Available online at www.sciencedirect.com

ScienceDirect

Procedia Computer Science 192 (2021) 4406–4415

Procedia Computer Science

www.elsevier.com/locate/procedia

25th International Conference on Knowledge-Based and Intelligent Information & Engineering Systems

Towards agile knowledge management in an online organization

Naprawski, Thomas[a*]

[a]*University of Szczecin, Szczecin, Poland*

Abstract

Effective knowledge management is a powerful driver for product and organizational growth. Knowledge management allows for the efficient creation, sharing and use of information. But it is not entirely clear what basic knowledge is involved in agile practice and how teams handle it. The main aim of the article was the theoretical and empirical analysis of the agile knowledge management approach. The principles of knowledge management in connection with agile methodology were examined in the cognitive-theory section. The methodology is based on a case study applying an observational technique within an online organization. The empirical part presents a theoretical model that describes how knowledge management is used in the agile approach. These findings can aid in the understanding of agile knowledge management practices inside an online company, which includes iterative development, knowledge management and engineering practices. The results show that agile knowledge management improved in the organization's proactive process management. The significant influence is observed on staff efficiency, economic growth, and hence on customer loyalty, which boosts corporate morale while reducing resource consumption.

Keywords: knowledge management; agile approach; online company reorganization

1. Introduction

Since software development is accelerating today, it is difficult to find a project management process model that meets all of the online company's requirements. In these fields, effective knowledge management is seen as a success driver that promotes product and organizational growth. Agile approaches were discovered to be more results-oriented, reliable, and scalable than conventional project management methods. Understanding how to manage knowledge as a competitive advantage can boost team coordination and adapt responsiveness. Knowledge

* *Corresponding author email address: thomas.naprawski@usz.edu.pl*

10.1016/j.procs.2021.09.217

management techniques will greatly aid in gaining and maintaining a competitive advantage [2]. This paper would include a straightforward, analytical response and evaluation to these comments and other contentious topics. The motivation is that deciding to reorganize is very daunting for organizations that employ traditional project management approaches. To take ambitious strides toward agility, organizations must provide proof of the approach's success to ensure that the initiative is worthwhile. This problem area provided the impetus for this work.

The aim of this work is to evaluate how well an agile knowledge management methodology works with an online organization. Using a functional example, the study should decide the fundamental facets of agile processes and explain and show their productivity results. This is meant to provide a straightforward conclusion so that the findings and their meaningful evaluations can be viewed in a transparent and consistent manner. The research subject falls within the scope of the business informatics discipline. This subject is particularly important due to the rapid development of the online industry [18], [21]. The aim is to investigate the impact of agile project management types on the effective architecture of the operation management and information management areas. The project management approaches are also linked with product development, which can oversee the continuous production of facilities through the use of specific methods and tools and facilitate the company's substantial functioning in the industry. The agile methodologies in the information management field include the functionalities to change and monitor the information structures in a specific way, ensuring that all information, data, and expertise are classified in an optimized manner and that high availability and secure access are ensured. The so-called information management has a significant impact on the production processes.

The first section of the study is an overview that includes the goals and strategic objectives that can be classified in the business information management environment. The second section explores the technical facets of agile methods, such as fundamentals, definitions, criteria, and tools. The third chapter is the implementation section, which explores the case study, where the corporate arrangements, work processes, and personnel positions are presented. The predicted productivity results of the reorganization are explained at the end of the article.

2. Knowledge management in an agile approach

There are many obstacles to developing a knowledge management approach and a sustainable knowledge transfer capability. According to the organization, the uncertainty and organizational tempo of today's market climate necessarily require a modern, more agile strategy. To achieve higher levels of individual and organizational success, the information transfer process must be transformed. Agile in the field of knowledge management refers to quick delivery and outputs that are adaptable to society, context, and the business climate. Knowledge management activities are constantly informed and evolved by business strategies and organizational criteria. Agile information exchange and transfer occurs as an iterative result of the implementation of validated knowledge management practices [14].

The difficulty in allocating knowledge assets logically is linked to the quandary of extracting and utilizing knowledge that is spread in many people's minds. While knowledge has its own theoretical meaning, it is often used interchangeably with facts [12]. Nonaka defines knowledge as an interactive perspective shaped by interpersonal social experiences. Knowledge is ingrained in a person's subconscious and is the product of beliefs, procedures, attitudes, and habits. Explicit knowledge is simple to convey because it is already systematized in data, parameters, and other forms [19]. Even though expertise is regarded as the primary source of long-term advantage for many businesses, handling it remains difficult. Because of its importance and interdisciplinary aspect, various fields have analyzed knowledge management and proposed numerous principles and implementations [2]. The term knowledge management first appeared in academic publications in 1986 [9].

Knowledge transfer is the mechanism by which information is passed from one person to another. It can happen in a scheduled or unplanned way as a result of some operation [5]. Harrison and Hu define knowledge transfer as the transformation of knowledge into information, the transfer of information, and the transformation of information back into knowledge [11]. Knowledge management is described as a system that simplifies the process of exchanging, transmitting, developing, catching, and comprehending company knowledge [8]. In conventional software creation, knowledge management entailes the use of different reports to collect knowledge relevant to the various phases of the software development life cycle. Unlike conventional approaches, agile methods focus heavily

on tacit knowledge over explicit knowledge, depending on person, team, and consumer communications and experiences [3].

Project management is an umbrella term that can be divided into several stages, such as: project planning, project management and project control [20], [22]. In order to select the most efficient process model, adapted project management approaches must be used. The project management method defines individual steps of the project as well as the role and their responsibilities. Improving future projects will expose you to a variety of threats along the way. To keep the project from collapsing, the project manager should recognise project risks early on. The following are some of the possible risks associated with IT projects:

- Inadequate project specifications, such as defining project priorities, requirements, and project coordination.
- Using inappropriate approaches and procedures.
- Project planning is insufficiently specialized.
- Mistakes and incompetence in project execution and management.

The above risks are proven by a Harvard Business Manager report, which are seen as a proportion of failed ventures in comparison to failure factors (table 1).

Table 1. Rate of unsuccessful projects in relation to the failure factors[1]

Rate of unsuccessful projects	failure factors
81.3%	The essential decisions that were necessary, not made or not discussed
77.4%	No control during the implementation process
75, 0%	Unclear and missing project goals
69.3%	Unrealistic requirements
63.1%	No understanding of project planning
61.8%	Faulty standards and guidelines

The optimal project management method can contribute to the project's completion with the aid of the appropriate work equipment, but there is no promise of a good outcome at this time. The approach simply offers the tool for achieving project goals; it does not override the project team's experience and expertise.

The United States Navy introduced the PERT (Program Evaluation and Review Technique) in the 1950s, which led to the implementation of the WBS, which is now a central feature of project management. Over the same decades, the Department of Defense and NASA used both systematic and iterative growth approaches. In 1974, EA Edmonds published a paper titled "A Method for the Implementation of Applications for Non-Technical Users as an Adaptive System" [24], which was the first to use the adaptive software development process. So-called "heavyweight models," such as the waterfall System, gained attention in the 1970s and 1980s, but due to dissatisfaction in the 1990s, these systems were considered regulated and regulated. As a result of the heavyweight revolt, modern "lightweight" approaches were created. There were four lightweight techniques in 1995 [4]: Scrum, Adaptive Software Development, Feature Driven Development (FDD) and the Dynamic Systems Development Method (DSDM). Two more were added in 1996, Crystal Clear and Extreme Programming. On February 17, 2001, at a resort in Utah, proponents of the various "lightweight" methods gathered to discuss software development. The union, which resulted from those meetings, is called the "Manifesto for Agile Software Development" and established the basic concepts of agile software development [24]. The agile manifesto, which outlines the ideals of agile software development, serves as the foundation for agile project management. The manifesto elevates the team members and explains them as the most critical success factor. If each employee is responsible for the initiative, the project's execution will be sped up. Throughout the project, agile project management relies on the working program

[1] Own elaboration based on [23]

and rejects needless paperwork. Just what is absolutely important is recorded. The project should begin with collaboration with the client. Since the client may need the latest functionalities in the future, the user can make decisions about upcoming applications [4]. The following agile strategy emphasizes the importance of responding to new requirements during the project cycle in a timely manner.

Various agile strategies have been discussed in the history of agile emergence. Based on the agile manifesto, each agile approach has developed its own set of concepts and values. The key concepts are as follows [13], [1], [6]:

- Scrum is a way for teams to work together to develop a product together. The product in Scrum is broken down into small pieces, where each new event is built up from the pieces previously created.
- Extreme Programming is a discipline of software development based on values: "Simplicity, communication, feedback and courage" In this method, the core idea is to bring the whole team together and introduce the simple exercises that should be graded afterwards.
- Feature Driven Development (FDD) (FDD) is an iterative technique for developing applications. The use of object-oriented programming is scheduled for vast teams collaborating on a project. FDD was worldwide launched in 1999 with the book "Java Color Modeling with UML."
- Dynamic Systems Development Method is an agile paradigm for project management. DSDM is an agile technique developed in 1995 which lasts for the longest period. It was used as a tool for the creation of applications.
- The Crystal Method has been developed by Alistair Cockburn as an agile software development method. This approach is focused on the knowledge obtained from many projects and their study. The specific properties of the approaches include: team size, procedure criticism and project expectations.

In agile project management, Ebert recognizes three levels of knowledge [10]. They are associated with knowledge about:

- Product - understanding of product specifications and how they apply to other devices and requirements.
- Project - understanding of tools, functional specifications, products, schedule,, deliverables, increments, quality, and performance criteria.
- Process - awareness of enterprise procedures, roles, technology, and processes.

The review of literature concentrated on defining the concepts of knowledge management and agile project management. The methods and characteristics of agile techniques, as well as their connection with knowledge management, were explained with reference to management within the organization. The concepts of knowledge management in an agile approach presented in the literature review are not extensive, and will be described from a practical standpoint in the following work in relation to the rapidly growing online sector, which is distinguished by dynamic adaption capabilities and a strong need for innovation and adaptable management practices.

The study should respond to the following questions: What are the main characteristics of agile project management methods? Which knowledge management techniques are needed for the agile approach to be successful? How is the rate of software or product growth changing? What role do workers play in agile project management methods? How adaptable are both project management approaches to changes in requirements? The research presented below will help online businesses in assessing and selecting the best management method to increase efficiency and conduct processes more efficiently.

3. Research methodology

The aim of this research is to identify the key elements of agile management in terms of knowledge management, as well as to evaluate how this method works with online businesses. This will be accomplished through a case study [17] using the observational approach and an examination of project documentation. The case study is focused on an examination of an online tourism business based in Germany. The organization was identified as a result of the intentional sample research [7]. The company employs 75 people and has a conventional organizational structure and policies that do not suit the modern needs of the online industry. The observations began with the identification of the knowledge management structure, methods, obstacles, practices, techniques, and tools during the transition

from traditional project management to agile management method. The information gathered allowed for the development of a descriptive analysis. The team has been working stationary at the company's headquarters, allowing for detailed surveillance in the workplace.

The corporation has agreed to move from traditional to agile project management approaches, with a concentration on adaptable knowledge management approaches. In traditional structure, the company was divided into thirteen departments: UX, IT Frontend, IT Backend, IT Development & Operations, IT Mobile Team, Community, Content, Editing, QA, Project Management, Controlling, Marketing, and Product Owner Team. Each field was appointed a project manager who represented the needs of each department. Each department was established to meet the unique requirements of the online travel industry.

In the classic theory, the online business is based on three factors that, if fulfilled, could ensure success. Every project had its own set of criteria, to which specific resources and deadlines were allocated, but which, in most situations, were underestimated, causing the limitations to be often exceeded. The company's methods follow a predefined series, which correlates to the traditional approach. Since the organization is engaged in the online market and performs weekly implementation processes where new and updated functionalities are written. The processes follow a set sequence, and each move is assigned a special status based on whether the criteria were fulfilled. This approach is only effective if an optimistic case is assumed, that is, if it was done properly from the start with no bugs, faults, or demands for modifications. Complications, such as when the feature is not compatible with all browsers, layout slip, the font shown with a different style saved cookies incorrectly, or tracking variables are incorrectly assigned, necessitate changing the project status and running a long backwards loop, skipping departments and increasing the project's time and resources.

3.1. Target state

The organization has agreed to form the first Scrum team and concentrate on proactive knowledge management. Selected agile processes, concepts, and standards are used in order to eventually turn the enterprise into an agile organization. The agile software development approach has the potential to have the requisite freedom to improve the enterprise and knowledge management, as well as a stable platform for successful product development, for the online business that hires highly oriented, self-organized, and scalable specialists. The first Scrum Team was made up of twelve people coming from various divisions (Fig. 1).

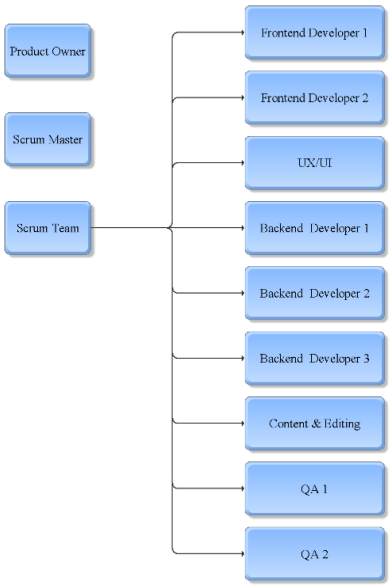

Fig. 1. Scrum Team structure[2]

The positions were reorganized, and the current Scrum Team had the following members: Product Owner, Scrum Master, and Scrum Team. Employees with various expertise were assigned to the squad, including five IT members from the backend and frontend areas, two quality assurance employees, one content employee, and one customer interface employee.

Several agile methods, such as release preparation, frequent stand-up, sprint retrospective, and planning game, were used to handle product, project and process knowledge. In terms of knowledge management, each role has its own set of tasks and responsibilities:

- Product Owner (PO)
  - in relation to customers and corporate management: PO is in charge of overall coordination. He is the team's point of contact with administrators, and he escalates issues that the team cannot resolve on its own. Stakeholder and one management member present to the PO.
  - in relation to the Scrum Team and Scrum Master; PO keeps a regular prioritized product backlog of the issues that have been created and will be carried out by the team. The PO has a recent status update from the staff on hand for management inquiries.
- The Scrum Master represents the team's interests. Keeps the squad safe from outside pressures. Creates the Sprint backlog, which is required for the next sprint. All Scrum meetings are organized by this individual.
- The Scrum Team should collaborate in a straightforward manner, sharing information and reporting their own work outcomes within a sprint. The squad should report challenges, difficulties, or inefficiencies to the Scrum Master on a regular basis, such as during the Daily Stand Up. The Scrum Team contributes proactive proposals and growth plans that can be prioritized in the backlog.

The Scrum Master, Product Owner and Scrum Team are key factors in achieving Scrum's organizational goal. The relationships between the positions are very similar and cannot be treated in a hierarchical manner. Scrum positions are responsible for design, growth, self-motivation, and so on, and since their operation does not depend on an outside hand, they become very self-confident and dedicated.

3.2. Process flow

The agile knowledge management was set up in a very flexible but efficient manner, with the bulk of the testing completed inside the Scrum team. Figure 2 would be used to discuss the agile knowledge management approach.

Following a business case step by step, we can observe that the specifications for the new project were developed in the marketing department; later, the project management department identified the project's priorities, costs, and climate, and then produced a project for proposal execution in collaboration with the marketing department. As a result, the proposal was submitted to the stakeholder for project approval, who then contacted the relevant product owner to clarify the basic specifications of the new functionality. In the following steps, the product owner evaluated the basic criteria and generated a user tale using Jira tools from the user's point of view. The product owner was able to plan the product backlog, which was placed in a prioritized order, based on the generated and documented user stories. At the start of each sprint, the team chose user stories from the product backlog that would be introduced during the sprint time and for which a team backlog would be created. Following the selection, the acceptance of all participants was expected.

During the sprint, the team was exposed to the various agile concepts and values for application, as well as Confluence and Jira software support for effective project execution. Within the team, the architecture, content, quality assurance, and implementation process are all ensured. During the implementation process, the concepts of

[2] Own elaboration

Extreme Programming, which emphasizes "baby steps," redundancy, and continuous improvement, were applied. The Dynamic Systems Development Method establishes the foundation for collective and mutual processes for deployment and testing. It was also specified unequivocally that all implementation phases should be reversible and completed within a specific time frame.

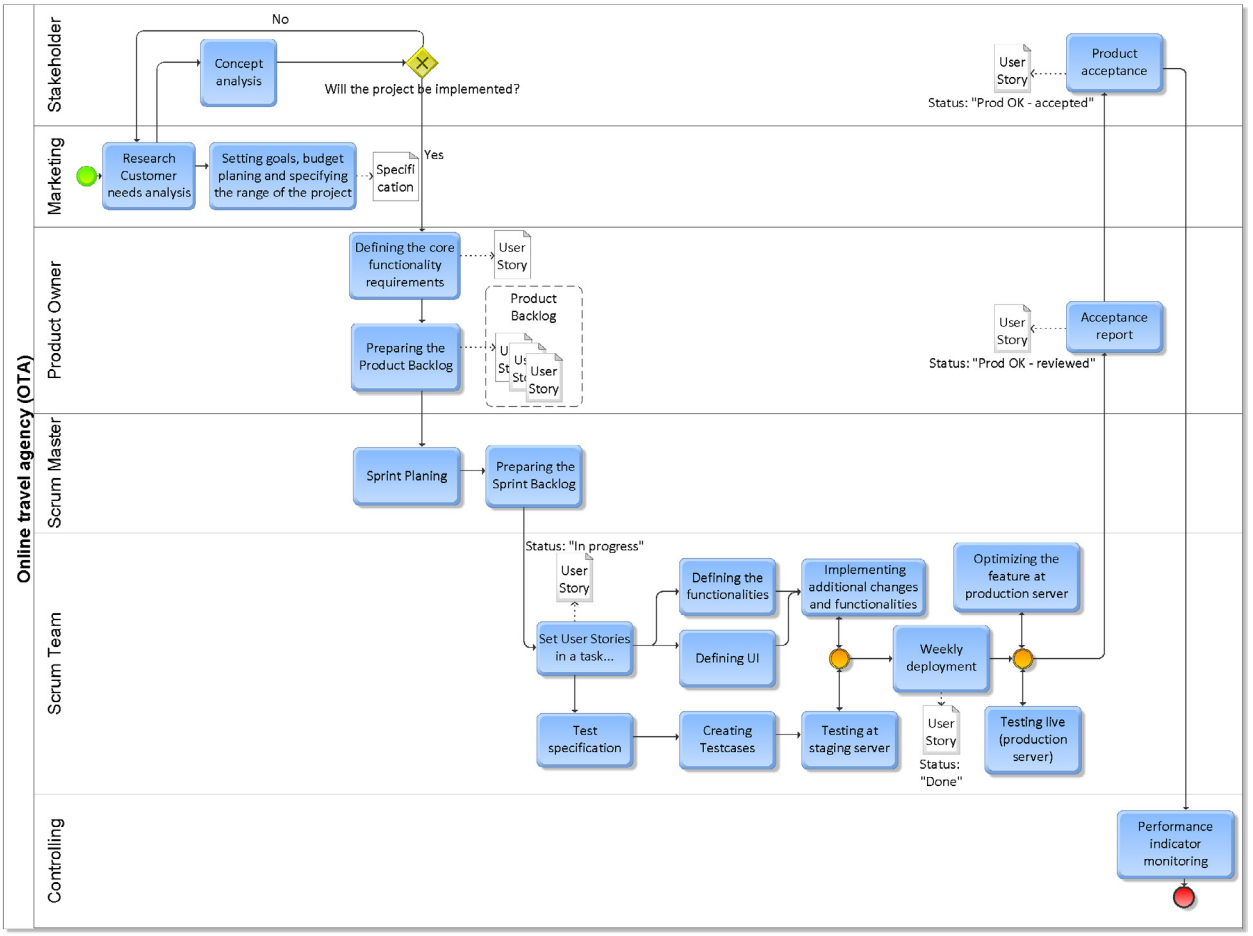

Fig. 2. Agile Knowledge Management in Online organization[3]

Frequent and prompt distribution is an essential concept of both DSDM and Crystal Clear, and it is distributed to the business every other week. Following the weekly deployment, the functions were reviewed again in the production environment and, if possible, refined there, but this was very rare because the functionality was continuously tested during the implementation. The product owner certified the properly working product, which was then submitted to the stakeholders for their approval. At the close of the sprint, all findings were submitted to management, and after the review, a retrospective of all team members was conducted, in which all evidence and positive incidents were gathered. All features developed by the team must be reported and tracked, because of subsequent developments and modifications to features. The monitoring department tracked a commodity running in the system to obtain production data. The performance variables obtained with the features have to be recorded at frequent intervals (e.g., increase in traffic, increase in bookings, cost reduction), provided that the factors are

[3] Own elaboration

measurable and assignable. Classification of the total team results in the light of the company's higher-level planning roadmap, to be generated in collaboration with the contact person from management.

The agile process flow was set up very effectively and was marked by easily applied and satisfied employees who were in charge of project processing. However, when developing the features, one must also keep a close eye on the budget. Since the functionalities that occur in an agile environment are more difficult to predict in terms of costs, it is critical to report implementation time and other costs per functionality for the specific features. Cost reporting for the entire project team was compiled based on cost forms. The budget coordination was carried out at regular intervals with the contact person from management.

Many of the values were thoroughly met during the agile work. Prior to the production phase, the team members were expected to have general unanimity, also known as dedication. The planning process was carried out in the best manner possible while ensuring job accountability, as team members collectively present what they have accomplished and what they will be faced with today or what challenges are in front of them on a regular basis.

Pair programming was often used to share interactions and create seamless code. In reality, the agile method flow responds very quickly to expectations and desires that can be embraced and validated right away.

3.3. The outcome of reorganization

A long-term enterprise process was planned to transition from agile to traditional project management. Initially, the step-by-step reorganization process entails Scrum teams creating and tracking a large number of websites. Following the order-setting of all ambiguities, the complete restructuring, organizational cultures, and processes had the most effect apparent from the transition to agile knowledge management. Crucial performance results should be observed during the first step of the reorganization:

- Processes had been sped up, and the entire planning process had been carried out as a team effort. There was a very short and simple communication route between workers, which saved time for product creation.
- The agile knowledge management approach works actively with the customer in the planning phase. The user assesses all initiatives and adapts their implementation specifications to the client.
- During the assessment, all the team members expressed a view, which gained the optimised prediction outcome that was very useful for more accurate project planning. The product development wishes were better evaluated.
- During the creation process, only basic necessities such as programming procedures, special device specifications, or scripts for automated tests were documented in an electronic version. This promise guaranteed both time and cost savings.
- The large projects were broken down into tiny individual pieces called user stories. Smaller components were introduced and reviewed more rapidly, and then combined to form an executable software package. The team's effectiveness increased as a result of the piecemeal implementation of Scrum defines a straightforward role: It is critical to understand who is responsible for what. Since there was always a problem with the traditional approach, namely a communication person to solve a particular issue. In this scenario, agile project management provides a clear view of the corporate framework or team structure. the software product.
- Scrum defines a clear role: It is very important who is responsible for what. Since there was always a difficulty with the classic approach, namely a contact person to solve a specific problem. In this case, the agile project management gave a transparent outlook on the organizational structure or team structure.
- Unnecessary costs were eliminated and therefore cost savings were ensured by adapting flexibly to change requests, which is the central concept of the Extreme Programming Method.
- A bond was formed among the team members who worked together every day, ensuring productive coordination among employees and improving the working environment.
- Each employee in the Scrum Team had a say and was free to spread his thoughts or needs without fear, increasing the employees' independence and happiness, as well as their sense of humanity and welfare.
- Employee satisfaction guaranteed effective and precise work, resulting in happy customers.

4. Discussion

The goal of this study was to describe the most important aspects of agile knowledge management in an online organization where effective management is seen as a key to success. Agile methods in online businesses, according to our research, are more results-oriented, reliable, and scalable than traditional project management approaches and procedures. In studies dealing with agile knowledge management techniques, reasonable favorable findings may be observed.

Clerk, Lago, and Vliet highlighted the benefits of using agile knowledge management. They observed improved interaction and enhanced knowledge exchange in their assessment of the organization using agile approaches. They also noted the development of customizing techniques, which promotes balance in decision making [25]. Knauss, Liebel, Schenider, Kasauli, and Horkoff found different key criteria for agile management in their research, such as awareness of social and socio-technical objectives and challenges. On this basis, the authors present a lifetime of experiences gained during the organization's software development. However, they also underline the importance of the aspect associated with agile knowledge, which is the acquisition of iterative experience (while keeping the quality approach in mind) [16]. According to the research, Kawitha and Ahmedd demonstrated that knowledge management is an important aspect of software development. Their results demonstrated how the agile approach may assist in dealing with communication and knowledge sharing [15].

Future discussions and research on agile knowledge management may focus on quality analysis of the architectures developed, as well as analyzing and comparing key organizational performance indicators to identify the level to which agile knowledge management impacts the company's business success.

5. Conclusion

The transition to agile knowledge management approach was completely integrated into the online company environment, demonstrating the importance of the field of business informatics. The critical processes and their procedures were supervised and streamlined as a result of the reorganization, resulting in an efficient knowledge management framework.

Agile knowledge management, in particular, helped to support proactive process management. The effective outcome of restructuring also involves structural service architecture, which in agile management controls the creation and design of services that influence the close functioning of the enterprise by using the right methodology and software tools.

The information management work area benefited from the reorganization as well, since the information systems were geared to agile project management, and thus the information, data, and skills were presented and managed more transparently, whereby fluent and rapid knowledge management is essential for IT Controlling as well as the whole online enterprise. All of these have a significant effect on staff efficiency and economic growth and employment productivity, and therefore on customer loyalty, which increases the company's morale while lowering resource consumption and costs.

The most important disadvantage of the reorganization is the cost of creation. The transition period, which includes training, research, technology acquisition, establishing new work requirements, and adjusting roles, consumes a considerable amount of time and money. During the transition, the business is not running as well or successfully as it should be. In order to achieve significant success outcomes in business in the future, the initiation process must take place.

References

[1] Ambler, S. W. (2012) “Feature Driven Development (FDD) and Agile Modeling” Ambysoft.

[2] Andrade Barros Ouriques, R., Wnuk K., Gorschek T., and Berntsson Svensson, R. (2019) “Knowledge Management Strategies and Processes in Agile Software Development: A Systematic Literature Review.” International Journal of Software Engineering and Knowledge Engineering 29(3): 345-380.

[3] Andriyani Y., Hoda R., Amor R. (2017) “Understanding Knowledge Management in Agile Software Development Practice” Knowledge Science, Engineering and Management 10412: 195-207.

[4] Apenko, S.N., and Romanenko M.A. (2020) “Knowledge management in agile teams of flexible projects of the enterprise” CRC Press 1: 1-2.

[5] Brito, M.F., Figueiredo, R.C., Venson, E., Canedo, E.D., and Ribeiro L.C.M. (2017) “Knowledge Transfer in a Management Process for Outsourced Agile Software Development” Proceedings of the 50th Hawaii International Conference on System Sciences.

[6] Caine, M. (2011) “DSDM Atern im Überblick” Thema development.

[7] Czakon,W. (2006) “Łabędzie Poppera –case studies w badaniach nauk o zarządzaniu“ Przegląd Organizacji 9 (80): 9–12.

[8] Davenport, T.H., Prusak, L. (1998) “Working Knowledge - How Organizations Manage What They Know” Harvard Business School Press 5(193): 211.

[9] Doran, H. (2004) “Agile knowledge management in practice” Advances in Learning Software Organizations 3096: 137–143.

[10] Ebert, C.D.M., J (2008) “Effectively utilizing project, product and process knowledge” Information and Software Technology 50(6): 579-594.

[11] Harrison, A., Hu, Q. (2012) "Knowledge Transfer within Organizations: A Social Network Perspective" 45th Hawaii International Conference on System Sciences (HICSS): 3766–3775.

[12] Hayek, F. (1945) “The Use of knowledge in Society,” The American Economic Review 35(4): 519–530.

[13] Jeffries, R. (2001) “What is Extreme Programming” XProgramming - An agile Software Development Resource.

[14] Kaplan, B. and Greenes, K. (2016) “How to Rapidly Develop a Sustainable Knowledge Transfer Capability While Increasing Performance” KM Agile, Agile Knowledge Management.

[15] Kavitha, R. & Irfan, Mohammed Salman. (2011) “A Knowledge Management Framework for Agile Software Development Teams”.

[16] Knauss, E., Liebel, G., Schneider, K., Horkoff, J., and Kasauli, R. (2017) “Quality Requirements in Agile as a Knowledge Management Problem: More than Just-in-Time” IEEE 25th International Requirements Engineering Conference Workshops, IEEE Computer Society: 427–430.

[17] Kostka-Bochenek, A. and Lisiecka,K. (2009). „Case study research jako metoda badań naukowych” Przegląd Organizacji 10(837): 25–29.

[18] Mertens, P., Bodendorf, F., König, W., Schumann, M., and Hess, T. (2017) “Grundzüge der Wirtschaftsinformatik” Springer Gabler, Berlin Heidelberg: 3-4.

[19] Nonaka, I., Toyama, R., and Konno, N. (2000) “SECI, Ba and Leadership: a Unified Model of Dynamic Knowledge Creation,” Long Range Plann” 33(1): 5–34.

[20] Probst, H.-J.(2007) “Projektmanagement leicht gemacht : Projekte erfolgreich planen, steuern und abschließen” München Redline Wirtschaft:14-15.

[21] Prof. Dr. I. Vieweg, P. D. (2012) “Einführung Wirtschaftsinformatik - IT-Grundwissen für Studium und Praxis” Heidelberg: Springer Gabler: 2-4.

[22] Schwab, J. (2011) “Projektplanung mit Project 2010 - Das Praxis Buch für alle Project-Anwender” München Hanser: 2-3.

[23] Tiemeyer, E. (2010) “Handbuch IT- Projektmanagement - Vorgehensmodelle, Mannagementsinstrumente, Good Ptactices” München Hanser: 114.

[24] Weiss, B. O. (2008) “APM - Agiles Projektmanagement” Heidelberg: dpunkt Verlag: 12-13.

[25] Vliet, H., Lago, P., and Clerc, V., (2011) "Architectural Knowledge Management Practices in Agile Global Software Development," in Global Software Engineering Workshop, IEEE International Conference on, Helsinki, Finland: 21-8.