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Critical Success Factors for the Development and Adoption of Mobile Applications in Logistics

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Abstract

Scrum and agile working techniques are currently used in many types of software development, as well as in the development of mobile applications. These techniques and processes can influence the success of the project as a whole as well as the work of the agile project team. On the basis of a single-case study in the logistic sector with eight conducted interviews, these influences and critical success factors were investigated. The method of Grounded Theory was used to gain new insights and connections of critical success factors from the findings and results. It can be assumed that there is a general potential for digital transformation of the logistics sector that leads to the need of mobile applications. Through the agile development of these applications, employee motivation can increase and ultimately result in higher quality applications.

Keywords

Mobile Applications, Scrum, Agile Project Management, Logistic Sector, Digital Transformation

1. Introduction

Software development in modern companies is a practice, which depends on many different variables. Constantly changing requirements lead to a change in the applied project management methodology. Project management models, which are usually the basis for software development, are in transition and the agile approach is gaining importance (Lison & Hartel, 2016). The focus of this study is on the development and adoption of mobile applications in logistics, which play a central role in the economy as a whole through the connecting function of different companies (Zanker, 2018). In Germany, the sector acts as the third largest economic sector in terms of the number of employees (Grotemeier, 2018) and serves as an important basis for globalisation (Zanker, 2018).

Similar contexts were explored in prior research and examined project success. In these contexts, a need for agile project management is needed through (Komus & Kuberg, 2017). Agile project management is by no means a guarantee for a successful project. It is not applicable in every project type and the application must be evaluated before every possible project (Coram & Bohner, 2005). The spread of agile methods is increasing and it is important to convince the employees of its advantages. Otherwise, the application of Scrum, as an agile practice, results in a challenge because an agile corporate culture is missing (Cristal et al., 2008). In the logistics sector, an increase in the use of mobile applications, related to the increasing use of mobile devices, can be observed (Speranza, 2018). According to past research, mobile applications are a decisive competitive factor in logistics and foreign trade and are used in 54.6 percent of the cases (Lison & Hartel, 2017). A survey with a wide variety of companies, among others from logistics, examines the use of agile project management for logistical issues. For a large proportion, the agile approach is a faster way of implementing projects and can lead to an increasing motivation of employees. In 75 percent of cases, the agile corporate culture is also an important factor for success (Lison & Hartel, 2016).

The use of Scrum has already been investigated in different industries by examining case studies, for example in the pharmaceutical industry (Azanha et al., 2017), but a case study in the field of logistics is missing so far. By working with an agile approach, customers in this industry can get a usable product faster and the project team is more

motivated and satisfied (Azanha et al., 2017). Further research with industrial setting points out that the motivation for change to agile must be found and that the entire company must be involved and a successful project can result (Könnölä et al., 2016). On the basis of the increasing use of agile working methods and the previous research in different industries, this research is carried out with the logistics industry in the focus. The following study examines how the success factors of agile project management, and of the agile project team, affects the success of the development and adoption of mobile applications. From this, the following research question can be derived:

How does critical success factors affect the development and adoption of mobile applications in logistics?

For answering this question, the methodology of a single-case study design with multiple units of analysis, two investigated projects, was chosen (Yin, 2018). Both projects dealt with the development and adoption of a mobile application. The case study was conducted in an international logistics company, which uses Scrum as agile project management method. Data were collected in a qualitative examination of eight interviews with employees from the projects. A Grounded Theory was derived from the case study results in the last step. Due to the lack of consideration of the logistics sector in the setting of a case study, this approach is appropriate to derive fundamental new and generalizable results.

The paper is structured as follows: Section 2 contains the most important foundations in the context of an agile project management and digital transformation in logistics. Section 3 shows the explanations of the research approach and design. In section 4, the presentation of research findings takes place and the derived Grounded Theory is explained in section 5. Implications for theory and practice are presented in section 6 and the conclusion follows in the last section.

2. Theoretical Background

2.1. Agile Project Management Approach and the Agile Manifest

In contrast to the classical project management approach, the agile project management approach is characterized by a weak degree of formalization and an iterative nature of tasks. The basis for agile procedures is the agile manifest, which was prepared in 2001, as the result of the agile movement. It unifies the common

case study company. However, since this was the focus of the investigation, the results still make a valuable contribution (Myers, 2000).

In retrospect, the case study leaves scope for further research. The developed Grounded Theory can serve as a basis for this research. By future investigations, it should be examined whether this model can remain in its dimensions, or whether an extension respectively an amendment must take place. In this context, it is possible and target-oriented to expand the population to about 20 respondents, as is the case in comparable studies in other industries. It can be extended in the investigated logistic company, but also the possibility of a multiple case study can be chosen. Here the research design can be built up over several global logistic companies in order to create a better comparability and a higher generalizability.

8. Conclusion

The decision to conduct a case study in the logistics industry is to be justified by the lack of previous comparable research in this field of logistics. At the same time, the need for research in this field is clearly illustrated by the potential for digital transformation in logistics. The development of mobile applications with the help of Scrum, as an agile procedure model, contributes to the realization of the potential for digital transformation. It can be seen that the agile development has long arrived in this industry, but in the case of the investigated company, it is not yet applied to the full extent because only sensible aspects are implemented. A special focus must be placed on the role of subcontractors in one of the investigated applications, as it is designed for people who only have an indirect relationship with the company. In comparison to other industries, this characteristic leads to additional complexity in the development and introduction of mobile applications. Finally, the agile development of mobile application has resulted in increased employee motivation. An agile development and adoption of applications can be seen as a clear advantage in logistics as the findings shows. The research question posed at the beginning aimed at the investigation of the influence of the highlighted success factors on the development and adoption of mobile application. It can be seen that these success factors influence a project for an application in a variety of ways. Starting from a basic potential to digitise the industry, there are interdependencies to the challenge of taking up the requirements of new applications and the challenge of subcontracting. Essentially, the

results of the investigation of this sector are consistent with those of the other sectors mentioned above, although it is important to bear in mind the specific features of the sector. However, waterfall models are still important and are not completely detached by Scrum in this context, as they result in advantages for projects and software that have a significant influence on the IT infrastructure. Scrum is an advantageous method for the development of mobile applications in logistics. Due to the constantly changing processes caused by digital transformation, the influence of the agile project management in this sector will continue to increase in order to counteract the resulting challenges.

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