SOFTWARE PROCESS IMPROVEMENT IN LITHUANIA - AB ALNA CASE STUDY[1]

Gediminas Mikaliūnas, Martynas Reingardtas

Alna AB, Naugarduko St. 55a, LT- 03204 Vilnius, Lithuania

Abstract. This paper presents overview of software process improvement project in leading Lithuania IT company AB Alna. Company has started the software process improvement project in 2001 and reached the first milestone in 2004 by achieving Level 2 rating according to Capability Maturity Model v1.1. Software division was successfully certified according to official SEI CBA-IPI (Software Engineering Institute CMM®-Based Assessment for Internal Process Improvement) methodology. In this article a special attention is paid to the preparation of the company before starting the process improvement. There are listed potential risks that may stop the project in the middle throwing the investment away and hints how to overcome them. The brief overview of efforts required for such project is also provided.

Keywords: Software process, process model, process improvement, software process implementation, software process certification, CBA-IPI, IDEAL.

1. Indroduction

A number of studies have investigated various factors that affect software process improvement (SPI) programme, both from theoretical and practical perspective ([2, 6, 7]. There are also many reports from practitioners, reporting on successes and failures of software process improvement efforts at organization of various sizes ([8, 9]). Even though there are opinions that small organizations are condemned to fail when implementing software process models, such as CMM-SW, there are numerous studies, such as [7], that conclude that small organizations are able to implement software process improvement programmes as effectively as large organizations and in order to implement SPI at least as effectively as their large counterparts, small software organizations should capitalize on their relative strengths in employee participation and exploration of new knowledge.

In this paper we investigate the practical aspects of mature software process development and implementation in a commercial software development company of relatively small size. Standards like CMM [1], ISO 15504 [5] or CMMI [3] are providing the theoretical models and frameworks that are used to assess maturity of processes within company and define the maturity rating. This paper concentrates on practical questions and challenges facing the companies once they decide to start improvement.

2. Deployment strategy

AB „Alna" has chosen IDEAL [4] (Initiating Diagnosing Establishing Acting Leverage) methodology to run process improvement project. IDEAL defines clear, practical steps how to organize the project and has been used in many SPI projects (e.g. Ericsson [8]).

IDEAL advantages:

- Methodology was developed in relation with CMM standard;
- CMM and IDEAL are developed by SEI (Software Engineering Institute), so there are no inconsistencies between them;
- SEI is the major (based on competence and authority) source for process improvement based on CMM standard.

IDEAL defines five steps of the improvement project (or process):

- **Initiation**. The start of improvement. During this phase the infrastructure is created, roles and responsibilities are defined, resources to run the program are dedicated and process improvement program goals are defined.
- **Diagnosing**. This is the major phase, because the results of it define the shape of next phases. During this phase process is assessed, CMM rating is defined, results are documented and proposal is prepared how to improve the process. Proposal includes recommendations, project plan. Process

improvement goals are defined based on strategic vision and goals of organization. Process improvement goals should be aligned directly with business goals.

- **Establishing**. During this phase the strategic process improvement plan of activities is developed. This plan includes concrete and measurable process improvement goals (e.g. shorten time to finish the projects by 10%).
- **Acting**. During this phase the execution of activities defined in process improvement plan is done. The new processes are created, existing ones are improved and new baseline of processes is deployed, people are trained and start using the new processes.
- **Leverage**. This phase is dedicated to evaluate the process improvement project. The report is created about achieved results: what are the practical results, is infrastructure adequate, etc. During this phase the plans, strategy, objectives and goals are reviewed and decisions about next phases are done.

3. Choosing the right strategy for improvement

The company has to choose between evolutional and revolution way of improvement.

Evolutional way, which was chosen in our company, defines a step-by-step running improvement project. This type of project involves many people from the company. Teams are defining procedures, policies and templates thus taking into account very broad pool of company knowledge. All the best and the worst

practices are accumulated into the new process. Clear advantage of this process is that people who have created the process feel committed and motivated to execute based on it.

The disadvantage of evolutionary model is that it requires much more effort and time investments. Our experience show that even such a simple task like getting all critical project managers into the meeting at once in the bigger organization becomes a difficult task.

The other, revolutionary way, takes approach where few selected people from the company define all changes to the process and define a plan implementation of it. This way requires much less investment but the risk to face resistance to change is much higher. The culture of the company has big impact in choosing between these two ways. If specialists are used to get commands from upper management then risk to get resistance to change is less. For such a company revolution way may be a good way to perform the process improvement. If the company has more democratic culture, where people at all levels are encouraged to take decisions, then revolution way may be too risky. People are used to work in they own way and introducing new ones may be a very challenging task.

4. Schedule and resources

In Table 1 there is a schedule of process improvement project. This schedule defines all major project milestones.

Table 1. Process improvement milestones

Date	Phase
2001 1st December	Process improvement project started. CMM chosen as framework.
2002 10th May	Assessment according 2nd and 3rd level of CMM.
2002 30th May	Strategic process improvement plan created.
2002 4th June	Process creation and documentation phase started.
2003 3rd February	Process testing phase started.
2003 2nd June	Process implementation started.
2003 16th June	New process policies officially approved. This day announced as the "CMM Constitution Day".
2003 1st September	Process evaluation started. Intensive schedule of internal audits and seminars. Continuing process deployment phase.
2003 15th December	Preparation to certify for CMM 2nd level.
2004 1st May	Pre-certification audit takes place. The plan is created how to satisfy the requirements of level 2nd.
2004 2nd November	Certification audit takes place. Auditor rates processes and projects compliant with CMM 2nd level requirements.

Figure 1 resource distribution represents how efforts are distributed between phases of process improvement project. The biggest phase in our case is process creation. Testing and deployment take about the

same effort. Smallest is evaluation phase. All these phases together can be mapped to "Acting" in IDEAL model.
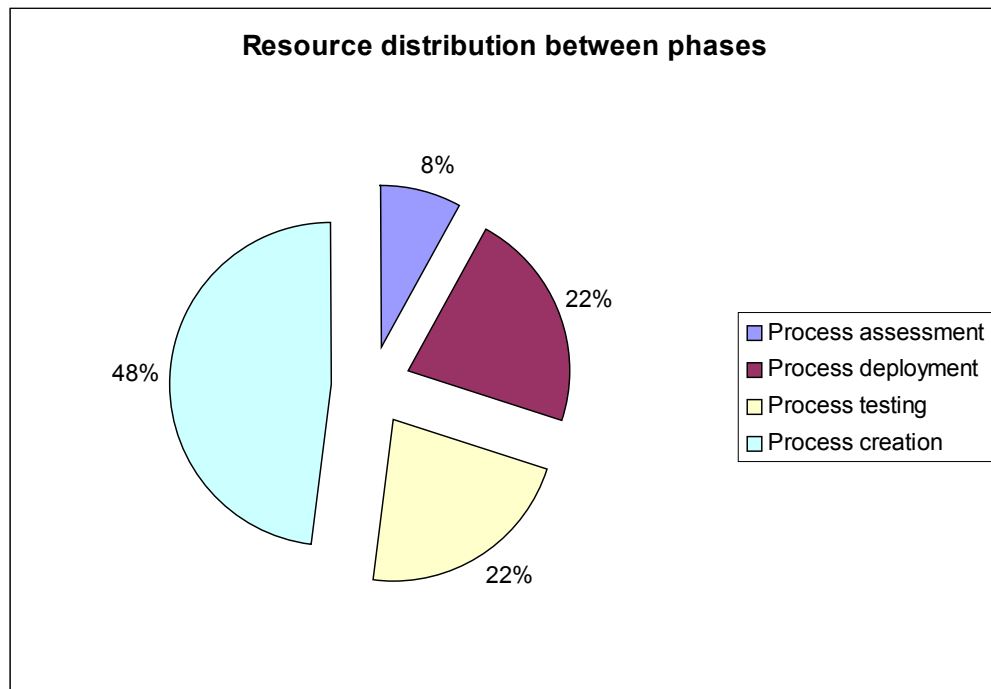
Figure 2. Resource distribution

5. Lessons learnt

Our experiences with the SPI initiatives offered several lessons about how organizations can more successfully manage SPI.

Based on our experience, the first recommendation for those who start process improvement is to get full support and commitment from company top management. Process improvement requires extra efforts from the company: trainings, changes to the daily work and habits, even relations with customers. All this cannot be achieved without support and understanding from top management. Support is also needed because the first results do not come up very soon. Good communication about the improvement project progress among employees and managers is very crucial.

At the same time Process improvement goals must be aligned directly with business goals. This allows getting top management buy-in and also narrows focus on the key areas of software process improvement programme.

The second recommendation – to arrange and run the process improvement activities like internal company project. This project like any other should have project plan with identified milestones and risks, it has to be monitored and controlled, there has to be contain dedicated resources assigned for it. One very common failure of the process improvement project is when the other projects get higher priority. Suddenly it may appear that short-term goals to earn money now is more important and risk to freeze or even fail process improvement gets very high.

Process improvement can also be started relying on enthusiasm of key people, there might even start an established team of people who sacrifices they spare time for this, but usually enthusiasm disappears faster than first results are achieved. We recommend dedicating at least one full time person (for company about 60 people) for the project. The rest of the team should have clearly defined goals, responsibilities and time has to be allocated.

The third recommendation is to gather those people into project team that will be users of the process: managers, project managers, senior developers and testers. Process change project is touching so many daily activities, and it is common to every human to resist to change. So if the people will define the change by themselves it will minimize the risk of resistance.

It is also worth mentioning that the implementation of process improvement model should depend on the culture of the company and improvement programme should be defined taking into account likely behavior of project participants and the rest employees.

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