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HANDELkompetent – Situation Aware Learning in Retail

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Abstract

Digitization is a megatrend which affects all industries. But how does this affect learning on the job scenarios. The research project HANDELkompetent aims at digitization of work process integrated informal learning in retail with a methodological approach and a supporting digital learning environment. The method consists of an accompanied learning approach, where a dedicated person schedules the development of competences of staff in dialog. Learning content consists of small web-based trainings, i.e. learning-nuggets, which can be consumed in a few minutes. The learning environment is enhanced with a tablet pc app, which presents learning content to a learner. The app is enabled to deliver appropriate content to the learner by recognizing the learning situation by making use of device sensors, the actual competences of a learner and the target competences as registered in the learning environment. That means in detail that a learning position, e.g. cash point, warehouse or sales floor is tagged with iBeacons. Those iBeacons broadcast their identification via Bluetooth Low Energy. The tablet PC of a learner can identify these iBeacons and thus, the app determines the physical location of the learner. Besides the position the app can utilize microphone, camera or a brightness sensor for gathering context information, to derive the learning situation and to deliver appropriate content. We make use of the Digital Business Engineering Framework to structure our work. Digital Business Engineering is a methodological framework to deliver sustainable solutions for Digital Transformation. This paper shows our structural approach and first results of the development phase of the HANDELkompetent project.

1. Introduction

Retail is in Germany one of the major commercial sectors with a total revenue of more than 450 billion Euro, more than 370 000 companies and 3 million employees [1]. Most of these companies are small or medium sized companies 90 % have less than 10 employees. For those companies further education of their employees is challenging. On the other hand, innovative technologies are broadly available and accepted by users and new learning concepts, e.g. mobile learning [2], blended learning [3] or virtual classrooms [4] change the way of

learning. These changes are part of the current megatrend digitization. But the adoption of those trends and technologies require new methods and proceedings. The Digital Business Engineering method is one method that fits these needs. Digital Business Engineering is a holistic method for the development of digital services. An end to end customer process is the ultimate starting point. The method bases on mixed teams to achieve a comprehensive understanding of the problem, the needs and the solution. The Digital Business Engineering method is illustrated in detail in [5].

This paper presents the utilization of the Digital Business Engineering method in the research project HANDELkompetent as case study. HANDELkompetent integrates informal learning of employees into their daily business at work. Small gaps in the daily business are supposed to be used to further educate the employees with e-learning nuggets. This approach is followed by a cooperation of four project partners Fraunhofer Institute for Software and Systems Engineering ISST, Qualitus, systemkonzept and ZBB (Zentralstelle für Berufsbildung im Handel e.V.) together with several retail companies and public institutions as counseling centers.

As a result of this cooperation, a learning concept and a prototype are developed, which are evaluated with the retail partners in practice. The HANDELkompetent approach is described in this paper and in in more detail in [6].

The rest of this paper is organized as follows: Chapter 2 outlines related work to the HANDELkompetent approach. In chapter 3 the Digital Business Engineering method is introduced and its application to the project HANDELkompetent is presented in the Digital Business Engineering strategic perspective, process perspective and system perspective. Chapter 4 closes with first results and an outlook to further work.

2. Related Work

E-Learning becomes more and more popular as a concept to transfer knowledge. Between 2006 and 2014 revenues and the number of permanent employees in companies increased every year [7]. A study in 2014 of the "MMB-Institute for Media and Competence Research" (MMB-Institut für Medien- und Kompetenzforschung) showed, that 66 % of big firms, with more than 499 employees, utilize e-learning for (further) education of their employees [8]. These observations are justified with cost and time reduction for educating employees due to competition in business. Even the natural knowledge loss (e.g. special electronic data processing knowledge is only valid for about 1 year) [9] and the incorporation into work routines for new employees require methods like e-learning to achieve a fast and cost efficient knowledge transfer. The flexibility of e-learning is another benefit, in comparison with traditional learning concepts. Furthermore, traditional learning builds a wide and deep knowledge base, while nowadays there is a need for "learning on demand" with small and precise learn units [10].

In 2007, Uten et al. stated that the second generation of e-learning is emerging, being in contrast to the first generation "less content intensive and more context based, less pioneeristic and more aware of learners' needs" [11]. The aspects of user centric learning are nowadays present in e-learning environments for example in the form of competence management, like it is implemented in the e-learning platform ILIAS. Context awareness to support the efficiency of learning is also common and discussed in several researches like [12], [13] or [14].

As learning has evolved in the past years, many pedagogical methods were developed to fit new educational needs [15]. It is stated, that location, time, current activity and detailed information about the user becomes more important in mobile learning, because learning is now time and location independent [16] [17]. But there are no mechanisms or frameworks proposed to determine those parameters. In [17] several frameworks are analyzed, but none does fit those criteria. In HANDELkompetent we support most of those criteria. The context acquisition is stated as major challenge for context aware ubiquitous learning systems [17]. Furthermore exists algorithms and ontologies for recommender systems that propose situation or context aware learning content [18]. But those do not measure location information.

These aspects are taken into account in different leaning concepts like blended learning, virtual classrooms or mobile learning. Among these three concepts, blended learning is the widest spread and most used technique over the past 6 years (2009-2015) [3]. Blended learning combines e-learning-sessions with presence phases in real world classrooms. These classrooms nowadays are for example partly equipped with digital blackboards. Already several schools make use of Apples' iPads and appreciate the benefits of these technologies [19]. In contrast to blended