The ERP System for an Effective Management of a Small Software Company – Requirements Analysis

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Abstract: As found out by a questionnaire survey a significant part of small software companies is not satisfied with the way their company processes are supported by software systems. To change this situation it is necessary first to specify requirements for such software systems in small software companies. Based on the analysis of the literature and the market and own experience the first version of the ERP system requirements specification for small software companies was framed and subsequently validated by interviewing the executives of the target group companies.

Keywords: ERP for a small software company, information system for a small software company, software development process, software process improvement, small software company, requirements analysis, user stories

1. Introduction

Although much attention has recently been devoted to the topic of software engineering, the results of published surveys show that a significant number of software projects is not successful. Ambler (2011) states that the ratio of successful software projects ranges to 60% while the rest is categorized as challenged or failed. Overall, researchers' effort worldwide concentrates rather on software development methodologies and practices than on other areas of company processes. There is a lack of comprehensive endeavor to look at an operation of a software company as a whole. The research (VersionOne 2012) brought up a desire of more frequent use of management tools in small software companies as an important way of future development.

Considering all of the facts stated above, we identified a potential for improvement. The topic of software systems completely supporting the operation of software companies is not widely examined in literature. Most of the resources focus only on the particular topic of software development, not on the operation of a software company as a whole. Nevertheless, the concept of Application Lifecycle Management described e.g. in (Rossman 2010), and process improvement frameworks as e.g. CMMI (Software Engineering Institute 2011) try to approach a software company as an inseparable piece. Even further goes Nalbant (2004) who focuses on designing an information system to streamline software development process in software companies. However, the depth of this paper is not sufficient and thus can rather be used as a basis for further work.

Although there are many software development methodologies and practices, they do not solve the problems as a matter of fact for several reasons. In particular:

- SW development methodologies focus in most cases only on the area of software development itself; they do not provide any complex view of the overall operation within a company. However, this approach does not fulfill the needs of a software company which also requires linking its development with invoicing, remuneration of employees, training, customer relationship management, etc.

- There is a lack of suitable software systems that properly facilitate an introduction and usage of SW development methodology while allowing a complete control of major areas of a company's life.

For the purpose of our research relevant software tools can be divided into two categories based on (Nalbant 2004):

- CASE tools that support and automate relatively independent software engineering activities (design, programming, testing),

- information (ERP) systems whose goal is to manage and integrate various activities in software development, in particular through:

- o information sharing and consolidation,
- o automation of a number of activities in a software company,
- o provision of mechanisms for planning, management and evaluation of software processes.

Software development processes are closely related to such areas like project management, human resources, finance and quality management. Thus, to make an overall improvement of software development processes, there is a need to focus on these related processes. ERP system should include such an approach and automate and / or improve these processes. The relationship of an ERP system and software processes is shown in Fig. 1.
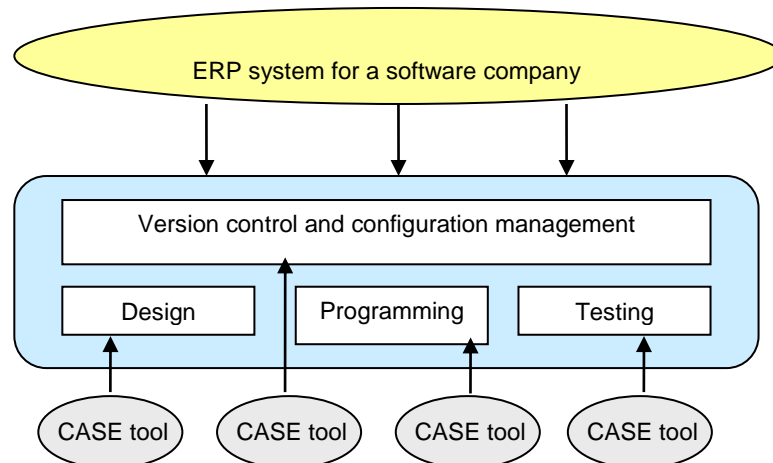

Fig. 1: Relationship of an ERP system, SW processes and CASE tools, based on *(Nalbant 2004)*

While CASE tools allow an effective implementation of particular development processes, e.g. programming, testing, version control and configuration management, the ERP system integrates all these processes into a single environment with shared information. Pursuant the literature search, the market analysis and the number of discussions with people from the target group we haven't found any comprehensive tool. That is why we are first going to specify the requirements for the ERP system, which will optimally support the processes of the small software company. Further work will include the development of the ERP system and its implementation in real companies. For the implementation in a small company, a simplified version of the accelerated ERP methodology (Yilmaz, Ozcan, 2011) will be applied.

The paper is organized as follows. In the introduction the current situation in the field of software development is presented. In the second section, the target group of companies and the key roles are specified. This is followed by a brief summary of the questionnaire survey results to validate the need of the company to deal with this area. The main part of the article is focused on the first version of functional requirements specification for the ERP system, which is subsequently validated by interviews in real companies.

2. Target Group Specification and Analysis

2.1 Company Size

As mentioned above, this paper concentrates on small software companies. When defining the target group of small companies, several methodologies were considered. Pursuant to Czech Act No. 47/2002 Coll. based on the EU legislation, a small company is understood as the one that has fewer than 50 employees. According to the working group WG24 of the ISO / IEC JTC 1 SC7 very small companies are companies having fewer than 25 employees (Laporte 2007). The EU definition is not clearly applicable for the field of software development, as this field is a knowledge intensive sector, where 50 employees mean quite a high number at least in the case of the Czech Republic. Thus, we decided to use the WG24 definition and for the purposes of this paper small companies are considered as those with fewer than 25 employees.

2.2 Roles of Persons in the Company

In each company employees are performing different roles with various needs. The designation of the roles is based on the OpenUP methodology (Open Unified Process 2012) that defines following roles: the analyst, the architect, the developer, the project manager, the stakeholder and the tester. In terms of ERP system requirements the individual employees in the field of software development do not significantly differ, therefore the role of the analyst, the architect and the developer will be brought together to the role of "the developer". To satisfy the requirements of the company owners, the role of "the owner" will be added to the before mentioned roles.

Therefore the requirements are defined for the roles of *the developer*, *the project manager*, *the stakeholder* and *the owner*. For each role there are prepared user stories that ought to be supported for it.

2.3 Key Process Areas

As stated above, every software company needs more than a pure software development for its overall operation. It is bound to deal with planning and managing projects, organizing work, recruiting, managing and rewarding employees, managing its finances and invoicing, ensuring knowledge transfer between employees, managing work quality, etc. To analyze the requirements for the ERP system properly, key process areas crucial for a software company were identified based on (Nalbant 2004). The model is shown in Fig. 2.
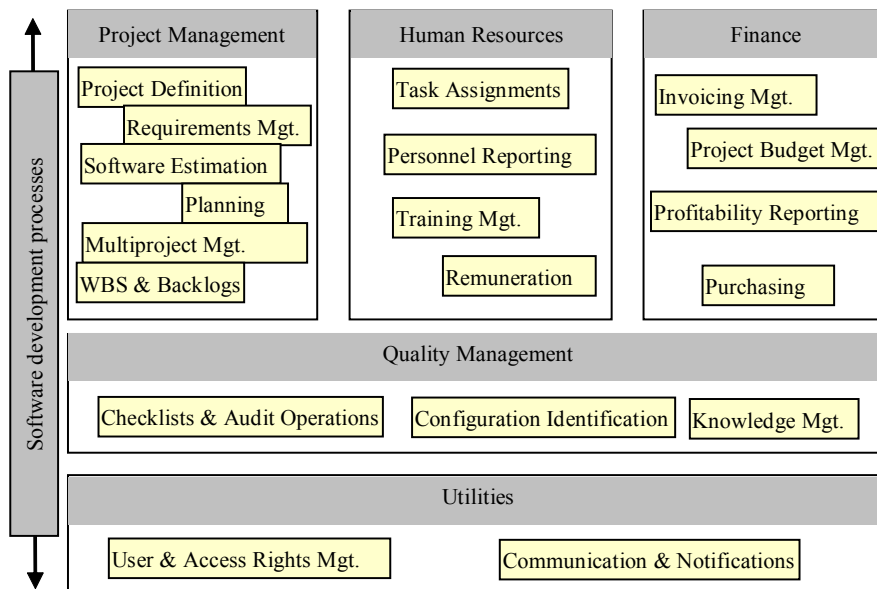

Fig. 2: Key Company Process Areas, based on *(Nalbant 2004)*

3. Results of the Questionnaire Survey

To find out the current status of using software tools in small companies a questionnaire survey was conducted on the WebExpo 2011 conference. The conference was hold from 22nd to 24th September 2011 at Prague and the attendance exceeded 1000 visitors mainly from small to medium size companies dealing with software development. The visitors received the printed out questionnaire as well as one in the electronic form. In total we had 108 respondents.

The questionnaire contained several parts focused on software development methodologies and practices and the support of the processes made by software systems. According to the goal of this paper the key question is "*Does your company support the following areas of processes by suitable software systems?*" There were defined areas of company processes based on the model in Fig. 2 as possible answers for this question. The respondents selected in each area to what extent they are satisfied with the support by software systems within their company by answering one of following: "*Yes, to the full satisfaction*", "*Yes, but we would like to achieve an improvement*", "*No, but we feel the need*", "*No, we do not feel any need*".

61 respondents from the segment of small companies participated in this question. Fig. 3 presents the overall scope of support of company processes by software systems. To interpret the chart in Fig. 3, it is meaningful to sum up the values "No, but we feel the need" and "Yes, but we would like to achieve an improvement", since these values represent the ratio of respondents who wish to make an improvement in supporting their company processes.

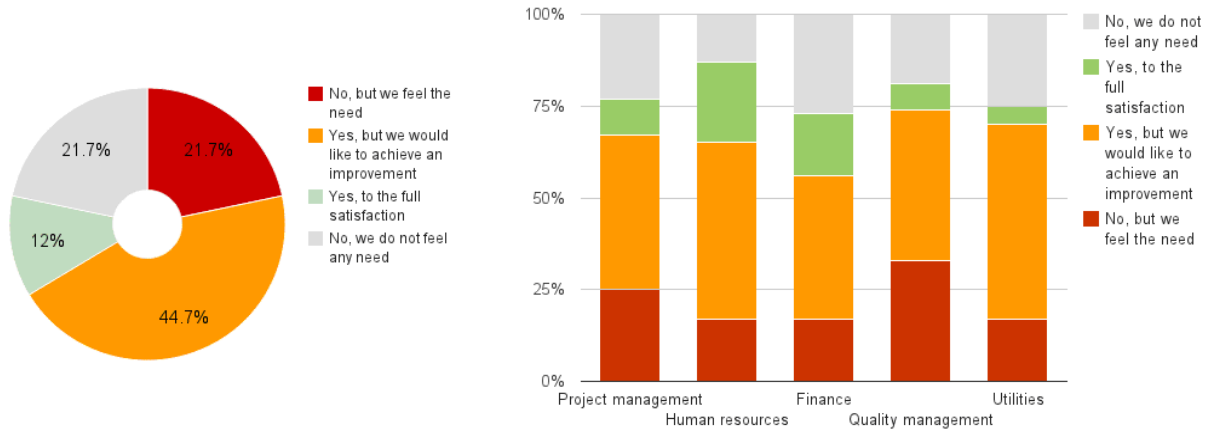**Support of Company Processes by Software Systems**

Fig. 3: Support of company processes by software systems

It is evident from the Fig. 3 that two thirds of the respondents are not satisfied with the current situation within their company and would like to achieve an improvement. More than a fifth of the respondents do not have their processes supported by software systems but do feel the need to do so. The Fig. 3 depicts also the detailed view in individual areas of company processes.

Another important question in the survey was: "*Do you think that it is possible to improve the processes of software development in your company by using suitable software development methodologies, practices and software systems?*" The respondents selected from "yes" or "no" answer. This question was included to verify our presumption that companies think that the improvement can be achieved using suitable methodologies, practices and software system. The vast majority of respondents think that software processes in their company can be improved by using suitable software development methodologies, practices and software systems, as seen in Fig 4.
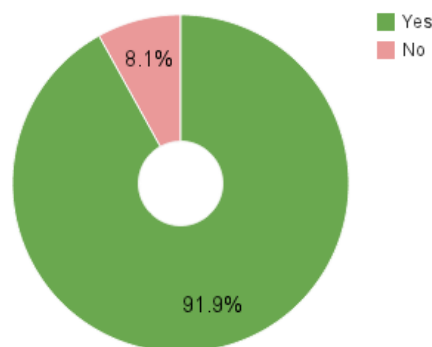

Fig. 4: Improvement possibilities of software development processes

It is crucial for an upcoming change of company's approach to their processes being supported by software systems that companies are convinced that using a good methodology, practices and software system can lead to an overall improvement of their functioning.

3.1 Conclusion of the Results of the Questionnaire Survey

The questionnaire survey conducted at the WebExpo 2011 conference clearly responded the question whether it makes sense to address the issue of the support of processes in small software companies with appropriate software tools.

4. Specification of the ERP System Requirements for a Small Software Company

The specification of the ERP system requirements for a small software company is based on business requirements that were determined by the analysis of the functionality of existing tools, by the analysis of the literature and by our own experience. In the initial version of the requirements specification there are also included requirements based on selected principles and practices of different methodologies (Scrum, Kanban). The specification was subsequently validated by qualitative research (the interview).

To express the functional requirement specification, a method of user stories was chosen because it is usually used for the expression of the functional requirements in agile approaches. Their advantage is in good comprehension for the user and obvious benefit of each requirement, because they correspond to the structure „As a <role>, I want <goal/desire> so that <benefit>". Further, the priority (1 – must, 2 - should, 3 - could) was assigned to each story.

The initial version of the ERP system functionality was based on the analysis of the functionality of various tools, which are currently used in the software development area, especially Rational Team Concert, VersionOne, Pivotal Tracker, BaseCamp, 5PM or EasyProject. Anyway, none of these tools supports all required areas as shown at the Fig. 2. The key goal was to extend the requirements in terms of overall operation of the company resulting from this figure.

For each defined role and the area of processes we made up user stories that ought to be supported by the ERP system. The Tab. 1 contains the list of the user stories for the key process areas and their priority.

Tab. 1: User stories for the key process areas

ID	Project Management	Priority
PM01	As a *project manager* I want to create a project including information about the stakeholder, the budget, partial fees and charges and a charged unit of labor so that I could assign tasks to the project and plan iterations.	1
PM02	As a *project manager* I want to manage the project functional requirements (backlog) through tasks like WBS, including estimation of effort and fixed prices so that I would have an overview of the overall scope of the project in one place. The backlog item can be divided into subtasks.	1
PM03	As a *project manager* I want to manage the list of non-functional requirements so that nothing important would be forgotten during the development.	2
PM04	As a *project manager* I want to create a project plan based on specification of requirements so that the project could be developed by increments. Individual tasks (or user stories) will be shifted from backlog to iterations (sprints); special emphasis should be placed on the possibility of simple choice of tasks for the current iteration.	1
PM05	As a *project manager* in each project I want to see necessary working hours for individual roles based on WBS and iterations so that I could plan the allocation of human resources. By these roles I want to see the Gantt chart for the estimation of deadline feasibility for all projects together, for just one project or for one role/worker.	2
PM06	As a *project manager* I want to be able to export / copy requirements specification and project plan as a picture or better as a table so that I can e.g. insert it into the proposal document.	2
PM07	As a *project manager* I want to be able to create a project template from which it can be generated new projects with basic tasks for each role, so that the recurring tasks wouldn't have to be manually created over and over.	3

PM08	As a *project manager* I want the appropriate method of accounting have set in the project so that the reports of work and the reports of projects profitability could be related to it. Some of the projects have a fixed price for the whole project, some of them for individual tasks and some have the price set according to the number of hours actually spent on it.	1
PM09	As a *project manager* I want to see the amount of remaining work on the project or iteration (burndown chart) so that I could quickly find out how is the project´s progress.	2
PM10	As a *project manager* I want the tasks to be connected with the repository of a version control system (e.g. SVN or Git) in order to trace which tasks or requirements caused which changes in the source code and vice versa.	3
PM11	As a *project manager*, at the task I want to set a related person or more; this person could be either responsible for the task or just be an observer.	1
PM12	As a *project manager* I want to set the deadline for the task and I want the system itself to notify on upcoming deadline by e-mail or text message.	2
PM13	As a *project manager* I want to set the type and the priority of the task to evaluate how much time and how many costs were spend on fixing errors and how much time the tasks focused on the application functionality took.	1
PM14	As a *project manager*, at the task I want to define that the number of hours must be first specified to finish and close the task so that the invoicing could be related to it.	1
PM15	As a *project manager* I want to see all the milestones and deadlines on the timeline so that it would be apparent what must be finished, on which project and when. I want to have an overview for all projects as well as for one project and one individual worker.	2
PM16	As a *project manager* I want to monitor the accuracy of effort estimates based on real statement of work so that I could make better estimates next time. I want to have the overview not only according to the project, but also to the type of tasks and to workers.	2
PM17	As a *stakeholder* I want to enter new request, task or complaint either directly to the system or by sending an e-mail to make sure it has been registered and would be solved.	2
PM18	As a *stakeholder* I want to be informed, which worker is responsible for my request, what is the date of making and what is the price for it to make sure the task will be dealt with.	2
PM19	As a *stakeholder* I want the history of communication to be available at my every ticket to be sure that everything is clear and traceable.	3
PM20	As an *owner* I want to see all projects and tasks in the system as well as the budget, price lists etc. so that I will be aware of everything. Concurrently I do not want the unauthorized workers to have access to it.	1
PM21	As an *owner* I want to register recurring services for each project (e.g. based on service contracts, renewals of domains, web hosting operations, etc.) including their prices and dates to be sure that everything is realized and/or invoiced. This can also be realized in the form of recurring tasks.	2
ID	**Human Resources**	**Priority**
HR01	As a *developer* I want to see the list of tasks regarding me and my projects so that I could focus on what I am currently dealing with. Other tasks should stay hidden.	1
HR02	As a *developer* I want to see my current tasks by the task board so that I could come to work and see what to expect on various projects and therefore minimize the amount of the work in progress.	2

HR03	As a *developer* I want to have one central place where I can assign what I have currently done and how much time I have spent working on it regardless of the specific project characteristic and the fact I am paid per hour, for the task or getting a fixed pay.	1
HR04	As a *project manager* I want to check how much labor has been done by which developers and on which projects so that I could evaluate and reward them.	1
HR05	As a *project manager* I want the externs to work on the project to make easier for other people to be involved in the project. They would have a limited access to the system.	2
HR06	As an *owner* I want to set different methods of remuneration and its amount for different workers so that some of them could be rewarded according to hours worked, some of them could get a fixed pay and some could be rewarded for the individual tasks.	1
HR07	As *any role* I want to work with my personal (non project) tasks so that I can have a single place that interconnects all my personal and business tasks during the day.	3
ID	**Finance**	**Priority**
FI01	As a *developer* I want once in a specified period (month) to get an overview based on my statement of work, where I could see the amount of the reward so that I would know what kind of work and how much of it I did.	1
FI02	As a *project manager* I want to set for each task if it is billable or not so that it would be possible to issue the invoice correctly for the customer.	1
FI03	As a *project manager* I want to review the report of work and on this review the invoice for the customer would be issued so that I could possibly correct the rounding of time and make other minor editing.	1
FI04	As a *stakeholder* I want see how many hours and how much money I will be charged for the specific period so that I could have a control over it.	2
FI05	As an *owner* I want to make sure that every work done would be invoiced so that I would not have to pay for some hours by myself because of some omission in the record.	1
FI06	As an *owner* I want to easily issue invoices for customers based on the amount of the work done to make sure the work would be paid. It also must be recorded what is already invoiced and what is not yet.	2
FI07	As an *owner* I want to be reminded to issue an invoice for recurring services (eg. according to service contract) to not lose the revenues.	2
FI08	As an *owner* I want to have ensured that every work done is relating to some project, it is determined how much I have to pay for it and who is going to pay me for it to make sure my funds are treated economically.	1
FI09	As an *owner* I want to see the profitability of the projects, thus how much individual projects cost and how much was invoiced for them so that I could focus on what brings us real value. Such overview I want to see also for individual workers.	2
FI10	As an *owner* I want the system to be connected with the accounting so that invoices can be paired with timesheets and projects.	3
ID	**Quality Management**	**Priority**
QA01	As a *project manager* I want to make checklists for different type of tasks so that we could improve the quality of the individual products. Items may have different priority.	1
QA02	As a *project manager* I want to add previously created checklist to the task or add a new one so that I would not have to create everything again. The developer at each task must go through this checklist and confirm it so that the task could be finished and closed.	1

QA03	As a *project manager* I want to make sure that the developer checked every available checklist before he finished the task so that the work is done in appropriate quality.	1
QA04	As a *project manager* I want the tasks to be linked with a version control system and a continuous integration server in order to check that all changes related to some task were done in adequate quality and properly tested.	3
QA05	As a *developer* I want to have checklists the most visible as possible right in the task so that I would be able to remember the items and realize them during my work at the task.	2
QA06	As *any role* I want to be able to share with other team members a link to an article or a video. This may include a checklist to be filled in order to confirm that the worker understood the document.	2
ID	**Utilities**	**Priority**
UT01	As an *owner* I want to administer users having the right to work with the system so that it would be ensured every person get the access only to its authorized area.	1
UT02	As *any role* I want a structured discussion in each project and task so that I would be able to communicate with others even if they are in distant places.	2
UT03	As *any role* I want to be notified (e.g. by e-mail) about important events so that I would be aware immediately of everything substantial without manual control.	1

5.   Requirements Specification Validation

The requirements specification was validated in real companies by individual interviews with executives. During the interview we were interested in understanding to which extent the initial version of the specification meets their needs, what do they consider as redundant and what do they miss.

To validate the specification we were cooperating with multiple Czech companies:

- Medio Interactive, s.r.o. (interviewed person Ing. Jan Tichý), which deals with software development,
- eBallance Creative s.r.o. (interviewed person Ing. Lukáš Burkoň), which deals with software development,
- Vergilio, s.r.o. (interviewed persons Ing. Štěpán Zikmund and Radek Netoušek), which deals with software development and development and operation of their own web projects,
- Wikidi a.s. (interviewed person Ing. Lukáš Burkoň), which deals development and operation of their own web projects.

All chosen companies belong to the target group and are specialized in software development. Moreover, these companies are both companies developing the custom-made software as well as companies developing their own software products.

A short introduction was written for the interview where purpose and goal was presented. The interview had semi-standardized form with the structure based on the initial version of the requirements specification. For each process area individual user stories were presented. After a discussion and our additional questions we evaluated each user story whether it meets the needs of given company ("yes"), whether they (companies) agree with it with minor objections ("yes, with objections") or whether they disagree ("no").

Each interview took from 1 hour to 2 hours and manager of the company participated in it. The date and the topic of the interview were settled with sufficient time for the companies to prepare for it. As far as half of the interviewed companies agreed with user stories, meaning that their reply was evaluated as "yes" or "yes, with objections", the user story was accepted for the specification.

If some requirements of the companies were not covered by the proposed user stories, we evaluated the possibilities of its generalization and usage in other companies and eventually we added it to the final specification.

Results of the user stories validation are included in Tab. 2.

Tab. 2: Results of the validation

User Story	Medio Interactive, s.r.o.	eBallance Creative s.r.o.	Vergilio, s.r.o.	Wikidi a.s.	Accepted
PM01	Yes	Yes	Yes	Yes, with objections	**Yes**
PM02	Yes	Yes	Yes	Yes	**Yes**
PM03	Yes	Yes	Yes	Yes	**Yes**
PM04	Yes	Yes	Yes	Yes	**Yes**
PM05	Yes	Yes	Yes, with objections	Yes	**Yes**
PM06	Yes, with objections	Yes, with objections	Yes	No	**Yes**
PM07	Yes	Yes	Yes	No	**Yes**
PM08	Yes	Yes	Yes	No	**Yes**
PM09	Yes, with objections	Yes, with objections	Yes	Yes, with objections	**Yes**
PM10	No	No	Yes	Yes	**Yes**
PM11	Yes	Yes	Yes	Yes	**Yes**
PM12	Yes	Yes	Yes	Yes	**Yes**
PM13	Yes	Yes	Yes	Yes	**Yes**
PM14	Yes	Yes	Yes	Yes	**Yes**
PM15	Yes	Yes	Yes	Yes	**Yes**
PM16	Yes	Yes	Yes	Yes	**Yes**
PM17	Yes	Yes	Yes	No	**Yes**
PM18	Yes	Yes	Yes	No	**Yes**
PM19	Yes	Yes	Yes	No	**Yes**
PM20	Yes	Yes	Yes	Yes	**Yes**
PM21	Yes, with objections	Yes	Yes	Yes	**Yes**
HR01	Yes	Yes	Yes	Yes	**Yes**
HR02	Yes	Yes	Yes	Yes	**Yes**
HR03	Yes	Yes	Yes	Yes	**Yes**
HR04	Yes	Yes	Yes	Yes	**Yes**
HR05	Yes	Yes, with objections	Yes	No	**Yes**
HR06	Yes, with objections	Yes	Yes	Yes	**Yes**
HR07	Yes, with objections	Yes, with objections	Yes	Yes, with objections	**Yes**
FI01	Yes	Yes	Yes	Yes	**Yes**
FI02	Yes	Yes	Yes	No	**Yes**
FI03	Yes	Yes	Yes	No	**Yes**
FI04	Yes	Yes, with objections	Yes	No	**Yes**
FI05	Yes	Yes	Yes	Yes, with objections	**Yes**
FI06	Yes	Yes	Yes	Yes, with objections	**Yes**

User Story	Medio Interactive, s.r.o.	eBallance Creative s.r.o.	Vergilio, s.r.o.	Wikidi a.s.	Accepted
FI07	Yes	Yes	Yes	No	**Yes**
FI08	Yes	Yes	Yes	Yes	**Yes**
FI09	Yes	Yes	Yes	Yes	**Yes**
FI10	Yes, with objections	Yes, with objections	Yes	No	**Yes**
QA01	Yes, with objections	Yes	Yes	Yes, with objections	**Yes**
QA02	Yes	Yes	Yes	Yes	**Yes**
QA03	Yes	Yes	Yes	Yes	**Yes**
QA04	Yes, with objections	Yes, with objections	Yes	Yes	**Yes**
QA05	Yes	Yes, with objections	Yes	Yes, with objections	**Yes**
QA06	No	Yes	Yes	Yes	**Yes**
UT01	Yes	Yes	Yes	Yes	**Yes**
UT02	Yes	Yes	Yes	Yes	**Yes**
UT03	Yes	Yes	Yes	Yes	**Yes**

By the validation of individual user stories we came to the conclusion that all user stories were accepted. At least half of the companies were in agreement for the involvement of each mentioned user story. Sometimes companies had an objective to the user story, nevertheless they fundamentally agreed with it and the user story in such form was acceptable for them.

The interviews also resulted in some requirements that were not included in the initial proposal:

- eBallance Creative s.r.o. would need to take into account in the finance module that some developers have a fixed selling price for a set period of time regardless of the specific tasks done,
- Vergilio, s.r.o. would need to store shared documents in a structured knowledge base,
- Vergilio, s.r.o. would like to have an overview of active discussions and recent changes in tasks and projects that would be displayed for each worker, like for example a wall on Facebook,
- Medio Interactive, s.r.o. would need to be able to set dependencies between tasks,
- Medio Interactive, s.r.o. would need to record holidays for workers and take into account the number of working days in a month for compiling financial reports,
- Medio Interactive, s.r.o. would need to have a knowledge base (e.g. by wiki), both for individual projects and in one central place,
- Medio Interactive, s.r.o. would like to have a functionality of a CRM tool in this system,
- Wikidi a.s. would like to see an overview of tasks at the dashboard with information of how long the tasks are there and in which state,
- Wikidi a.s. would need to be able to set up a reason of a delay at the task and for what circumstances it is actually waiting.

All these requirements were evaluated as meaningful and useful, so they were included into the final specification.

6. Final Version of the ERP System Requirements Specification for a Small Software Company

By the validation of the requirements specification it was discovered that all proposed user stories are meaningful and desired by companies and therefore will be included in the final specification.

Based on the suggestions of the interviews a few new user stories were added, as shown in Tab. 3.

Tab. 3: New user stories

ID	User Story	Priority
PM22	As a *project manager* I want to be able to set dependencies between tasks, so that I can better plan projects.	2
HR08	As a *project manager* I want to be able to record holidays of the employees, to be able to take into account the number of working days in their financial statements.	2
HR09	As a *project manager* I want to see for each task how long and in which state it is on the board of unfinished tasks to be able to solve any problems quickly.	1
HR10	As *any role* I want to be able to set up a reason of a delay at the task and record for what circumstances it is actually waiting, to be able to start working on another task.	1
FI11	As a *project manager* I want to be able to set up a selling price for the employee in a project for a certain period of time, to be able to issue invoices correctly and see corresponding financial statements.	2
QA07	As *any role* I want to be able to contribute to a structured knowledge base (e.g. in a form of a wiki) and search in it in order to share knowledge across the company. Knowledgebase can be maintained at the project level and for the whole company.	1
UT04	As *any role* I want to see the list of active discussions and recent changes in tasks and projects that concern me, so I always stay informed. The overview should be displayed for example in a form of Facebook wall.	2

The final version of the requirements specification therefore includes these requirements: PM01 - PM22, HR01 - HR10, FI01 - FI11, QA01 - QA07, UT01 - UT04.

7. Conclusion

By the questionnaire survey we found out that small software companies are not satisfied with the way their software development processes are supported by software systems. Pursuant the literature search, the market analysis and the number of discussions with people from the target group we haven't found any comprehensive tool. Therefore we wanted to specify requirements of the ERP system, which will optimally support the processes of the small software company.

First, we defined the target group of companies, the key roles and the key process areas that should be supported by the ERP system. For each role and process area we defined user stories that ought to be supported by the ERP system. We validated this specification in real companies by the interview with the executives. The validation showed relatively strong accordance in requests, therefore we consider assembled specification as beneficial and determinant. The validation will be further done in other companies.

This requirements specification is currently followed by the implementation of the first version of described ERP system. This system should be publicly available for testing purposes in the middle of 2014.

Acknowledgements

8. References

Ambler, S.W., 2009. *Agile Practices Survey Results: July 2009*. Ambysoft [online]. Available at: http://www.ambysoft.com/surveys/practices2009.html [Accessed 30 October 2013]

Ambler, S.W., 2011. 2011 *IT Project Success Rates Survey Results*. Ambysoft [online]. Available at: http://www.ambysoft.com/surveys/success2011.html [Accessed 14 October 2013]

Ambler, S.W., 2012. *Surveys Exploring The Current State of Information Technology Practices*. Ambysoft [online]. Available at: http://www.ambysoft.com/surveys/ [Accessed 11 November 2013]

Laporte, C., 2007. Applying International Software Engineering Standards in Very Small Enterprises. *CrossTalk – The Journal of Defense Software Engineering* Feb 2007, pp. 29-30

Nalbant, S., 2004. An Information System for Streamlining Software Development Process. *Turkish Journal of Electrical Engineering & Computer Sciences 12*, pp. 97–106

Open Unified Process, 2012. *Eclipse Process Framework Wiki* [online]. Available at: http://epf.eclipse.org/wikis/openup/ [Accessed 23 September 2013]

Rossman, B., 2010. *Application Lifecycle Management - Activities, Methodologies, Disciplines, Tools, Benefits, ALM Tools and Products*. Tebbo. ISBN 978-1742446646

Software Engineering Institute, 2011. *CMMI Version 1.3 Information Center*. Carnegie Mellon University [online]. Available at: http://www.sei.cmu.edu/cmmi/index.cfm [Accessed 7 November 2013]

VersionOne, 2013. *7th Annual State of Agile Development Survey*. VersionOne.com. Available at: http://www.versionone.com/pdf/7th-Annual-State-of-Agile-Development-Survey.pdf [Accessed 11 October 2013]

Yilmaz, Y., Ozcan G., 2011. Implementing ERP-systems with accelerated ERP more efficient and quickly – a best practice. *Journal of Systems Integration*, Vol 2, No 3, pp. 28-37

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