

Knowledge Management within Onboarding Practice in Small Software Companies

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Abstract

The software industry is one of the most dynamic branches of the economy in which knowledge plays an important role in achieving success and surviving in the market. Given the openness of the market, globalization, and labour turnover in the software industry, local small software companies are increasingly challenged to attract, onboard, and retain software engineers. This paper aims to present the authors experiences in inquiring onboarding practice in a local small software company, with focus on the role of knowledge management in onboarding process. The study is based on the field work in the company, with the use of qualitative research methods, ensuring that findings are grounded in the real practice. Based on the study findings, recommendations for the practice in small software companies and researchers are discussed.

Keywords

software industry, small software companies, onboarding, knowledge management

1. Introduction

In today's dynamic world, and especially a dynamic economy, with evident movement towards remote work via the Internet, software professionals can easily change jobs and move to new companies. Software companies that hire new employees should introduce them to the company's organization, processes, and organizational culture, which is commonly implemented through the *onboarding* process [1]. Selecting and onboarding the most suitable people is challenging for each software company because it influences its overall business performances [2]. In general management literature, onboarding refers to *organizational socialization* aimed at making new hires effective members of an organization by learning necessary knowledge, skills, and behaviours [3]. Anakwe and Greenhaus [4] suggested considering the following issues during organizational socialization: what information should be transmitted to new hires, which tactics to use for information transmission, how to evaluate information transmission to new hires, and what the relationships between organizational socialization and adopted behaviours and attitudes exist.

The knowledge-based perspective of companies assumes that knowledge exists in them at any time and can be used for creating new knowledge and in business actions. This promotes knowledge management (KM) as set of activities that enable identifying and leveraging the

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collective knowledge in an organization for increasing their innovativeness and responsiveness in business [5]. Effective KM assumes that companies possess and improve learning capability, usually based on analyzing their successful and unsuccessful activities, leading to creating and acquiring new knowledge that may improve their practice [6].

Software industry has been recently recognized as a part of the economy with dominant influence of knowledge workers, pointing out the importance of knowledge management (KM) for both their daily practice and overall business [7]. For software organizations knowledge residing in the organization becomes a strategic asset for ensuring quality of products and services, as well as competitiveness at the market. In this course of thinking, the main challenge for software companies is to effectively involve new people in their organization, as well as to retain experienced workers who possess knowledge on all aspects of knowledge relevant for company practice (organizational, technical, technological) [8, 9].

The complexity of onboarding process in software companies is based on the fact that new hires should acquire different types of knowledge, such as organisational knowledge, project knowledge, product and domain knowledge, and knowledge of the technical environment [10]. New hires, especially those that recently graduated are usually not well prepared for real projects, which emphasises the importance of learning during the onboarding process [11]. Since onboarding period may be stressful for new employees, they should be encouraged to express themselves during the work, and to adjust to organizational identity, while preserving their own personal identity [12]. It is also important to recognize that onboarding process is an opportunity for mutual learning between the organization and new hires [13].

Small software companies make up the majority in many countries around the world, with the significant share in their economies [14]. However, small software companies suffer from the lack of resources, primarily financial, for investing in research and development to improve practice, products and services [15]. Therefore, small software companies are forced to improve their competitiveness through innovation, which is primarily based on the knowledge possessed by employees [16]. This indicates the need for small companies to systematize the knowledge that exists in them through organizational learning [17].

Based on the previous considerations, KM in onboarding practice is especially challenging for small software companies that strive to acquire and retain knowledgeable workers. This paper aims to present experiences in inquiring KM in onboarding practice in a small software company, and based on that to propose recommendations for practitioners in industry and researchers.

2. Experience in a Local Small Software Company

The presented experience and the findings are part of a larger project designed and implemented by the research team composed of people from the *Information Technology Department* and *Engineering Management Department* from Technical faculty "Mihajlo Pupin" Zrenjanin, Serbia. The project objective is the inquiry into onboarding and knowledge management practices in small software companies in Serbia, with a special focus on assisting indigenous software companies in practice improvement and better positioning in the market.

In this section will be presented results of joint practical and research work of the author and

the company manager of a local small software company. The research objective is to identify knowledge management practice relevant for onboarding related processes in the company.

The study uses qualitative research methods with flexible research design [18] suitable for inquiring human related issues in the industrial practice [19, 20, 21] or systematizing knowledge about the practice [22]. Reflexive thematic analysis [23] for analysing data and constructing the findings is used.

2.1. Context

The presented research relates to the practice in a local small company that provides software engineering services and IT infrastructure services according to the turnkey principle. The company has 8 employees and has operated for 20 years in Serbia and the region. Software engineering services include the development and maintenance of specific software solutions, mostly based on cloud and mobile technologies. The main domains of applications are inventory management and monitoring of fixed assets, control of the implementation of standards in the company, including the qualifications of employees for optimal engagement in the workplace and the organizational structure with the systematization of workplaces.

2.2. Knowledge Management in Onboarding Practice

This section will present findings related to knowledge management practices within onboarding in a selected small software company. The findings are constructed through an inductive approach based on reflexive thematic analysis and are grounded in interviews with the company manager and available documents. The findings are developed as a thematic framework that includes themes and relationships between them, representing identified issues in the observed practice in the company.

Through thematic analysis a thematic framework with several main themes related to onboarding practice was developed. The whole thematic framework contains the following themes [24]: *Onboarding process*, *Objectives*, *Prerequisites*, *Outputs*, *Shortcomings*, *People*, *Tools and methods*, *Work position*, and *Knowledge management*. Each of the main themes encompasses several sub-themes related to a specific aspect or segment of the theme.

The segment of the findings related to relationships between onboarding process and knowledge management is presented in Figure 1. The direct relationship between two main themes (*Onboarding process*, *Knowledge management*) is shown with a thick solid line, while indirect relationships through other themes (*Work position*, *Tools and methods*) are shown with thin dashed lines.

Onboarding process was identified as the main and central theme in the thematic framework, relating to the process all candidates for working engagement should pass. The steps in the onboarding process are: getting to know the overall organization and culture of the company, introduction to a team in which a candidate will work, introduction to a technical platform, and introduction to projects in which a candidate will be involved.

Knowledge management is the next most important theme related to issues of capturing, organizing, and reusing various types of knowledge that exist in the company. The main characteristic of knowledge management is that it is managed selectively, which means that

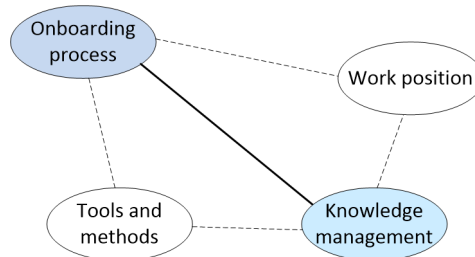


Figure 1: Relationships between onboarding practice and knowledge management in the selected small software company

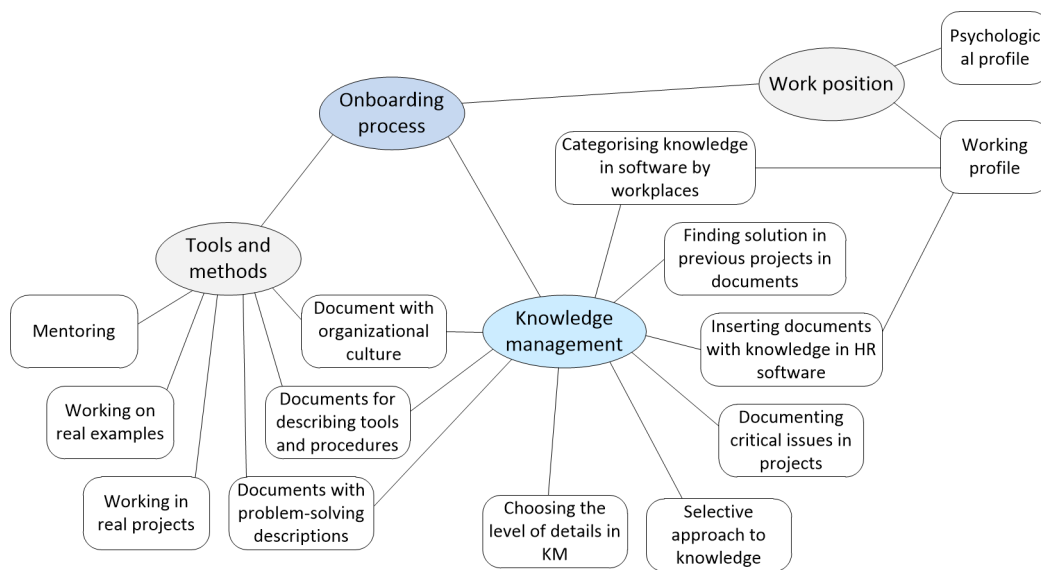


Figure 2: Detailed thematic framework with themes and subthemes related to the relationships between onboarding practice and knowledge management

only specific and the most critical knowledge from past projects was selected, collected, and prepared for current and future projects.

Tools and methods is another theme related to practical issues in onboarding process realization. It includes the use of various types of documents in onboarding (documents with organizational culture, documents with technical issues and problems), mentoring candidates, and assigning simple tasks from real projects to candidates.

Work position is the theme related to tailoring the onboarding process to specific work positions in the company, which includes determining the working profile (technical and technological issues) and psychological profile of candidates.

The developed thematic framework contains the main themes represented in elliptical shapes and subthemes represented in rounded rectangles, as it is presented in Figure 2.

The relationship between theme *Knowledge management* and theme *Work position* is realized through the connections of subtheme *Working profile* associated to *Work position* and subthemes

Categorising knowledge in software by workplaces and Inserting documents with knowledge in HR software associated to *Knowledge management*. These themes and relationships are grounded in the company practice since the company maintains a working profile with associated knowledge for each work position in the HR software. During the onboarding process, the new employees are directed to use the software to access knowledge for their positions. As the practice evolves, documents with knowledge change and adapt to new working conditions, leading to updates of the knowledge base in the software.

The relationship between theme *Knowledge management* and theme *Tools and methods* is realized through identification of three subthemes that are associated to both main themes. These subthemes point out the use of various types of documents for systematizing knowledge (*Document with organizational culture*, *Documents for describing tools and procedures*, and *Documents with problem-solving descriptions*), and at the same time these subthemes are identified as a tool within onboarding process in the company. These subthemes related to the use of documents identify the following aspects of knowledge to be managed for successful onboarding practice in the company:

- *Knowledge on organizational culture*. This aspect reflect the importance of human and organizational issues in the company, to which new employee should align during onboarding process.
- *Knowledge on tools and procedures in technical work*. Technical part of the work consumes majority of time in the company, and quick and effective introduction to technical tools (integrated development environments, platforms for sharing materials, version control systems, etc.) and working procedures is essential for onboarding and overall business performance in the company.
- *Knowledge on problem-solving issues*. Software development, as a set of knowledge based activities, requires engineers with problem-solving skills. Having systematized experience with problems in previous projects can significantly improve onboarding practice.

3. Recommendations

3.1. Recommendations for small software companies

Based on the analysis of literature in the introduction section, and findings of the study, the following recommendations for the managers and engineers from small software companies can be proposed:

- *Hiring academic researchers for practice research*. Lack of resources, employees fully devoted to daily tasks, and the lack of experience with research methods by employees is the reason for not starting projects for analysing and improving practice in small companies. The most effective way to overcome this is to engage researchers with experience and work together on a research project.
- *Use of established and well known knowledge management methods and tools*. Avoiding ad-hoc approaches through the use of proven methods and tools during the inquiry of practice will result with more reliable KM practice and its better alignment with onboarding process.

- *Aligning knowledge management with all working positions.* Knowledge should be carefully inquired and systematized for each particular working position. This should include knowledge relevant to the psychological, organizational, and technical aspects of each working position.
- *Systematizing and documenting knowledge residing in the company.* Knowledge should be collected from previous projects, activities, and tasks, and made explicitly available to all employees, especially those in the process of onboarding. This will make the onboarding process more effective, while minimizing engagement of other employees in the company during onboarding.
- *Connecting the onboarding process with real projects to enhance the acquisition of real knowledge.* Including new hires during onboarding in real projects enables them to gain knowledge on the most relevant technical and non-technical issues. This will enable the direct sharing of knowledge between employees with more experience and new hires, and foster organizational learning in the company. It also leads to an increase in the satisfaction of new employees due to their contribution in solving real problems on projects.

3.2. Recommendations for researchers

In addition to recommendations to practitioner from software industry, the following recommendations can be proposed for researchers:

- *Joint preparation and implementation of the research with company employees.* The best possible overview of the practice and the most relevant research objective can be achieved through joint work with company employees in all phases of the research. In addition, this will ensure more reliable findings.
- *Research based on active field work.* Active fieldwork presupposes the presence of the researchers in the real world environment using proven fieldwork methods such as interviews, observation of practice and note-taking, access to documentation and electronic data, and meetings. This enables a more comprehensive insight into practice, and increases the confidentiality of findings by triangulating data sources and applied research methods.
- *Involvement of company employees in all research activities.* As already emphasized in the literature, employees are the main source of knowledge about organizational processes, organizational culture and technical aspects of practice, so it is necessary to actively include them as sources of data, as participants in data analysis, but also later when verifying research findings.

4. Conclusions

This paper points out the importance of KM and onboarding practice in small software companies, which needs to be creative and responsive to survive at the competing market. In addition to presenting well known issues reported in the relevant scientific literature, the paper presents the experience in inquiring onboarding practice in the local small software company. Research

findings, constructed through qualitative inquiry of the company's practice, indicate multiple relationships between KM and onboarding in the selected company. Based on the study findings, recommendations for small software companies, and researchers are proposed.

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