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Bring in Knowledge through a Routine Framework in an Electronic Process Bundle

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Abstract— A key leverage for small software consultancy companies is the collective knowledge possessed by their consultants. There have been some studies in the literature on how to produce and transfer this knowledge, but most studies are aimed at large multinational corporations in Vijayawad. In this paper we describe an ongoing research project, aimed at improving knowledge sharing in a small software consultancy company through the use of a method framework in an electronic process steer coupled with an experience repository

I. INTRODUCTION

Small software consultancy companies have to leverage their position in the market to stay ahead of their competitors. One way to achieve this is by providing their customers with tailored solutions to their problems. They can do this by drawing upon the collective knowledge of their consultants.

When the company is small and the consultants are spread over the sites of many customers, it becomes difficult to gain access to and draw upon the collective experience of all the co-workers. Consequently the solutions provided by the consultants might not be of sufficient quality to make their customers return to the company when they need consultants for a new project. One solution to the problem with a dispersed workforce is experience repositories. A lot of research has gone into this field, however most of this research has been focused on large companies and little data exists on the application of this in small companies [1, 2]. In [3] the authors examine challenges facing small businesses when implementing knowledge management efforts. Small businesses are particularly vulnerable to knowledge erosion, yet they seldom have the time and resources needed to implement the knowledge management programs described for larger companies. However, we suggest that small businesses can benefit just as much from well thought out knowledge management efforts.

According to [1], which describes the successful use of an experience repository in a small software company, detailed data on its use and structure can be used to better understand how experience supports activities in the company. This can in turn lead to improvements in experience management concepts, techniques and tools. In this research report we describe our work in a small software consultancy company that wish to manage their knowledge through a method framework implemented in an Electronic Process Guide (EPG) coupled with an Experience Repository (ER).

II. CONTEXT

The company we investigated currently has 17 employees. Their main activities are hiring out consultants as developers, developing complete solutions for customers and hiring out consultants as advisors for selecting technology, strategy or process. Typically, no more than four to five consultants are at any time working for the same customer. The managers of the company wish to leverage the company in the market by providing solutions to the problems of their customers. The solutions should make them stand out and increase the probability that the customers later returns with new projects. In order to do this, they wish to foster an environment were all ideas and knowledge are shared freely among the employees, and where the employees can draw upon the experience of each other to provide good services to their customers.

This work is difficult since a lot of the employees at any given time are out at the site of customers where they don't have direct access to their colleagues. To remedy this situation they wish to collect the experience of their employees in an Experience Repository (ER). This will allow their employees to have easy access to the experience of their co-workers.

III. METHOD

Due to the cooperative nature of this research project, we decided to adopt action research as our approach. The most prevalent description of action research is found in [4]. The approach requires the establishment of a client system

infrastructure or research environment. In our case this was already taken care of through the researchers' and company's involvement in a mutual research program. The approach further specifies five identifiable phases, which are iterated: diagnosing, action planning, action taking, evaluating and specifying learning. This paper sums up our work and findings from the initial phases and what effect this has had on the development of the new tool. The plans for the next phases are outlined up in section 6: Future work.

For the initial diagnosing phase, we decided to use semi structured interviews. We scheduled interviews with 12 of the employees. The interviews were carried out using an interview guide. Basically we wanted answers to three questions: What was the current approach to knowledge sharing, what should the new tool contain, and what kind of functionality should it provide? All of the interviews were taped using a Dictaphone and were subsequently transcribed. The material was then coded and analyzed using the constant comparison method and the NVivo tool [5]. The problem with the adopted approach is that our results will be difficult to generalize due to our single case. Rather they will contribute to the understanding of the concepts of Experience Repositories. If the results from our study should coincide with the research literature some generalization might be possible.

IV. Interview Results

The company seemed to have a good environment for informal sharing of experience in that people knew one another and knew whom to contact if they were stuck. There did not seem to be much formal gathering of experience. If experience from a project was collected, it was mostly done in an ad hoc manner, and it was not easily available. The gathering of experiences today was mostly done through private initiative and saved for personal use. Lately a few employees had begun using post mortem analysis at the end of their projects, but they did not have a place to structure and access this information. The fact that a lot of work was done at the site of customers was also seen as a hindrance to collecting project experience. It seemed to be easier to get help with technical problems than problems related to process.

More structure and information related to process was seen as desirable. When asked about what information they wanted the new tool to contain, the employees provided us with a myriad of elements. A few, however, was mentioned more often than the others: document templates, patterns, a good process, help with customer relations and practical experience. Document templates were seen as potential help to increase productivity. Both inexperienced and experienced project managers saw a benefit from having a set of standardized templates in order to save time on documentation. Patterns were also mentioned as something that should be readily available. Good ideas and smart solutions that other people had thought of were worth repeating. However, the employees stressed the need for trust. It was important for them to know that a pattern could actually deliver what it promised.

A good development process and the need for help with questions related to process were often mentioned during the interviews. This need was considered especially important for the start-up of new projects. Inexperienced project managers expressed a need for a process that would help and guide them through the initial phases. Experienced managers expressed the need for a process that would help them keep on track throughout the project. A well-defined process was also seen as something they could market to their customers to gain an edge over their competitors. The employees often mentioned the need for guidelines and advice on how to improve customer relations. There was a broad agreement that more customer involvement would enhance the quality of the end product. The employees agreed that there had not been a lot of focus on this in the past and that guidelines for this would be most welcome in the new method framework. When it came to choosing a process, a template or a pattern, the employees would like to know what kind of experience others had made when using these items. They saw a great potential in linking the experience of the company's developers to templates, patterns and processes, in order to be able to assess them for their own projects based on their colleagues' experience.

V. Initial work and Challenges ahead

After the initial interviews we moved on to the action-planning phase of our research. This phase consisted of meetings with the company where we presented the result of our interviews. The interviews indicated that there was a demand for a tool that would help the employees to share and structure their experience, especially experience surrounding the development process. It also indicated that the culture of the company supported free sharing of information and experience, and that the employees saw the benefits of using such a tool as the management was suggesting. With the support from the employees established, we arranged a discussion on the functionality and the content of the new tool. It was decided that the company should develop an empty method framework tailored to the development process of the company. This framework would be implemented in a dynamic EPG, which would then be coupled to an ER. The employees would use this tool to enter their experience related to roles, artifacts and activities.

The goal is to create a process guide based on the collective experience of all the employees in the company, which can then be used to increase the quality and consistency of their work. Both the decision to couple the ER to the process of an

EPG and making the tool highly interactive to enable fast feedback is supported by which describes good practices regarding ER and [2] which describes a successful implementation of an EPG/ER After the meeting where this was discussed, we moved on to the action-taking part of our research. The company put one consultant on the project of working out a method framework. The framework was based on the Rational Unified Process (RUP), and was tailored to the company's process. During this process the input of both employees and scientists was sought in order to make the framework as similar to the current practice as possible. One of our main challenges in the time ahead will be to keep the ER alive. An ER that is not used by the developers is of no value to the company. Experience from other ER initiatives has shown that there are three factors that influence the use of an ER The ER must contain a minimum amount of experiences that can be searched. The amount of experience available is critical. If there is little experience available in the ER, the developers will neither use it nor contribute their own experiences to it.

•The experience that is found must be considered to be relevant for the developers in their day-to-day work. It must help them to do a better job and it must be up to date. One of the most demotivating things that can occur when using an ER is to find an experience with and interesting title but with outdated contents.

•It must be possible to establish a community of practice based on the ER contents. This means that not only must the experience be relevant – it must be possible to discuss, and augment existing experiences, that is; the ER must work as a forum where people can exchange ideas. All of these mechanisms are used to keep up the interest for the ER among the developers. On the other hand, the interest can only be kept if the content is good. In order to meet these challenges we will use several strategies. The most important mechanisms to achieve our goals are to keep the ER open. As a consequence of this, everybody can add his or her own experiences. There will only be one restriction – all input must be traceable to the person that contributed it. Build discussion treads. These are important both to keep the experiences up-to date and to keep the community of practice alive.

VI. Future Work

When the framework is finished and implemented in the EPG/ER tool it will be presented to the employees. After this, the employees will enter into a period of filling up the framework with relevant experience. The next challenge for the scientists will be to come up with good methods for extracting most of the experience of the employees in a way that is not too intrusive to the regular work of the company, yet still captures the most crucial knowledge. After an initial trial period the tool will be approved for use in projects. The role of the scientists then switches to an observational role. We plan on following the use of the EPG/ER for two years. By collecting information along the way and comparing it with the research literature, we hope to be able to ascertain how successful the knowledge initiative has been for the company and how it might apply to companies in similar contexts.

VII. References

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