



FAKULTÄT FÜR INFORMATIK
DER TECHNISCHEN UNIVERSITÄT MÜNCHEN

Bachelor's Thesis in Information Systems

**Entwicklung eines Tools zur Überwachung der
Studentenleistung basierend auf technischen
Anforderungen für die Wirtschaftsinformatik**

**Development of a student performance monitoring
tool based on technical requirements for
Information Systems Education**

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Motivation

The Corona Virus has a major impact on educational institutions like schools and universities, which led to a transformation of a common education to new teaching techniques. Due to the overall situation, e-Learning education gained a lot of importance and most schools had to integrate the e-learning method into their educational methodology (Radha, Mahalakshmi, Kumar, & Saravanakumar, 2020). Even before the virus, universities practiced online platforms like e.g. Moodle, live streams of lectures, let students access materials without limitations.

E-learning platform also called learning management system, or course management system are defined as “a type of software application that enables instructors to deliver information to students, produce content materials, prepare assignments and tests, engage discussions, and manage distance classes over the Internet” (Mazza & Milani, 2004). Additionally, according to Baumgartner, Häfele, and Maier-Häfele (2002), there are five main areas in the e-learning platforms, present content, discussion forums, video conferencing and chat, assignments and tests, evaluate and assess student performance (Graf, 2007). In both definitions the consideration of a student performance monitoring tool is clear. To sustain a high-quality education in an e-learning platform, it is important to consider Bloom's taxonomy of cognitive learning objectives. Bloom's taxonomy defines six categories: Knowledge, Comprehension, Application, Analysis, Synthesis, Evaluation. Hereby the order of the categories also provides information, the complexity is increasing per category (Adams, 2015). Now take into consideration, that evaluation has a high complexity it shows the need for an additional monitoring tool integrated into CMS, where students and instructors can provide feedback to each other and reflect on their performances.

The SAP UCC provides and improves lectures or trainings for its customers with the usage of modern SAP products and technologies. Therefore, the team develops and maintains learning material in form of different curricula, that teach the concepts of business processes with the help of SAP-based systems. Hereby the theory is supported with case studies, lecturer's notes, and slide sets. The SAP UCC uses the data set of a fictive company called Global Bike Inc (GBI) so that the learners can identify more with the product and the complexity of the theory is broken down to more understandable concepts. In one of the curricula, this fictive company experiences a digital transformation process. The company, being a traditional manufacturer, cannot gain any profit from their IoT bikes, and thus changes the whole strategy and the business model to bike-sharing. The learners experience the transformation process and get an insight into the mandatory changes on different modules for every affected aspect of the fictive company – now called GBS (Global Bike-Sharing). Additionally, the usual ERP system does not fulfill the needs of the new company that's why it is also important to update it. The curriculum is separated into different learning modules, where the digital transformation process is explained in each affected aspect. The current state of the curriculum does not provide any type of monitoring of the performance of the students. The monitoring tool should provide the learners with information, let the students reflect their performance in tests/assessments so that a maximum learning effect is satisfied. In addition to that, the instructors should be able to see how well the learners are solving the tasks and give constructive feedback to the learners. The main goal is to gain in the quality of the education overall so that the learners can be prepared for a qualified future workforce.

Research Questions & Methodology

The Bachelor's Thesis is separated into different aspects. On the one hand, the reader gets information about the technical requirements, which are divided into functional, and non-functional requirements, and are conducted by literature, and existing e-learning platforms. This information will be tailored to the needs of the SAP UCC. On the other hand, this thesis will also deal with the actual implementation of the Monitoring Tool, whereupon there will be an evaluation of the finished prototype. After the implementation of the Monitoring Tool for the existing web-based ERP system, the system will be upgraded with a tool, which helps students and instructors reflect on their performance and improve themselves.

Research Question 1: *What are the technical requirements for a Monitoring Tool in an e-learning environment?*

At first, I will define the technical requirements for the monitoring tool, where I gather information from existing literature. Hereby I will be within the context of Webster and Watson (2002). In addition to the literature review, I will also try eliciting requirements out of existing e-learning platforms e.g. Moodle. I will be managing the requirements according to Rupp, Simon, and Hocker (2009) and tailor these to the needs of the SAP UCC. The last step is to create and present a product requirements document according to Teich (2008).

Research Question 2: *How can the elicited requirements for a Monitoring Tool in an e-learning environment be implemented?*

Here I will extend the existing system with the monitoring tool. For the implementation of the monitoring tool, I will use gathered requirements of RQ1 and support the infrastructure/concept with a class diagram for better understanding and overview. For the frontend implementation, I will use the SAP UI5 framework, since we are using ABAP as our backend development language. These development languages/frameworks are based on the existing system, which makes integration easier and more consistent.

Research Question 3: *How much does the developed Monitoring Tool fulfill the technical requirements?*

Lastly, I will evaluate the created prototype to what extent does it fulfill the gathered requirements in RQ1. Hereby I will make a survey and/or interview with the SAP UCC Munich team and customers, to argue and discuss whether the developed tool meets the requirements for the SAP UCC and if there is still room for improvement.

The Thesis will have a timespan for 5 Months starting at 15.05.21. First, I will conduct the literature review from RQ1 to create the PRD. Additionally, I will familiarize myself with SAP UI5 and ABAP, whereas I have some knowledge about the ABAP programming language from my working student job. After completing RQ1 – probably end of June –, I will focus on the implementation of the prototype until early August. Afterward, I will do the evaluation of the prototype and implement improvements or correct any type of bug fixes. Lastly, I will be writing the thesis itself for about a month.

Differentiation

Additionally, the implementation of the prototype will be divided between Henryk Mustroph and me. Hereby it is important to note that Mr. Mustroph is working on his own thesis. His research methodology and field focus on the didactic and the internal logic of the monitoring tool, whereas I am focusing on the technical requirements. The different aspects of the implementation process will be divided between me and Mr. Mustroph. He concentrates on “Materials Management” and “Finance & Controlling”, whereas I focus on “Enterprise Asset Management” and “Production Planning”.

References

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