The EKP approach to building organisational memories - experiences from two EU projects

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Abstract: A pattern based approach to building Organisational Memories, EKP, has been developed, applied and evaluated throughout a number of EU funded research projects, most recently in the ELEKTRA and HyperKnowledge projects. This paper provides an overview of the evaluation results.

1 Introduction

Change processes in modern organisations are knowledge driven. It is therefore that managing experience, competence, knowledge about business processes, organisational practices, and best business practices is so important. This knowledge is part of the Organisational Memory.

A pattern based approach to building Organisational Memories called Enterprise Knowledge Patterns (EKP) [1] has during the last decade been developed by collaborating research groups from the Royal Institute of Technology (KTH), Sweden, University of Paris 1, France, and UMIST, UK. The most recent version of the approach has been developed and applied in the Framework 4 projects ELEKTRA – "*Electrical Enterprise Knowledge for TRansforming Applications*"[1] No 22927 and HyperBank "*High Performance Banking*"[2] No 22693 and in the Framework 5 project Hypermedia and Pattern Based Knowledge Management for Smart Organisations (HyperKnowledge[3]) [2]. Its main components are as follows:

1. A set of models to be used for structuring and representing organisational knowledge. This modelling approach is called EKD - Enterprise Knowledge Development [1, 3].
2. A set of guidelines for conducting the knowledge acquisition and representation process. This process is considered to be strongly participatory.
3. Support for reusing existing knowledge, business designs and enterprise models in the form of *organisational patterns,* which are *generic, adaptable and reusable organisational design proposals*. Each pattern couples a problem with a solution, reflecting the context and the way in which the pattern can be applied.

In the ELEKTRA and HyperKnowledge projects the EKP approach was applied to extensive real life cases, which all have been thoroughly evaluated [4, 5]. The aim of this paper is to provide an overview of the evaluation results and to reflect on the

[1] Information available on http://www.dsv.su.se/~js/elektra.html
[2] Information available on http://www.dsv.su.se/research/syslab/Projects/HYPERBANK/hyperbank.html
[3] The HyperKnowledge Consortium is not associated or affiliated with Logical Water Limited or any of its products.

accumulated experiences gained. We also capitalise on the experiences by suggesting improvements to the EKP approach. The application cases carried out in the ELEKTRA and HyperKnowledge projects respectively are outlined in Section 2. Section 3 presents the more prominent results from both projects and discusses possible improvements of the EKP approach building on these results. Finally, Section 4 gives some conclusions and discusses future outlook.

2 Application cases in the ELEKTRA and HyperKnowledge projects

During the two projects the EKP approach was applied to a number of domains. In the ELEKTRA project we targeted electricity supply industry (ESI), focusing on electricity distribution and human resource management. In the HyperKnowledge project we continued targeting the ESI sector again also involved a public organisation, a municipality. The main focus was risk management of project proposals and management of large damages in power plants for the electricity company. In the public organisation the target domains were school administration, drug abuse prevention, traffic administration, real estate administration and municipal police. As can be seen, the two projects covered a number of very different domains, which should give some indication of the general applicability of the approach.

In the ELEKTRA project, the main drivers of modelling and pattern development were the researchers, who also developed the approach. In the HyperKnowledge project the modellers and pattern developers were domain experts who had been assigned the task as part of their ordinary work-load. None of the domain experts had previous experience in modelling or pattern building.

So far, two approaches have been tested to store and retrieve patterns. In the ELEKTRA project the patterns were stored in HTML documents and made available through the web (see e.g. http://www.dsv.su.se/~danny/patternlibrary/main.html). Pattern users would search and retrieve patterns through a "map" of related patterns within a specific domain. In the HyperKnowledge project the RETH tool [6, 7] developed by Siemens AG Österreich, Austria was used. The tool represents textual objects and their relationships, including attributes, and makes use of hypertext functionality and multimedia objects, such as sound and video. Another useful feature of the tool is that the knowledge repository contents can be automatically exported into a Web representation and thus be made available for a larger knowledge networking community.

3 Evaluation results

The evaluation methods employed in the ELEKTRA and the HyperKnowledge projects are more or less the same, building on the ELEKTRA evaluation as reported in [4, 5]. The main evaluation results are presented following four themes.

The Knowledge Repositories

Most users regarded the developed pattern repositories as useful, although some users had difficulties to grasp their purpose and usefulness. This should be made explicit and easy to locate in the repository.

Patterns should describe concrete solutions instead of guidelines and suggestions on how to tackle the problem in general. The evaluators frequently expressed an

opinion that the abstraction level is inappropriate for the kind of problem that is solved. Patterns describing alternative solutions should have guidelines for choosing an appropriate solution depending on a particular situation in organisation. EKD models and schemas were generally appreciated as explanations and clarifications of the proposed solutions.

Patterns in clusters are easier to understand and are therefore more appreciated than isolated patterns. The pattern clusters present broader and therefore more complete solutions. However, the structure of patterns was sometimes regarded as too complex or too difficult to grasp. Users should therefore be provided with a good overview of the repository contents. More explicit guidelines how to organise hyperlinks in the repository should be provided.

Some patterns used words and terms that had different meaning to the evaluators, which created additional confusion. Language and cultural differences should therefore be taken into account.

The language used to express the knowledge

Most evaluators considered the language – the pattern template and the way patterns were structured in the repository – to be useful for conveying reusable knowledge. Some evaluators found the richness of the pattern template somewhat confusing in that several fields seemed overlapping to them. This requires two types of measures, a reduction of the template and a clarification as to the semantics of the remaining fields. Some fields were considered more relevant than others, such as Problem, Context, Solution and Forces. As indicated by the fact that they are in general reasonably well elaborated in the patterns, these fields appear to be central.

Although the pattern template has been revised between the two projects, the transfer of the responsibility to develop patterns from researchers to domain experts has demonstrated the need for still more refinements and method guidance for pattern development process.

Tool support for storing and retrieving patterns

In the HyperKnowledge project the RETH tool was used to organise and store patterns and the web export of the tool for searching and retrieving patterns. Compared to the purely html-based solution used in ELEKTRA the use of the RETH tool was a considerable improvement, particularly when it comes to including different models and multi-media files in the patterns and also for updating the knowledge repository and linking to other patterns or sources.

The pattern development process

Observing the domain experts in the HyperKnowledge project use the EKP approach was useful. It showed that modelling is inherently difficult. The quality of constructed models in terms of their usefulness and understandability is one aspect of this. Extensive experience is needed to produce useful and understandable models.

Most participants became convinced of the advantages of participative modelling as the projects progressed, and a few were even exited about the results. Participative modelling sessions seems to be time-consuming. However, previous approaches of one person writing something down and having it reviewed by others are time-consuming as well. The difference being that in participative modelling the time spent by each participant is visible because it is scheduled.

Participative modelling sessions are effective for large and complex problems that require collaboration between different stakeholders, but should not be applied to

each and every problem. The ability of judging whether or not to apply the participative approach requires a large amount of experience.

We conclude that the importance of training and mentoring in the EKP approach and its computerised support tools should not be underestimated.

4 Conclusions and future outlook

On the whole the EKP approach has proven to be useful and well received by the stakeholders involved in the two projects. We have experienced some challenges concerning teaching, methodology guidance, and tool support. The evaluation results let us think, however, that no major changes in the approach are needed. Two more urgent needs for improvement are clear guidelines for pattern development and quality assessment as well as mechanisms and guidelines for flexible adaptation of the pattern template to specific organisational settings.

With regard to tool support for packaging, storing and making patterns available to their users, more research is needed. Although the RETH tool showed some promising results, we find that it is not targeted for the type of users that were involved in the HyperKnowledge pattern development.

5 References

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