spent on updating the project summary. Files can also be attached and the system will automatically add this to the task in the summary report and add the recipients and the sender to the people responsible for it. This system works with any modern email client, while it also reminds and provides the updates through that email address. This is also incorporated into their so called Dynamic Timeline and is basically a more real time updated Gantt chart with the ability to see through the dependencies, and project members involved with few clicks of the interface. This timeline is created through your tasks that you schedule via email but it also allows for easy drag and drop manipulation.

Multi-project management is enabled in Wrike by its Flexible Structures. These group your projects in an easy way to allow you share with whom you want and disclose only those aspects you need. This is useful for disclosing only the parts u want to any outside parties that are involved.

Pricing on wrike is a bit different from those reviewed till now. It charges for different roles in the usage. A collaborator is charged 9,95\$ per user per month and collaborators can create and edit tasks, view and update project plans on the timeline. They also have 500Mb of storage per each of them. Managers have task version control, can create templates, build task dependencies and run reports. This brings you also 5GB of file storage but at the cost of 19,95\$ per user per month. If u wish to add viewers you are charged 9,95\$ per month and viewers can view tasks, receive notifications about changes and mark tasks as completed. These are unlimited by how many u have.

### **3.2.5 GOOGLE APPS MARKETPLACE**

Google's services are well known to all who use the web daily, since we use Google search predominantly and many of us use Google's email offering Gmail. This as well as Google Docs, Calendar, Chat and Sites is what constitutes the Apps offering. These are Web applications with features and functionality similar to traditional office suites.

Gmail is the email client Google provides users free of charge, but instead relying on

advertising for the revenue. The user currently 7,484 GB of storage available for emails and the number is still rising. It started in 2004 with 1 GB of storage. Access to it is enabled through webmail, POP3 as well as IMAP. Integrated into Gmail is Google Chat a communication tool for chatting with your Gmail contacts. It also offers a standalone Windows version product as well as integration with most multi protocol chat clients. Additionally a video and voice plug-in was developed for Gmail where users can chat in Skype style with other contacts that have the plug-in as well. Google Calendar is the accompanying time management application. Contacts are integrated into both Gmail and Google calendar allowing for easier communication. Additionally to it is Google Docs, a free Web-based word processor, spreadsheet, presentation, form, and data storage service offered by Google. It allows users to create and edit documents online while collaborating in real-time with other users. The data storage part is interesting and was announced in January 2010. A total storage of 1 GB is free and the price of additional is 0.25\$ per GB. This is to allow companies to use their traditional file types along Google docs files. Lastly there is Google Sites which a structured wiki offered by Google.

But regardless of all of these features and applications, there is only its web access that separates it from traditional office and productivity suites, and even less separating it from Zoho's offering. And it still lacks project management capabilities other than using its spreadsheet programs to create your own templates or use premade ones. This is where Google Apps Marketplace comes in.

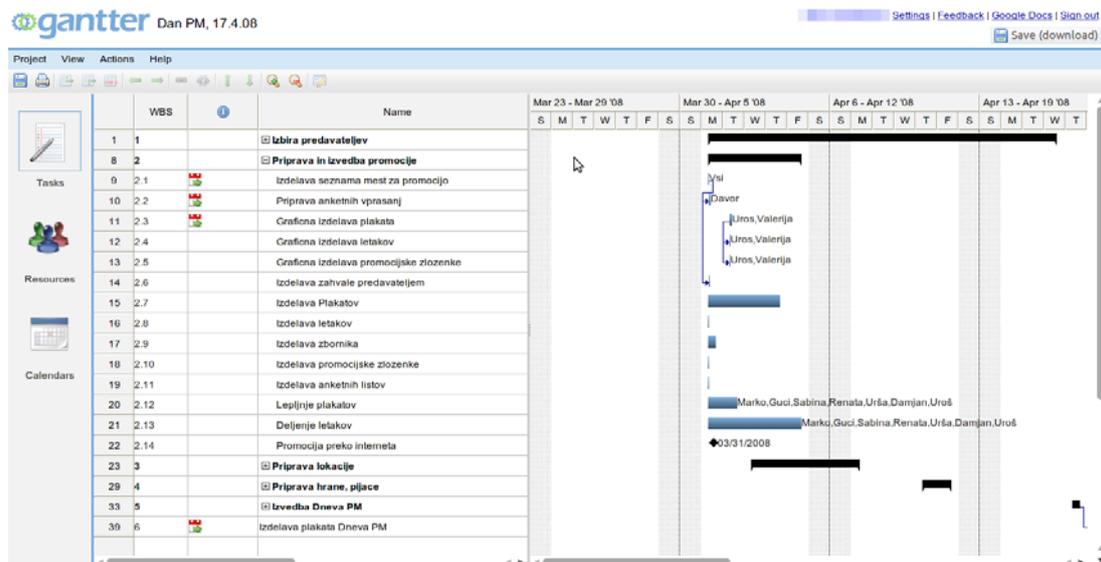
Google Apps Marketplace allows users to use their existing Google accounts, whether it is Standard users or Business ones. The Google Apps Marketplace offers products and services designed for Google users, including installable applications that integrate directly with Google Apps. Installable applications are easy to use because they include single sign-on, Google's universal navigation, and some even include features that integrate with the companies own domain data.

And in this Google Apps Marketplace there are a lot of interesting project management applications, which can enrich the already valuable office suite of Google. Out of the many available I will present a few that are interesting and or popular currently on the market.

The first one is Gantter.com which is a free MS Project alternative based in the Web, and now able to integrate into Google Docs, though only on Firefox and Chrome browsers since it needs a plug-in to do so. It even has the ability to import MS Project Files and opens them with no problems. Apart from that it can import Google Docs files, spreadsheets, and has a relatively straightforward user interface. If you are familiar with MS Project this should pose no problems to you. It schedules tasks, resources and presents you with the WBS matrix and even is able to adjust the calendar according to 3 templates (Standard, 24 Hour and Night Shift). Unfortunately I haven't found it to be able to present you with the critical path or any

sort of report features. Saving is enabled to a desktop file, Google Docs file and even exporting to MS Project, but only xml, as well as exporting your desktop calendar or even web calendaring service.

Figure 11: Gantter



Source: Gantter website, 2010.

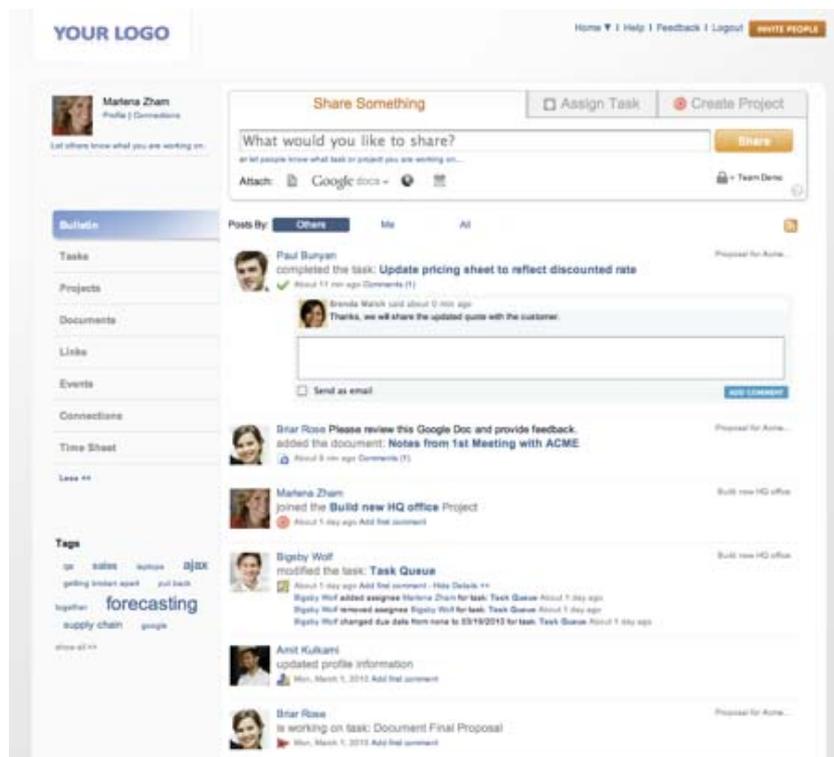
The next one to review is a less Gantt focused application and more focused on collaboration called Manymoon. It looks and feels very similar to Basecamp, but is a bit less responsive. The Google Apps Marketplace lists it as the most popular project management tool. Though from using it doesn't have the distinct feel of a PM tool. It has no Gantt chart and by the greeting page one is more drawn to its similarity with Facebook than a software tool that helps manage projects. It does however have features that make it very useful in connection with Google Apps. It integrates with Gmail, Calendar and Docs.

A Gmail conversation can quickly be turned into either a project or task, with options on involving the conversation participants into the created document, and including the documents listed in it as well. It even auto creates it so all you have to do is fix the details and the project is created. Similarly you can, from within the Manymoon, create a Calendar for your team which can be shared by team members whether they are using Manymoon or not. All they have to do is accept the sent calendar into their Google Calendar and they receive updates on the projects or tasks milestones. The last, but from the default view of the application, primary function, is in its ability to easily share information with team members. Sharing Google Docs and thoughts is as simple as posting to your Facebook profile. Microblogging is really the best way to describe the work flow in the Manymoon application. You can create or link your documents with others. And these contacts you can import from your other online social networks like LinkedIn, Yahoo, Windows Live Messenger, and even

Outlook.

Pricing for this application is similar to the ones already portrayed and is primarily based on storage needs. It starts from 10, 25, and 100 GB of storage for which u pay either 19\$ per month, 29\$ per month or 69\$ per month. They are called the Silver, Gold and Platinum accounts. Apart from that is the free account which enables you 25 MB of storage and hasn't got the ability to print to PDF from the application, or create tasks from emails. The Silver account also has the talked about Project calendar abilities, reports, templates which can be created from an existing project to further project reuse, has privacy settings mode and time tracking ability. The gold account has the customized login page, email template, and company logo. You are also able to manage permissions and content. And finally the platinum is separated from its peer accounts with the ability to export projects and tasks.

Figure 12: Manymoon

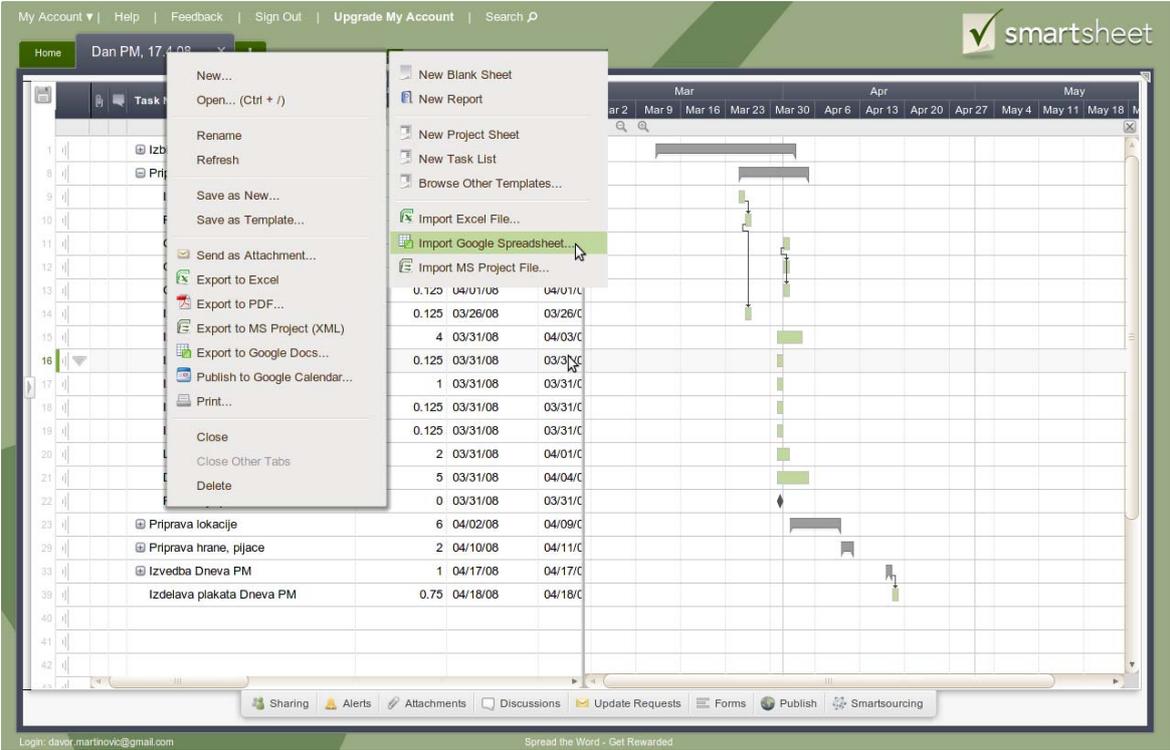


Source: Manymoon website, 2010.

The last application from the Google Apps Marketplace which I will review is Smartsheet. As the name implies it handles spreadsheets very well and imports them from either Google Docs spreadsheets or MS Excel files. Additionally it also has the ability to import MS Project Files with ease. The default view of the application is very similar to the desktop software people are used to and shows the user the tasks list with the WBS and the Gantt chart to the side. But to differentiate it from Gantter.com there is the home page which for every user gives a

customized dashboard with reminders, to do lists, recent sheets that u had worked on, and favorite rows of work currently (the WBS rows you currently are most focused on). The Home page also offers up a view of all the sheets you currently work on and the Template section from which u can easily reuse the appropriate one for your projects. It also offers up a view of the deleted items, which is handy for all of us that hit the delete button accidentally. To come back to the WBS list and Gantt chart they are both easily manipulated through drag and drop, which makes life easier and plan-adjustment as well. Another thing worth noting is the ability to easily attach files and conversations to the WBS rows which in turn incorporates today’s social communication with the traditional view of project management. This is interesting but questionable in a project with hundreds of rows, where the user would easily get lost in the discussions and files attached. Luckily the creators of Smartsheet envisioned such a problem and created a tool bar on the bottom of the sheet with buttons to list all attachments or discussions on the current worksheet. The toolbar also includes features for sharing and creating alerts, as well as sending update requests, forms (can be created and then emailed or embedded in a web page) and publish it all via a publish link. The application also has excellent tools for exporting to, which include the spreadsheets it can import to (MS Excel, Google Docs spreadsheet), as well as PDF and MS Project (xml only and not the proprietary mpp file type).

Figure 13: Smartsheet



Source: Smartsheet websie, 2010.

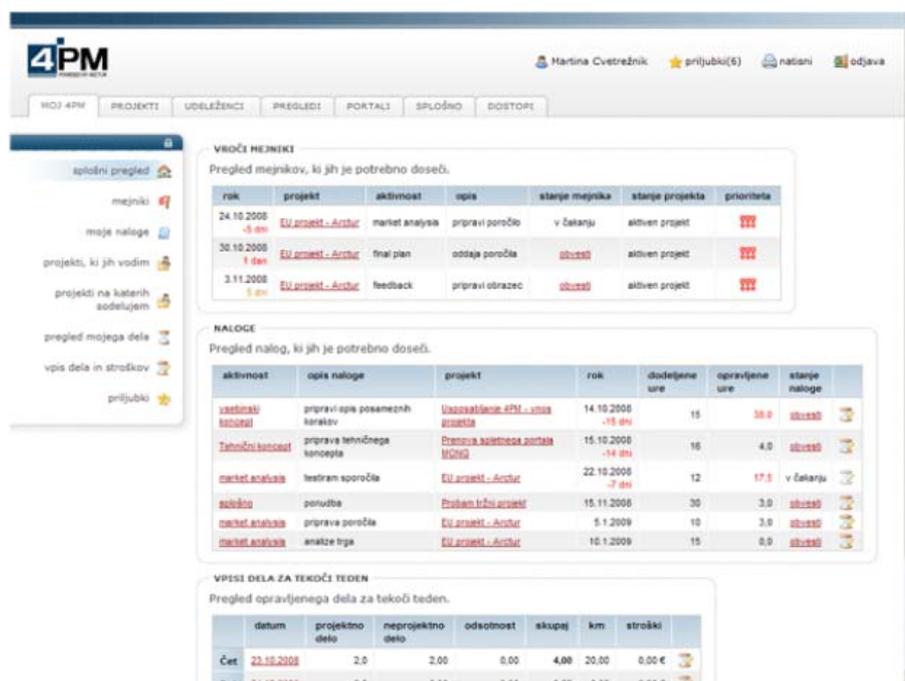
Pricing on Smartsheet is similar to the other vendors we reviewed till now. They have five categories, which are separated by storage and sheets. The user types are basic, advanced,

team, team plus and enterprise and their storage availabilities are 3 GB to 100 GB. The prices range from 9,95\$/month to 149\$/month. More noteworthy are the sheets that users can create. Basic users can create 10 and goes up to 1000 with enterprise users. Users in these sheets are unlimited.

### 3.2.6 4PM

4PM (For Project Management) is an information system that facilitates monitoring ongoing projects. Being based on advanced web technologies makes it accessible from any computer connected to the Internet. 4PM is also a product at home in Slovenia, and it incorporates project management tools into the web. It has the classic tools that are needed in such a tool like management views, resource usage, planning and realization, financial monitoring of the project, as well as outlook synchronization, project portals with document management and communication in the project group. It does lack however Gantt chart capabilities and work breakdown structures. They offer their product in Slovenian, English and Italian.

Figure 14: 4PM



Source: 4PM website, 2010.

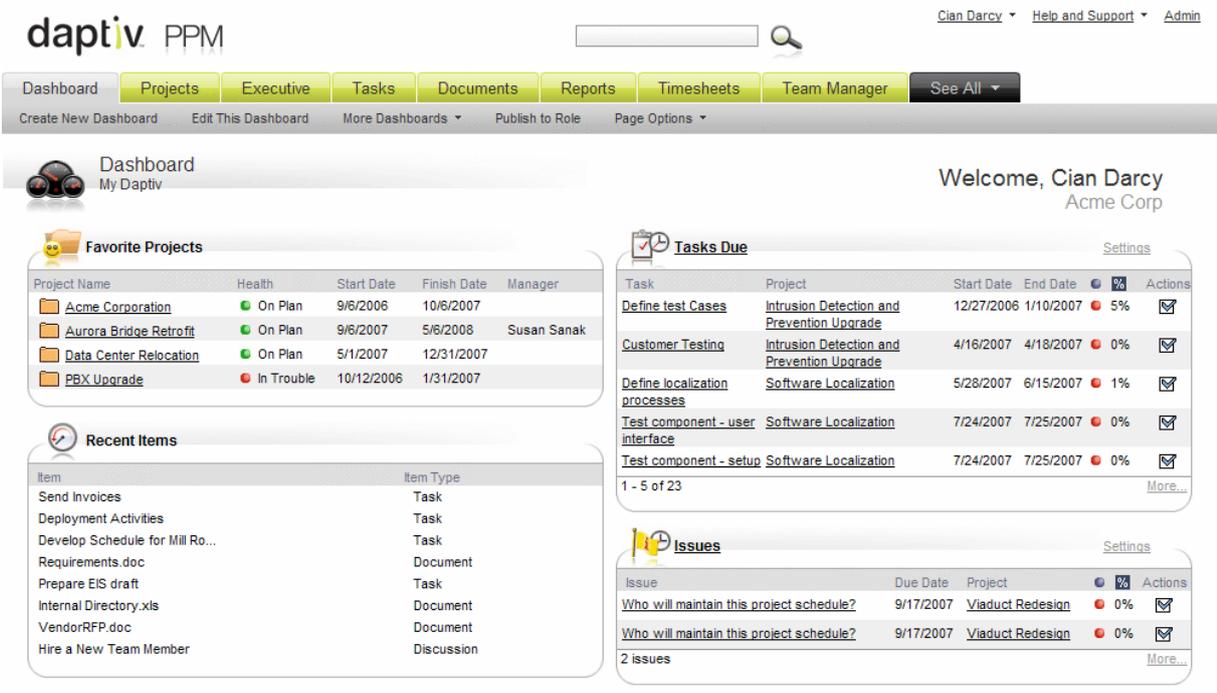
4PM pricing is a bit different that from out previous software vendors, who although they all had flexible pricing, their pricing was standardized per user. With 4PM this is associated with personalization on the user level. Firstly the user identifies their needs in one of the possible 4PM variants that the company has to offer. These consist of 4PM for architects, design studios, engineers, industry users, government agencies, health and medicine, educational institutions, IT companies, tourist offices, 4PM for co-financed projects and a 4PM solution

made for you. While we cannot compare the pricing as we don't even have enough insight to the standardized packages this nevertheless is an interesting approach from a small vendor when trying to reach a diversified crowd of users. Offering flexibility in the package for different users is a great feature in itself.

### 3.2.7 DAPTIV PPM

Daptiv touts itself as the number one on-demand PPM solution which is a pretty bold statement in itself. They also say that over 500 companies trust Daptiv to run their business. From the numbers it would seem they are successful and could be telling the truth with their market statement, but lets look at how they are identified in research papers on the topic of PPM. We will take a look a two of the most known ones out there. The Forrester Wave for PPM software vendors in Q4 of 2009 and Gartner’s 2009 Magic Quadrant for IT Project and Portfolio Management.

Figure 15: Daptiv PPM



Source: Daptiv website, 2010.

Forrester Wave states that Daptiv is one of the early pioneers of the PPM SaaS market and is consistently strong in its approach to PPM. It’s versatile, providing a user-friendly entrance into PPM for organizations that are reluctant to take a big-bang approach to portfolio management. Daptiv has historically focused on smaller departments and organizations, however, as it begins to target enterprise deployments, organizations should consider Daptiv as another lean PPM alternative. Such praise from one of the leading research papers published yearly on the topic of PPM is surely a bolster to their statements. Similarly the Gartner 2009 Magic Quadrant for IT Project and Portfolio Management describes their

strengths as that of being useful in their features and core functions at a cost-effective price. Because it is provided as an outsourced application service customers see an advantage to the speed of deployment and low support footprint required to manage it for their end users. The cautions are seen in the lack of advanced support and missing Agile Development methodologies.

It is an On Demand solution that offers collaboration software and resource management on top of project management tools. Collaboration is enabled by an Issue system that allows you to post problems regarding a project and track which issues have been resolved. Daptiv also sends out email notifications when an issue is edited, completed or deleted. It also offers a forum where anyone can give input to a project, acting as a way to brainstorm and organize ideas. It also features a comprehensive list of resource management features. A key component of the project management software is the ability to view resource allocation, which lets you oversee the workload for each employee and reallocate tasks if necessary. Daptiv also includes resource details and skill sheets which allow project managers to determine which employee is best suited for a given task. Employees can then manage and update their time spent on a project by using the time sheets. This information can then be exported to timesheets for use with accounting software. The vendor also claims that projects created in Microsoft Project can also be integrated with Daptiv and vice-versa. Pricing is hidden from the potential customer as they encourage the users to seek out customer support in order to get details about the usage plans and associated costs.

### **3.2.8 @TASK**

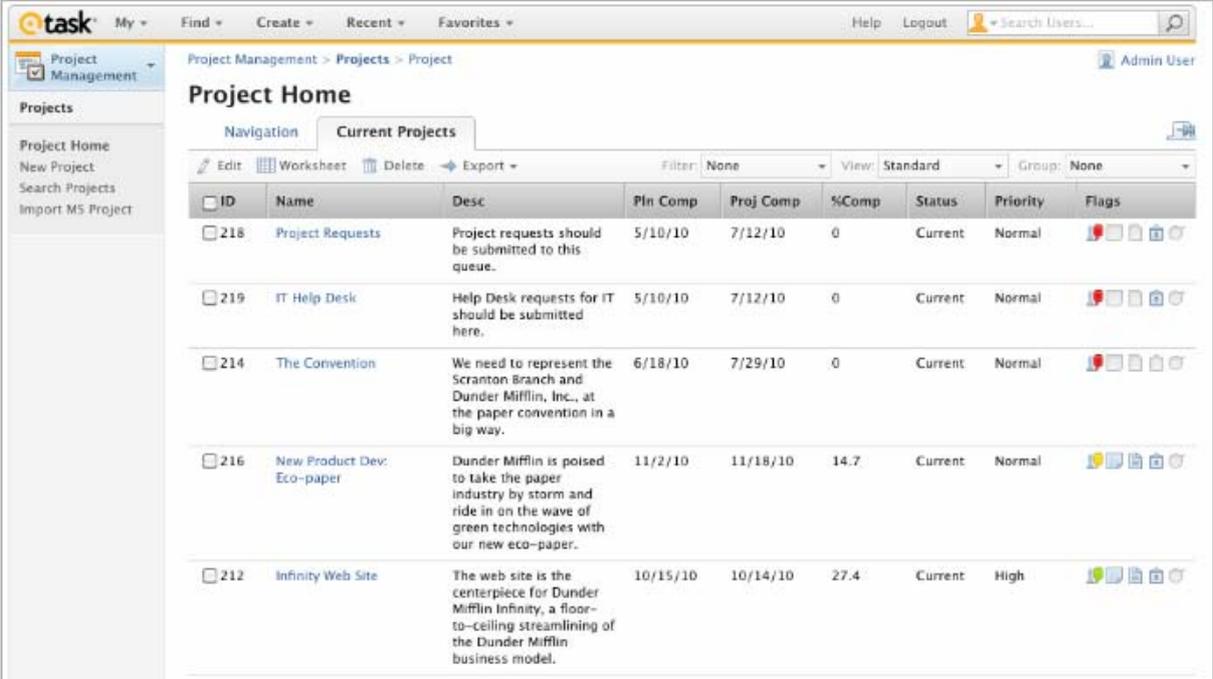
The last software that we will review is similarly to Daptiv PPM, a complete solution for companies that apart from project management also need project portfolio management, collaboration tools and more. Like with Daptiv we will look at how Forrester and Gartner researchers reviewed the tools.

In Forrester's research they conclude that @task provides compelling support for lean PPM. It started as a team-focused work management tool that has evolved into a product that enables users to take planning from the portfolio level to the project and activity management level without sacrificing its easy-to-use, streamlined approach. @task is one of the fastest-growing vendors in the PPM market with good reason, as it delivers an economical entry point for customers that want to start building PPM maturity but lack the wallet or the rigor required for a more robust system. Provided that @task can sustain this growth in the long run, Forrester expects to see it emerge to be a challenger for a leadership position.

Similarly Gartner's researchers see the strengths in the addition of program management and portfolio management analysis and support, and business case generation processes, in combination with @task's ability to grow in maturity as a customer matures, are key strengths

of the application services. Another strength is in their flexibility. In the sense that, if the product does not ship with certain workflows or processes or data templates, users can build these into the tool and customize them to suit specific needs.

Figure 16: @task



Source: @task website, 2010.

@task is a browser based program, accessible by anyone from anywhere with an internet connection. This lets each individual user customize the display and utilize only the useful information and navigational tools. @task also has a capacity planner that lets you add a project to a schedule and calculate if it is feasible to accomplish during a set period. This feature compares the resources you have to the resources the project requires. You can easily drag and drop the project to a different time, calculating the best time frame to proceed with the project. Another unique feature to @task is Klik, a desktop application that lets you update projects, send notes and manage resources, all while offline. Klik then syncs the project when you log on to make the necessary changes and update all information. But @task's prime feature of the software is the ability to keep everyone involved in a project on track with updates and changes. It has more than 50 standard reports that can be sent out instantaneously for better organization. The Gantt charts that are accessible in the program compliment the reports to help the entire team stay organized and efficient. Additionally, each member involved with the project will have an interface and information customized to his or her needs. Projects created on Microsoft Project can be integrated with @task and vice-versa. The pricing information is very limited as the vendor clearly wants potential customers to seek personal consulting and a personalized solution before going into detail about the costs.

### 3.3 CRITERIA FOR CHOOSING

Table 2: Reviewed software packages by features

<b>Open Source Software</b>	Collab.	Issue track. sys.	Scheduling	Budgeting	PPM	Resource M	Document M	.mpp	Web	License
Open Workbench	No	No	Yes	Yes	No	Yes	No	Yes	No	Open Source
Openproj	No	No	Yes	Yes	No	Yes	No	Yes	No	Open Source
Ganttproject	No	No	Yes	No	No	Yes	No	Yes	No	Open Source
Taskjuggler	Yes	No	Yes	Yes	No	Yes	No	No	No	Open Source
Kplato	No	No	Yes	No	No	Yes	No	No	No	Open Source
Microsoft Project	No	No	Yes	Yes	No	Yes	No		No	Proprietary
<b>SaaS</b>	Collab.	Issue track. Sys.	Scheduling	Budgeting	PPM	Resource M	Document M	.mpp	Web	License
Daptiv	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Proprietary
@task	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Proprietary
Basecamp	Yes	No	No	Yes	No	Yes	Yes	No	Yes	Proprietary
Wrike	Yes	Yes	Yes	No	No	No	No	Yes	Yes	Proprietary
Zoho Projects	Yes	No	No	No	No	Yes	Yes	No	Yes	Proprietary
Google Apps Marketplace	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Proprietary
4pm.si	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Proprietary
Intrix Project	Yes	No	No	No	No	Yes	Yes	No	Yes	Proprietary

Table information: Collab. - Collaboration software, Issue track. Sys. - Issue tracking system, PPM – Project Portfolio Management, Resource M – Resource Management, Document M – Document Management, .mpp – MS Project proprietary file format ,Web – Web enabled usage

The software we analyzed was examined more through the eyes of a user first coming into contact with it. But the users want more information on this, they want to know how this software is able to perform in business environments. This is where we will apply the list of ten features that automated support can help with.

Our Open Source packages are mostly just feature copies of MS Project. In this they are all able to create lists and milestones in the traditional way of operating with WBS matrices and Gantt charts, so they have these features. Most of them also provide good resource allocation features although Ganttproject and Kplato don't allow for more capable budgeting tools. Real time information as to being able to record and report actuals against the plan is enabled only in those who have efficient reporting tools. OpenProj, OpenWorkbench and Taskjuggler are the ones that do, with a special note as to Taskjuggler being a static type system. Crashing the model is possible but only in the sense of testing the critical path with alterations and deviations from the plan. Although you can in most stress test your resources as well. None of them can record the assumptions though. As before said Gantt charts are a part of all our open source packages so they all have this feature. They lack the tools for project portfolio management and do not provide for personalized dashboards or even views. So our Open Source software packages are only able to cover the functions that MS Project can cover and would need more integration with other software or tools in order to support all of them.

The On Demand software is on the other hand more heterogeneous in capabilities, since they either support most or many of the functions or cover some of the functions in the list. Daptiv

PPM and @task cover all of the functions and are even able to store and reuse project metrics for future projects. That was to be expected from such a complete solution as theirs is. Basecamp and Google Apps are unique in the sense that they can support all of the features or just some of them, since you can easily expand the necessary software with packages that have come up in their ecosystems and have support for all of the functions. Though judging by only their own offering they cover only a few of the functions from our list. Wrike on the other hand is more fixed on its email engine which allows for developing objectives and providing prioritized to do lists, while it also has capable Gantt charts in its Dynamic Timeline and can manipulate these Gantt charts to see how it affects the plan. It lacks in estimate calculation, recording these assumptions and real time information on the plan. Coming to Zoho Projects the usage is more enabled to be an efficient collaboration suite, through its chat and posting features, with very good forums and wikis which can store and reuse metrics for later use. Sadly it doesn't offer Gantt capabilities, WBS matrices or Budgeting tools. Crashing the model is also hard since there is no model created, just a to do list with milestones. Last on the list are the two Slovenian providers. Intrix is the more standard one with Gantt charts, work breakdown structures and even personalized dashboards. It also does to do lists and milestones very well. 4PM on the other hand is very capable in giving personalized views, storing project information in project portals and its budgeting tools. Sadly it doesn't have Gantt capabilities or work breakdown structures. So we can see that our reviewed software is, apart from the full featured suites that Daptiv PPM and @task provide, not able to support all the functions in the list and like open source only cover a few or more of them.

After reviewing all these solutions we should look at what is left for the customer, or better which to choose. The obvious would be to separate the customers into groups depending on how projects fit into their organizations. The first group would be those for whom projects represent just a part of the business process and those whose businesses consist mostly of projects and project type work.

For the first it would be recommended to use a package that is in line with their business partners or at least interoperable. In most cases this could mean to pick an open source tool that is compatible or better said has at least read support for MS Project files. OpenProj would fit the bill. This would substantially lower their total cost of ownership, while still allowing for cooperation in the scheduling of the project. Another option would even be to use the Gantt tool for this. If they already use Google Apps, even sign up for Smartsheet and their enhancement to Google's offering for project management. Compared to Gantt it offers even better importing and exporting features. But other open source tools like Ganttproject or Open Workbench would also fit in as well. Taskjuggler is a solution aimed at programmers, as well as anyone else, who wants to have detailed plans and doesn't need dynamic schedules, whereas Kplato is well suited for those who will work with the KDE desktop. Arguably there are few of those.

The second group should rather think about their project needs and then find a complete solution on which they should build upon. Providers like Daptiv and @task are the first to stand out and be counted as a full PPM and collaboration software tool that enables project-organized businesses to run. Though they seem a bit more fitting for the bigger businesses as they would probably have a steeper learning curve and more time to adopt the complex solution. Here is where Zoho Projects presents itself as a user friendly solution with collaboration software and incorporating the social web 2.0 thinking. What needs to be mentioned is that it lacks good quality resource management, scheduling and budgeting tools that standard project management software has. A solution for those who are still heavily invested into their email workflow is Wrike. They aim to remove the project manager from the daily routine and give these tasks to the Wrike automated email engine. Basecamp is also an alternative similar to Zoho but which is interesting from its perspective of allowing its users to access their data not just from any PC but also for having an app for that. They are the first to enable mobile access to their users and in that way allow for usage on the go. In an era of increasing mobile adoption in smartphones as well as mobile friendly devices like netbooks and tablet computers this is surely an amazing feature. It is so important, that I have in my research seen customers ask their providers when they will allow for their systems to be accessible through mobile devices, either through applications in app stores or native applications for the web. Speaking of web applications from the Google Apps Marketplace I only presented three potential software programs but many more exist. In the future it is foreseeable that even more will spring up in that channel and that the Google Apps Marketplace will be a compelling service. From the three Ganter.com is the simplest incorporating into Googles offering through a plug-in. Smartsheet is the most feature complete and is a direct replacement for MS Project in the web, which can be seen in its ability to import and export so many different file types including the .mpp format. And the last, Monymoon, is more of a social web 2.0 type product similar to Zoho but less polished and feature full.

The two Slovenian providers don't stand out, but not the way one would expect. Their products are just as complete as those from most of the other vendors. But what is more important is that they also have features that set them apart from the rest. 4PM is interesting that it not only differentiates its product for so many different types of potential users it also offers them the ability to personalize their product so that it fits their needs. It also offers very good budgeting tools and project portals that are created by the product itself, which host the files and the data of the team. They offer personalized views as well. Intrix offers tools to differentiate the users of their product so that a manager can have a tailored dashboard with only the information they want and need, as well as being able to quickly access this when they want. They also have the standard Gantt capabilities, work breakdown structures and budget management available in desktop packages. Companies from Slovenia or one of the other markets they are in would make a good deal in choosing them as their project management software.

If the user wants to choose one of the providers and needs more functions from our list covered he is well advised to include more software and thereby improve the functionality of his information system to his liking. Wiki and forum technology is freely available, for creating intranets or other knowledge bases and should definitely be explored. Communication tools like Skype or video conferencing and chat software and email products are all likely candidates to improve the information system.

## **CONCLUSION**

Project management software has come a long way from its days emerging onto the personal computer platform. It has seen advancements that helped it become more usable and more approachable, all the while lowering the cost for the user. It has added the portability from being able to run only on mainframes to where you can access your data and your software from a multitude of devices.

But more details have to change in order to reach a broader mass of project practitioners. If we hang on to the words that most of what people do, as organization or groups, are projects then the specter is as broad as that statement. More people need better project management software, while these need to become more affordable and more user friendly.

The first force that works on this goal is open source software. It markedly reduces the total cost of ownership and allows for more accessible tools to reach more people. The total cost of open source software is effectively zero, which is why it was so easy for me to use and test all those software products. Another reason why open source is so important is because it forces the market leader into rapid innovation to hold on to its lead in the market and fight off the approaches of the free versions to its product. Theoretically this should help push new functionality and features from the market leaders.

The next force that we see is Software as a Service, or On Demand software. This type of software eliminates the need to buy new versions of the same product you already own or to upgrade to the newest latest version and by that remove the migration risk in shifting to newer versions. New version are installed on the vendors servers and your data is safely guarded by them as well. You only need to pay a subscription fee per user base or some other type of agreement. As we implied before this also has its downside, with data lock being the worst one. When thinking about signing up for such a package the user should always have this in mind. From the many products we reviewed the vendors are very different amongst themselves when it comes to pricing. Some offer simplified pricing like Zoho or Basecamp based on users or storage of the buyer while others structure their pricing models even more complexly. This stands out as one of the weaker parts of the On Demand model since a user wants either a simplified, clear pricing model to choose from or wants to have it tailored to

him and the application he is choosing.

The topic of mobile use is such an important topic in today's software markets that it is not surprising to see this importance in the project management software market as well. Users are becoming ever increasingly mobile in their consumption of content and we can expect that they will want to use their mobile devices for project management as well. The same jump already happened when the software jumped from the mainframe to the personal computer platform and soon it will make the next jump onto mobile. A big hand in this is being played by the web and its ability to store our data without the need for local storage. We won't need to carry all the data with us in the pocket, we will be able access it whenever or wherever. Data will be handled by the On Demand providers and will be accessible from any device. This will bring project management closer to users instead of pushing them into the old paradigm of desktop charts, matrices and schedules. These desktop applications will still exist but will not be the way users cooperate on projects.

For all of those PMP users, that were surveyed, and that believe that better solutions have to exist than the ones they know, the project management software market is rapidly changing. It is becoming more approachable and it is becoming more tailored to the needs of users. There are not just MS Project clones that wish to emulate the successes that it has had in the past, but new types of software are coming into the market. Collaboration is at the heart of this movement as is the social web 2.0 movement which even proclaims project management 2.0 as being the new breed of software tailored for social project management.

At the end what must be admitted, when analyzing the project management software of today, is that the market is booming and broadening at the same time. It feels like the beginning days of the personal computer era as new applications keep coming out all the time. There is no winner in our analysis but the users. The users have a plethora of options at their disposal and this is a good thing. The list of software I have presented is only true for now but will soon change as our providers will offer more and better packages and new providers will come out with theirs.

## **APPENDIX**

### **APPENDIX 1: POVZETEK NALOGE V SLOVENSKEM JEZIKU**

#### **ANALIZA INFORMACIJSKIH ORODIJ PROJEKTNEGA MANAGEMENTA**

##### **UVOD**

Projekti postajajo vse bolj stalnica v dnevnem redu organizacij. Brez njih si skoraj ne moremo predstavljati poteka dela. Pa prav tako projekti niso nič novega, saj obstajajo že od davnih prednikov. Graditelji piramid so se soočali z istimi težavami kvalitete, obsega in omejenih virov kot graditelji, inženirji ter programerji v njihovih projektih danes. Potreba po boljšem projektne managementu in boljšo programsko opremo zanj pa obstaja tako pri malih, srednjih in velikih podjetjih, kot tudi pri posameznikih. Skozi leta se je informacijska podpora močno popravila. Od dni projektne pisarn, katere so kategorizirale podatke v omarah z mapami do današnjih pristopov informacijskih sistemov in baz podatkov, se je informacijska podpora v mnogočem popravila. Posebej vpadljiva je številčnost paketov, ki so na voljo na trgu.

Ampak prav z to številčnostjo pridemo do problema s katerim se danes uporabniki soočajo. Katera orodja izbrati in po katerih kriterijih? Že Nemeč-Pečjak je predstavil ta problem v svojem dokumentu, *Informacijska podpora projektne managementu* (2009), kjer je zbral sto različnih paketov za uporabo. Noben uporabnik se noče soočiti z vprašanji kako in katerega izbrati, pri tako velikem izboru. V svoji analizi bom poskušal odgovoriti na to vprašanje, kaj in kako izbrati, ter dati vpogled v programsko opremo, ki je na voljo. Predmet raziskave bo v tem primeru programska oprema za podporo projektne managementu. Projekti potrebujejo informacijsko podporo, da lahko management sprejema obveščene odločitve. Ta informacijska podpora pa dandanes prihaja iz informacijskih sistemov. Informacijski sistem je integriran set komponent za zbiranje, shranjevanje, procesiranje in komunikacijo informacij. Vse organizacije pa ne potrebujejo celovite rešitve za njihove potrebe saj le te zahtevajo visoke investicije v času in denarju, ter kadrih za doseg želenega. Potrebna je analiza njihovih potreb za sprejetje pravega paketa. Upabniki si tudi želijo več mobilnosti v njihovi uporabi programske opreme, kar vključuje manjšo odvisnost od namiznih aplikacij, ter tudi sposobnost dostopa skozi novodobne mobilne naprave. Interakcija z sodelavci in deležniki v projektu je tudi zelo pomembna, kjer nastopi vpliv socialnega medmrežja in spleta 2.0 na programsko opremo, ki je na trgu danes.

Cilj mojega dela je analizirati programsko opremo za management projektov, da lahko potem, na podlagi raziskanega, podam mnenje za kogar so primerne predstavljene rešitve. Za to bom moral povzeti kaj teorija govori o informacijskih sistemih, ter kako razlikuje med temi in informacijskimi orodji. Le potem bom lahko naučeno uporabil pri analizi programske opreme.

Namen dela, katerega sem si zastavil, je opisati vlogo programske opreme za management projektov, kot tudi predstaviti kako uporabniki gledajo nanjo. Poleg tega bom poskusil bralca napotiti na nekaj bolj inovativnih rešitev na trgu. Ker pa je uporabnikom težko izbrati pravi paket za svoje potrebe bom na koncu dal predloge komu je posamezen paket najbolj primeren.

Pri metodi dela sem se moral najprej spoprijateljiti z teorijo in nato na podlagi pridobljenega znanja analizirati posamezne pakete programske opreme. Opisati sem moral razliko med informacijskim sistemom za projektni management, ter orodjem, kot opisati kaj sploh je programska oprema za management projektov. Vključeni v delo sta tudi dve raziskavi, ki predstavljata izkušnje uporabnikov z paketi programske opreme za projektni management. Ti omogočata vpogled nato kako uporabniki gledajo na njih in kaj se jim zdi uporabno, ter kje vidijo pomanjkljivosti. Pakete katere sem izbral sem sam preizkusil, ter analiziral skozi pridobljeno teoretično znanje.

Struktura naloge je naslednja. V uvodu sem predstavil projektni management in njegova orodja, ter opisal že omenjene razlike med informacijskim sistemom za projektni management, ter njihovimi orodji in programsko opremo. Ta preskok mi je nato omogočil, da sem lahko od informacijskih sistemov za projektni management, ter orodij katere se uporabljajo prešel na programsko opremo. Temu sledi analiza trga, kjer povzemam raziskavi na področju izkušenj uporabnikov z programsko opremo za projektni management. Nato pa predstavitev samih paketov, kjer sem najprej predstavil odprto-kodne pakete, kateri so prosto dostopni, ter v nadaljevanju SaaS paketi, kateri se licencirajo z naročnino na storitev. Na koncu bom predstavil spisek opreme, po njeni dostopnosti, kateri je dodana primerjava med posameznimi paketi. Na koncu bom dal povzetek ugotovljene analize in sklenil katerim uporabnikom najboljše koristijo predstavljeni paketi.

## **PROJEKTNI MANAGEMENT IN ORODJA**

### **KAJ JE PROJEKTNI MANAGEMENT**

Preden se lahko lotimo programske opreme za projektni management moramo najprej razčistiti kaj sploh je projektni management in kaj je sploh projekt. Projekt lahko opredelimo kot podjem (širšo dejavnost, delo) med seboj povezanih zaposlenih, sredstev in aktivnosti, za katerega so značilni neponovljivost projektne procesa in enkratnost proizvoda ali storitve, s tem časovna omejenost celotne dejavnosti in sodelovanje različnih sodelavcev in sredstev v projektu (Rozman, Stare 2008).

Projektni management oz. management projekta pa je v osnovi upravljanje časa, virov, stroškov in vodenje ljudi. V okviru managementa projekta pa se soočamo z istimi podjemi načrtovanja, uveljavljanja projekta, ter kontrole, kot v vsakem drugem delu managementa. Management projekta je v metodološkem smislu odločanje, ki sledi splošnemu procesu

odločanja. Nanaša se na povezovanje aktivnosti, določanje rokov, zagotavljanje kakovosti projekta, dodeljevanje sredstev in podobno. Poteka kot preprečevanje problemov, a tudi kot njihovo reševanje, če že nastopijo: ugotavljanje možnih in dejanskih težav, iskanje alternativnih rešitev in izbire med njimi (Rozman, Stare 2009).

## **PROJEKTNI INFORMACIJSKI SISTEM**

Projektni informacijski sistem zagotavlja obvladovanje pretoka informacij in dokumentacije projekta. Lahko je sestavljen iz več podsistemov, ki podpirajo različna področja. Nobeden od podsistemov ne more delovati neodvisno od drugih, saj so tudi meje med njimi le teoretične. Nekateri so lahko združeni, struktura pa je odvisna od tega, ali imamo računalniško podprt informacijski sistem, saj so programski paketi različno izvedeni (Rozman, Stare 2009).

Sodoben računalniško podprt projektni informacijski sistem naj bi bil podprt z dosežki sodobne informacijske tehnologije. Časovno načrtovanje, risanje diagramov in sledenje nalog so kot ustvarjene naloge za računalnik, še posebno v primeru, če ima projekt več sto ali tisoč aktivnosti (Meredith in Mantel 2005).

Kar je treba poudariti je to da projektni informacijski sistem ni le en paket ali naša lastna aplikacija. Lahko je kombinacija različnih komercialnih orodij in lastnih razvitih aplikacij. Dejstvo, ki loči skupino orodij od informacijskega sistema je v sposobnosti aplikacij v projektne informacijskem sistemu, da razumejo podatke na enak način in si jih tako delijo. To odpravlja nepotrebno dvojno vnašanje podatkov. Če je potrebno kopiranje podatkov iz ene aplikacije v drugo potem to ni pravi projektni informacijski sistem.

## **PROGRAMSKA OPREMA ZA PODORO PROJEKTNEMU MANAGEMENTU**

Po opredelitvi projektov, njihovega managementa, ter samih informacijskih sistemov, ki so v uporabi moramo sedaj opredeliti kaj spada pod programsko opremo za podporo projektne managementu. Povzel bom delo Nemeč-Pečjaka, ter opredelil programsko opremo za podporo projektne managementu, kot vse aplikacije, ki nam pomagajo pri planiranju projekta, obvladovanju virov, kolaboraciji, obvladovanju dokumentacije, obvladovanju nabora projektov, ter sistemom sledenja problemov.

Najbolj primeren paket za moderne projekte bi bil spletni, kateri bi uporabljal relacijske baze podatkov, bil razširljiv, ter imel moderen grafični vmesnik in vse funkcije katere so potrebne za projekt in njegove sodelujoče.

## **PROJEKTNI MANAGEMENT 2.0**

Dandanes srečamo skoraj povsod vpliv medmrežja na podjetja, projektne management tukaj ni

izjema. Projektni management 2.0 se v večini krogov gleda samo z vidika novega trenda na trgu, saj nima korenin v teoriji ampak v socialnem spletu, ki prevzema svet. Ta socialni vidik je tudi osnova, za kar se oprijemajo predstavniki te ideje. Vključiti interaktivno deljenje informacij, sodelovanje, vse za kar stoji splet 2.0. Spletna stran, ki spada v to kategorijo, omogoča uporabnikom interakcije med sabo v obliki prispevkov vsebini, kar je v popolnem nasprotju spletnim stranem, kjer so uporabniki le omejeni na pasivno gledanje informacij, ki so jim ponujene. Primeri tega so spletne skupnosti, spletne aplikacije, novodobne socialne mreže, wiki strani, ter spletni dnevniki. Po tem zaključku bi lahko sklepali, da je projektni management 2.0 naravna evolucija projektnega managementa, katero je prinesla novodobna tehnologija spleta 2.0. Treba pa si je zapomniti, da je to tehnologija, katero spodbujajo proizvajalci programske opreme in ne teoretična dognanja.

## **TRŽNA ANALIZA**

Trg programske opreme za projektni management je potencialno velik trg, glede na dejstvo, da že leta poslušamo, kako so projekti del vsakdana. To velja za organizacije, kot tudi za naše projekte doma. Vse od investicij, kompleksnih konstrukcij, raziskav in razvoja do gradnje hiše, nakupa avta ali pa organiziranja potovanja, ter domačih praznovanj. Pa vseeno se mora zaključiti, da čeprav so projekti tako vseprisotni, jim ne namenjamo dovolj pozornosti, ali bolje rečeno, ne jemljemo dovolj resno naukov projektnega managementa. In če se že učenja projektnega managementa ne jemljejo resno potem je uporaba programske opreme za projektni management zagotovo obsojena na neuspeh.

Izsledke o neuporabi oz. nepravilni uporabi, ter sami nezadovoljnosti z programsko opremo vidimo tudi v raziskavah na področju. Raziskava med pretežno profesionalnimi projektnimi managerji, ki je potekala v letu 2008 s strani PMI organizacije, je pokazala veliko nezadovoljstvo z programsko opremo na voljo. To pa predvsem v funkcijah, ki so jih označili kot ključne za takšno programsko opremo. Priznali pa so, da so zmogljivosti paketov v organizacijah, v katerih so delovali, slabo izkoriščene. A kljub temu jih je le nekaj organizacij resno razmišljalo o zamenjavi na nov paket. Kot najbolj uporabljan paket je bil izbran MS Project.

Iz podobne raziskave, opravljene v Sloveniji je mogoče tudi razbrati slabo izrabljenost paketov v organizacijah. Ker je raziskava iz leta 2004, ki je roko na srce mogoče malo prestara za področje informacijske tehnologije, bo treba nanjo gledati bolj ostro. Kljub temu pa je zanimivo videti stanje v tistem trenutku na področju. Ta raziskava je ugotovila slabo izrabljenost paketov, a tudi slabo poznavanje s strani uporabnikov. Temu priča dejstvo, da je več kot dve tretjini označilo MS Project, kot svoj projektni informacijski sistem. MS Project je samo paket, ki pa potrebuje integracijo in dodatne investicije v opremi in virih, da ga lahko označimo kot projektni informacijski sistem. Ta izjava s strani uporabnikov je zelo zaskrbljujoča in je le lahko upati, da se je znanje na področju od tedaj popravilo in uporabniki

že razlikujejo med obema.

Ker je MS Project označen v obeh raziskavah, v Sloveniji in na tujem, kot najbolj znan paket s področja je treba tudi tega omeniti v delu. MS Project je programski paket za management projektov, ki je zasnovan da bi pomagal projektnim managerjem pri načrtovanju, obvladovanju virov, stroškov, ter nadziral napredek in analiziral obremenitve. Skozi leta uspešni MS Project, z najnovejšo 2010 verzijo, je očitno najbolj poznana rešitev na področju. V navezavi z MS Office Project Server ponudbo omogoča celo tiste zmogljivost, katere smo označili za vodilne s strani modernega programskega paketa za management projektov. Omogoča dostop s spleta, ima povezavo z relacijsko bazo, ter je večuporabniški. Vsa ta vrednost ima tudi svojo ceno. Za vsa mala podjetja, pa tudi srednja, je ta cena, ko vštujemo potrebne nadgraditve, precej visoka. Cena pa tudi ni zanemarljiva za vsa podjetja, ki nimajo visokih proračunov za informacijsko tehnologijo, katerih pa je po nedavni recesiji zagotovo nemalo.

## **ANALIZIRANA PROGRAMSKA OPREMA**

Programska oprema za management projektov obstaja že od prvih računalnikov in je celo ena izmed prvih, katera je prišla na namizja uporabnikov PC-jev. Pravzaprav je že Apple Lisa, kot prvi pravi omembe vredni osebni računalnik, vseboval programski paket za projektni management. Prav zaradi tega dejstva, da programska oprema obstaja že od začetkov osebnih računalnikov, je treba gledati kritično na trg, kjer najbolj poznana rešitev zahteva več sto EUR vsakih nekaj let za svoje nadgradnje oz. nove verzije. V zasičenem trgu je treba pričakovati pritiske na ceno in prav o teh je govora v analizi. Podobno, kot se je zgodilo na trgu pisarniške zbirke Microsofta, katere tržni delež ogrožajo vedno nove aplikacije, se bo pričakujem zgodilo tudi na trgu programske opreme za projektni management. Kot že omenjeno je MS Project brez strežniške ponudbe omejen na namizje in kot takšen ne omogoča sodelovanja. Izvoz podatkov je mogoč tudi samo v Microsoftovo .mpp vrsto datoteke oz. nekoliko bolj prijazno .xml datoteko, kar otežuje uporabo z drugimi programi.

Dve sili sta najbolj opazni, kateri spodbujata zniževanje cene, ter dajeta več mobilnosti uporabnikom. Prva je odprta koda, katera zaradi svoje narave zniževanja stroškov posedovanja programske opreme vpliva na ceno. Cena za uporabnike je efektivno nič. Je pa res, da je potrebno za vzdrževanje prav tako plačevati ali pa, v večini primerov, sam poskrbeti zanj. Zaradi te cene je prva uporaba ali pa poskus odprto-kodnih paketov za uporabnike zelo enostaven. V analizi so prav zaradi teh razlogov predstavljeni najprej odprto-kodnih paketi, kateri so prikazani z vidika primerljivosti z MS Project-om. Le ti so v večji meri zgrajeni v zgled Microsoftovem izdelku in je zato primerno pogledati kako so z njim kompatibilni oz. koliko njegove funkcionalnosti omogočajo.

Druga sila, katera tudi vpliva na trg in daje uporabnikom večje zmogljivosti, kot to nudijo

lahko namizne aplikacije je SaaS. Ta spletna tehnologija omogoča, kot že rečeno neodvisnost od namizja, ter ponuja vso funkcionalnost znano iz področja v spletnem brskalniku. Poleg tega vsi ponudniki paketov ponujajo brezplačno preizkusno dobo, ponavadi za obdobje tridesetih dni. Ti paketi pa niso le spletna različica MS Project-a. So tudi v mnogočem pod vplivom socialnih mrež, katera so tako zelo popularna v naših zasebnih življenjih. Facebook, ter Twitter je najbližje temu, čemur ta orodja stremijo. Lažje sodelovanje in deljenje informacij so glavne težnje. Glavne prednosti pa zagovorniki vidijo v tem, da ni potrebno nadgrajevati programske opreme, odpravljeno je vzdrževanje s strani kupca, večja fleksibilnost ter razširljivost samega sistem in zmanjševanje proračunov za informacijsko tehnologijo.

## **KRITERIJ IZBIRE**

Programska oprema je analizirana z vidika uporabnika, ki prvič pride v stik z njmi. A je za dobro izbiro potrebno več informacij. Odprto-kodni paketi so v veliki meri samo funkcijske kopije vodilnega paketa na trgu. Vse so sposobne ustvarjati spisek del in mejnikov z uporabo WBS matric in gantogramov. Večina jih tudi nudi dobro obvladovanje virov, ter tudi obvladovanja stroškov, z izjemo GanttProjecta in Kplato paketa. Primerjava sedanjega stanja projekta in poročanje je omogočeno skozi sistem poročil. OpenProj, OpenWorkbench in Taskjuggler vsi nudijo te, je pa treba spet poudariti, da je Taskjuggler statični sistem. Testiranje modela je možno na način spreminjanja postavk in opazovanja kako to vpliva na kritično pot. Možno spreminjanje obremenjenosti virov. Obvladovanje portfelja projektov ni omogočeno v nobenem od paketov, ter tudi ni možnih različnih pogledov na samo aplikacijo glede na uporabnika.

Ponudniki spletnih rešitev so v primerjavi z odprto-kodnimi bolj heterogeni v zmogljivostih, saj nekateri ponujajo vse funkcionalnosti z našega spiska ali pa ponujajo samo nekaj. Daptive PPM in @task nudita uporabnikom vse funkcije in sta tudi zmožni shranjevati in ponovno uporabiti projektne informacije za prihodnje projekte. To pa je od rešitve, kot je njuna, tudi bilo za pričakovati. Basecamp in Google Apps Marketplace pa sta zanimiva iz tega vidika, da same njihove aplikacije ne nudijo mnogo več, kot recimo odprto-kodne, se pa zlahka nadoknadi potreba skozi njihov ekosistem. Wrike je uporaben zaradi načina dela skozi elektronsko pošto. Nudi pa tudi urejanje ustvarjenih projektov skozi svoj vgrajen gantogram. Manjkajo mu podrobnejše obvladovanje virov, ter portfelja projekta. Pri Zoho Projects je bolj omogočena učinkovito sodelovanje, saj mu manjkajo gantogrami, WBS matrike ali pa obvladovanje virov. So pa njegove zmožnosti shranjevanja podatkov na enem mestu, tudi za prihodnje projekte, z spletnimi forumi in wiki strani zelo uporabni. Zadnja na spisku sta paketa slovenskih ponudnikov. Intrix je bolj standarden program z gantogrami, WBS matrikami in celo prilagojenimi pogledi na program. 4PM pa je bolj osredotočen na zbiranje podatkov za sodelujoče v projektu na enem mestu skozi projektne portale in svoje zelo dobro obvladovanje stroškov in virov. Žal nima gantogramov in WBS matrik za dela v

projektu. Vidimo lahko da tudi ponudba spletnih programov ne nudi vse funkcionalnosti našega spiska in je potrebno za več poiskati integracijo z drugimi programi.

Po pregledu vseh teh rešitev je treba pogledati kaj ostane za kupca, ter katero izbrati. Kupce lahko razdelimo na tiste katerim projekti predstavljajo le del poslovanja in tiste katerim je projektno delo osnova delovanja organizacije. Za tiste prve je priporočeno, da uporabljajo paket, ki je skladen z uporabo poslovnih partnerjev oz. vsaj sposoben branja in vnašanja datotek le tega. To lahko opravi odprto-kodna rešitev, ki je skladna z MS Project-om, saj smo videli, da je ta najbolj pogost paket v podjetjih. Od teh rešitev je najboljša OpenProj, je pa tudi Gantter dober zaradi svoje spletne narave. Če podjetje uporablja Google Apps pa še bolje in lahko celo razmisli o naročnini na Smartsheet paket saj omogoča najboljše zmogljivosti vnašanje in prenašanja MS Project datotek, ter tudi Excelovih preglednic. Ostali odprto-kodni paketi so tudi dobri, predvsem OpenWorkbench in Ganttproject.

Druga skupina naj raje razmisli o svojih potrebah in nato poišče celovito rešitev za svojo organizacijo. Ponudniki, kot je Daptiv in @task sta prvi, kateri bi spadali v to kategorijo. Je pa res, da so mogoče s svojo ponudbo bolj primerna za velika podjetja in vključujejo višjo krivuljo učenja od ostalih. Tukaj se ponudi Zoho Projects, kot uporabniku prijazna rešitev s svojo spletno ponudbo. Je pa treba imeti v mislih, da mu manjkajo gantogrami, obvladovanje stroškov in WBS matrike. Zanimiva rešitev za tiste, ki še vedno poslujejo največ skozi elektronsko pošto je Wrike. Basecamp je dober za vse tiste, ki so radi mobilni v svoji uporabi, saj omogoča dostop tudi skozi aplikacije na novodobnih pametnih telefonih. Ta funkcionalnost je tako pomembna, da je že opaziti interes uporabnikov drugih ponudnikov, ter povpraševanja kdaj bodo le ti ponujali podobne zmogljivosti. Pri spletnih aplikacijah iz Google Apps Marketplace je predstavljenih le tri od mnogih. Od teh treh je Gantter najbolj enostaven in nudi le osnovne funkcije, katere imajo tudi namizne odprto-kodne rešitve. Smartsheet je najboljša, ter nudi največ zmogljivosti, tako v samem delovanju, kot tudi integraciji z Google Apps in svojih možnosti prenašanja različnih datotek MS Projecta in Excela. Manymoon je uvrstiti, kot slabšo verzijo Zoho Projects z manj funkcijami in manj dovršenim videzom. Slovenska paketa sta v primerjava z mednarodnimi prav tako dobra v svojih zmogljivostih, če ne celo boljša na nekaterih področjih. 4PM ne samo, da nudi prilagoditve paketa glede na ponudnika, ampak tudi vsebuje zelo dobro obvladovanje virov, stroškov in projektne portale. Ti projektni portali se ustvarjajo v novih projektnih in vsebujejo vso dokumentacijo na voljo na enem mestu. Intrix pa je bolj podoben klasičnemu namiznemu paketu z svojim gantogrami, WBS matrikami in obvladovanji virov. Nudi pa tudi prilagojene poglede na program glede na uporabnika. Oba paketa predstavljata dobro izbiro za podjetja v jezikih, v katerih se storitvi ponujata.

Na koncu je treba dodati, da če si uporabniki želijo pokriti več funkcij z našega spiska, le te lahko dobijo tudi skozi druge pakete. Wiki, ter forumska tehnologija sta na voljo prosto vsem za kreiranje intranetov ali ostalih portalov znanja. Zanimiva pa so tudi orodja za

komunikacijo, ko je Skype in konferenčna programska oprema, ter tudi ne pozabimo na elektronsko pošto.

## **SKLEP**

Preteklo je dosti časa od dnevov, ko je programska oprema za management projektov prišla na osebne računalnike uporabnikov. Od tedaj je videla mnoge razvoje, ter je postala mnogo bolj uporabniku prijazna in pristopna, ter je vseskozi nižala svojo ceno. Pa vseeno spremembam ni konca. Da bi dosegli več uporabnikov morajo ponudniki razvijate še boljše storitve in pakete, ter se bolj prilagoditi potrebam uporabnikov.

Prva sila, ki vpliva na spremembe je odprta koda in njene aplikacije. Odprto-kodni paketi občutno znižajo ceno posedovanja programske opreme in omogočajo večjo dostopnost. Prav ta dostopnost je meni omogočila, da sem tako zlahka preizkusil vse te pakete. Obstaja pa še en razlog kako odprto-kodne rešitve vplivajo na trg. Pritisk na vodilne ponudnike, katere sili v inovacijo, da lahko še naprej ohranjajo svoj tržni delež. Teoretično bi to moralo vnesti na trg nove zmogljivosti in funkcije s strani vodilnih ponudnikov.

Druga sila, ki pa vpliva na spremembe so SaaS ponudniki. Njihove spletne storitve odpravljajo potrebo po kupovanju vedno novih verzij, ter tudi odpravlja plačevanje za nadgradnje. Nove verzije so nameščene na strežniku ponudnika, ter tako uporabnik nima več skrbi upravljanja z programsko opremo. Plačevati morate le za naročnino ali pa nek drugi način licenciranja storitve. To ima tudi svoje negativne strani, predvsem zaklep podatkov s strani ponudnika. Kupec mora ob sklepanju posla vedno imeti to pred očmi. Slaba je tudi shema plačevanja za večino ponudnikov. Le Zoho Projects in Basecamp imata pregleden način strukturiranja svojih kupcev glede na svoje potrebe po velikosti podatkovne baze ali pa številu uporabnikov.

Ker je tema mobilne uporabe tako pomembna jo velja zopet omeniti v zaključku, kot polje kjer se bo še kako v prihodnosti odvijalo mnogo inovacij na področju programske opreme za projektni management. Ker so uporabniki vedno bolj mobilni v svojem spremljanju in vnašanje spletnih vsebin, je za pričakovati, da bodo iskali to mobilnost tudi v delovnem okolju. Preskok na osebne računalnike se je zgodil že davno, le vprašanje časa pa je kdaj se bo zgodil preskok na mobilne naprave, kot so pametni telefoni in podobno. Pomembno vlogo v tem bo igral splet in njegova zmogljivost držanja naših podatkov. To bo odpravilo potrebno po lokalnem skladiščenju, vsi naši podatki bodo na voljo vedno in povsod, ter na najrazličnejših napravah. Seveda bodo tudi v tem času obstajale namizne aplikacije, ne bodo pa več zavzemale današnje vloge.

Vsem tistim profesionalnim projektnim managerjem, kateri so bili predstavljeni v raziskavah, ter kateri verjamejo, da obstajajo boljše rešitve na trgu, je pomembno reči da se trgi in njegova

programska oprema hitro spreminja. Postaja vse bolj dostopna in vedno bolj pisana na kožo potrebam uporabnikov. Ni več samo kopij MS Projecta, kot je bila to navada v preteklosti, ampak prihajajo na trg nove rešitve. Sodelovanje je v srcu teh rešitve, kot tudi splet 2.0, kateri celo opisuje svojo usmeritev projektne managementa 2.0 kot prihodnost.

Treba je povzeti, ob vsem tem analiziranju programske opreme danes, da se trg širi in večja ob enem. Občutek danes je verjetno takšen, kot je bil ob začetku obdobja osebnih računalnikov, ko so vse te nove aplikacije prihajale na to novo platformo. Ni očitnega zmagovalca med našimi predstavljenimi rešitvami, koristi so enostransko na strani uporabnikov. Spisek katerega sem predstavil je samo trenutna slika, saj bodo na trg prišle sčasoma nove in boljše rešitve, od obstoječih ponudnikov, ter tudi novih.

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