Discussion of the Influence of Innovation Culture on Smart Services – An Agrotechnical Perspective

Bachelorarbeit

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Contents

1. Introduction

Agriculture is one of the oldest economic sectors and has always played an essential role in providing a high standard of living. Smart services, on the other hand, are leveraging knowledge derived from the increasing amount of available data and are an important part of today's technological developments. With digitalization emerging in almost every aspect of day-to-day life, smart services are applied in agriculture as well. In the present thesis, the purposes of smart services in agriculture and especially the influence of an innovation culture are examined. Agriculture and agrotechnology were chosen as scope due to their advanced state of the art. Unlike common belief, companies in agriculture are characterized by a high degree of innovation performance, which makes agriculture a suitable scope for analyzing the effect of innovation culture on smart services.

1.1 Relevance of the Topic

In recent times, the agricultural sector is facing severe challenges, which caused decreasing revenues for farmers. Since the agricultural machinery industry (AMI) is highly depending on the farmers' demand for agricultural machinery, manufacturers aim for providing new solutions to their customers. Agricultural machinery manufacturers (AMMs) have improved their products and began offering smart services as new solutions. Due to both the recent disruptions as well as many applications of digitalized technology in agriculture, there are many research and development projects paving the way for digital platforms. These platforms build a basis for more smart services as well as for new possibilities for start-ups to revolutionize and influence the entire sector. In the course of the development, more and more parties outside of the sector get involved and try to find new economic niches to participate in the digitalization of agriculture. In order to cope with the new situation and profit from it, companies have to be agile and adjust to changes. Innovation culture may be one essential component to ensure these qualities.

1.2 Motivation and Objective of the Thesis

As data is considered the most important raw material of the 21st century (Kagermann et al., 2015, p. 14), evaluating the potential offered by it seems like an interesting and reasonable task. The technological trend in agriculture is representative for developments in all sectors and industries and is therefore connected to innovation. This thesis aims at providing insight into the current state-of-art technology in agriculture and presenting reasons for the importance of smart services and digitalization in agriculture. The main objective is to identify ways in which innova-

tion culture affects smart services in agriculture and to design a reference architecture illustrating the factors. Along the way, future trends will be highlighted giving insight in what smart services henceforth may contain. Altogether, the results derived from analyses of the literature and expert interviews open up new perspectives on the importance of an innovation based corporate philosophy in digital era.

1.3 Structure of the Thesis

The following figure gives a broad overview on the structure of the present thesis and includes main components and milestones.

Figure 1: Extract of the Thesis' Structure

Source: Author's Illustration

The second chapter of this thesis creates a basis for the posterior analysis. For this purpose, the fundamental terms innovation culture, big data, smart data, and smart services are defined and explained. Further, the projects Smart Service Welt and Smart Farming Welt are introduced to underline the topicality as well as necessity of the topic. In the next chapter, the applied methodology including the literature review based on Webster and Watson and Mayring's qualitative content analysis are described. The main part (chapter four) addresses the current economic and technological state of agriculture and finally focuses on the different influencing factors on smart services. These results base mainly on information derived from expert interviews which are complemented by the findings of the literature review. In the fifth chapter, the outcome of the expert interviews, literature review as well as the reference architecture are discussed and recommendations are formulated. After stating limitations, a conclusion is drawn and further research possibilities are proposed.

7. Conclusion and Further Research

Farming in present days most evidently does not mean technological backwardness. AMMs are currently taking part in the transformation from supplying products to supplying services. This transformation requires flexibility and openness towards new developments. IC with its values provides the basis for these changes. From the point of view of an AMM, customer orientation is key to ensuring competitiveness, which is, i.a., a reason why smart services are offered. As smart services are a fairly new concept, IC supports the further development of the latter as failures are not feared. Concerning smart services, two aspects of IC can be considered the most important: on the one hand, IC in combination with a customer-centric approach ensures the correct interpretation of the customer's needs which is crucial for finding satisfactory solutions. On the other hand, IC is the basis of coming up with new, innovative ideas which can then be transformed into smart services. Without the freedom and support on parts of the management, innovative services would not be possible. Consequently, IC determines how flexible a company can react to changes and how fast it can realize solutions for their customers. The content of those services is nonetheless defined by the needs and demands of the customer.

For future research, the influence of IC on smart services could be extended to other countries as well. Especially the USA are pioneers in terms of service related innovations and could thus provide a new insight on the topic. Moreover, outcomes of current research projects, such as the Smart Farming Welt, could be analyzed in order to determine whether there have already been changes in the provided smart services or what these services are most depending on. In order to complement the present thesis, more players in the AMI, particularly start-ups, could be interviewed with the objective to identify the background of their approaches as well as compare their IC to the ones of established AMMs. Furthermore, data security has only been briefly addressed in the thesis but is of high importance with regards to future innovations and services. Data security, therefore, needs further research in this relation as well. In order to optimize and design the reference architecture more detailed, further research could contrast companies of different innovation cultures to eventually extract the influence of individual innovation-related values.

Taking into account, that today, the development of smart trends has just emerged, the upcoming years will be even more insightful in terms of the research question of this thesis. As product release cycles become shorter, customers' demands become more complex, and technology opens up even more opportunities, it will soon become apparent which companies and which innovation-related values are beneficial and capable of ensuring persistence in this changing economic sector.