Teaching the Digital Transformation of Business Processes: Design of a Simulation Game for Information Systems Education

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Abstract. The ability to manage business processes in the context of the digital transformation is a key competency that should be addressed in Information Systems (IS) education. One possibility for teaching this competency is through simulation games, but the current ones lack a dynamic view on changing business processes induced by the digital transformation. In this paper, we present the design of a simulation game to teach the digital transformation of business processes within IS education. The game simulates the transformation of a bike manufacturing company to a bike-sharing provider, in which students have to manage changes in the production process in teams during different transformation phases. We argue how our game supports central learning objectives for teaching the aforementioned topic and show the benefit of our game design by running a pilot test with students from IS education using the Systems Usability Scale to evaluate the utility of our implementation.

Keywords: Simulation Games; Game-based Learning; Digital Transformation; Business Processes.

1 Introduction

Digital technologies are becoming a main driver for changes in today's companies. The combination of information, computing, communication, and connectivity technologies fundamentally transforms business strategies, products and services, or business processes of an organization [1]. This implementation of digital technologies goes beyond an increase in the efficiency or effectiveness of current processes and leads to changes in the way a company operates, which is defined as "digital transformation" [2]. A core part of this transformation is to manage the business processes and their changes induced by the current technological developments [3, 4]. To prepare students for their future working environment, these changes require adoption by academia, such as including current trends and technological developments of the digital transformation into the curricula. Based on the previous analysis by Prifti et al. [5], business processes and their change management can be seen as a core competency for

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the future workforce to be competitive in this dynamic environment. Therefore, teaching the digital transformation of business processes is a highly relevant topic for Information Systems (IS) education.

However, in current IS education, specific concepts for teaching the digital transformation of business processes are still missing [6]. As previously stated by Jeyaraj [7], changes of business processes should not only be taught to students in a theoretical manner, but also be experienced by the students. Therefore, Jeyaraj [7] proposes to use a simulated environment for teaching the topic in a more experiential way. Despite the importance of providing enough practical insights into the effects of business process changes, a detailed solution to experience these changes is missing [8, 9]. A promising approach to achieve this are simulation games, which model parts of the reality and simulate dynamic situations based on the model [10]. A simulation game would provide the ability to imitate process change scenarios with students in a classroom environment [11]. However, current simulation games that focus on business processes, such as the simulation game called ERPsim [12], are geared towards static business processes instead and are not designed to simulate dynamic business processes [12, 13]. Hence, there is a need for a simulation game to teach the digital transformation of business processes from a practical perspective.

In order to address this, we present the design of a simulation game to teach the aforementioned topics. Building upon previous findings for teaching business processes in the context of the digital transformation, we provide practical scenarios for experiencing changing business processes. We use a bike manufacturing company as an example and provide a storyline in which the company transforms to a bike-sharing provider. In the course of the transformation, the production process changes, and students playing the game will have to take different actions to manage the process. We argue whether such a game supports the predefined learning objectives when teaching the digital transformation of business processes and evaluate the game by using it in a pilot test with a group of students from IS education. In summary, the main objectives of the study are to design the simulation game and to show its utility for teaching the aforementioned topics in IS education.

The rest of the paper is structured as follows: First, we present related work in the area of simulation games, business processes, and teaching in the context of the digital transformation. Afterwards, we present our research approach for the design and development of the simulation game. As the core of the paper, we present both the didactical and technical design of the implementation. Finally, we present the results of an evaluation with students from IS education using the Systems Usability Scale (SUS) to show the utility of the implementation.

2 Related Work

Simulation games have a long history in various disciplines. While the initial focus was on simulations in the military or economics, it changed to the usage of simulation games for education in business over the last decades [14]. In IS research, this "gamification" becomes more and more important [15] and various examples for simulation games to serve specific goals of IS education exist. For instance, Baume [10] presents a simulation game to teach information management based on the example of the tasks of a Chief Information Officer. The game is based on the structure for simulation games by Kern [16] and consists of a preparation, interaction, and evaluation phase. Thereby, it is shown that the game provides a useful method to teach information management to students. Another example is the work of Léger [12], who presents a simulation game called ERPsim, which teaches the execution of integrated business processes based on a real Enterprise Resource Planning (ERP) system from the software manufacturer SAP. Moreover, Grund & Meier [17] argue that there is a lack of simulation games to teach business information visualization in IS education and a respective game is developed in a following research project [18]. In summary, these games provide useful methods to teach IS content to students. However, they do not contain a dynamic aspect in which students have to adapt to a changing business environment.

In general, handling changing business processes is not a novel topic that arose in the context of the digital transformation, but has been a topic of IS research for a long time. Leading corporations have used the management concept of Business Process Change (BPC) to manage their processes and the resulting changes induced by current developments. Overall, BPC involves any type of process change, either revolutionary or evolutionary [19]. There has been previous research on the impact of BPC on the success of BPC projects [20] and their dynamic complexities [21], but this was geared toward researchers and practitioners. However, it was already mentioned that an integration of the findings into a simulation game could be a fruitful avenue for future research [22]. In the context of the digital transformation, BPC becomes an important concept, as the restructuring of business processes is a core task within the transformation [3, 4]. Therefore, it is also a topic of high interest for IS education [5].

When it comes to teaching BPC, Jeyaraj [7] proposes use of a simulated environment, as this allows students to experience the impact of changing business processes. In this environment, students can simulate the elicitation, modeling, and reengineering of business processes using role-playing activities. For the context of the digital transformation, where BPC becomes a core competency for the future workforce [5], a previous work [6] analyzes requirements for teaching BPC, which include making decisions on the design, execution, and redesign of business processes using a modern ERP system and user interface. In addition, another work compares two prototypes for simulation games that focus on the digitization of business processes [23] and therefore provide basic insights on the development of simulation games in this context.

3 Research Approach

For the development of our simulation game, our research applies the design science approach according to Peffers et al. [24], additionally considering the guidelines from Hevner et al. [25]. In general, we follow their methodological steps that involve the following activities [24]:

1. **Problem Identification and Motivation.** As previously stated, there is a need for more practical approaches such as simulation games for teaching the digital

transformation of business processes in IS education. This fact can be strengthened by considering the experience in IS classes with teaching the digital transformation of business processes. Focus group discussions with lecturers from the IS context, such as the ones conducted by Prifti et al. [5], showed that teaching in the context of the digital transformation requires different learning strategies and curricula, which are not yet covered in traditional IS courses. More specifically, further focus groups highlighted that simulation games offer the possibility to teach behavioral competencies such as teamwork, competition, and decision making [6], which is difficult to address with traditional teaching methods. Therefore, simulation games are highly suitable to teach the digital transformation of business processes to students in IS education and to provide them with a more practical perspective.

2. **Definition of Objectives for a Solution.** As our planned solution is a simulation game for education, the central objective is to reach learning outcomes with our game. In general, students can achieve learning outcomes at three different levels, which are the institutional, program, or course level [26]. In our case, we focus on the development of a simulation game for an IS course and therefore develop learning outcomes on course level. For this, Biggs developed the Structure of the Observed Learning Outcome (SOLO) taxonomy, which defines action verbs for learning outcomes based on five levels [26]. However, as the verbs in the taxonomy are limited, we also considered the revised Bloom's taxonomy as recommended by Anderson & Krathwohl [27] for the definition of learning objectives for the simulation game. In our case, this taxonomy is highly suitable, as it provides action verbs for a range of learning activities [26, 27], which is necessary to cover all tasks in the simulation game. Hence, we define the relevant learning objectives for our solution based on the action verbs from the revised Bloom's taxonomy [27].
3. **Design and Development.** Based on the learning objectives, we iteratively developed a prototype for our simulation game. This prototype serves as design research artifact whose desired functionality is to address the previously defined learning objectives, according to the approach from Peffers et al. [24]. Based on this, the technical architecture was derived and the artifact was created in iterative development rounds. As described by Hevner et al. [25], an iterative development of the artifact helps to get immediate feedback on the design in the construction phase and supports the creation of an artifact that satisfies the requirements that it is meant to solve. In our case, we built a project team that consisted of four people and met every two weeks. From the fourth week on, we had a running prototype of our simulation game that we discussed and extended iteratively. After four months, the final prototype of the simulation game was ready for the first user tests. At this stage, we were able to compare the artifact's functionality with the previously defined learning objectives it should address.
4. **Demonstration.** To demonstrate our artifact, we conducted a pilot user test with 13 students from IS education. During this test, the participants played the game in a 90-minutes session. Therein, we introduced the company and its digital transformation to the players, explained the process they have to manage, as well as the game rules and its user interface. Afterwards, the participants played the game, in which course they worked with the artifact in order to be able to evaluate it later.

5. **Evaluation.** In the previous design and development phase, we argue whether the game has potential to teach the digital transformation of business processes effectively. In order to evaluate this with a quantifiable measure, we used the questionnaire of the SUS by Brooke [28] for the technical aspects of the game. The SUS is an easy to use scale to measure the usability of a system or product, which covers the effectiveness, efficiency, and satisfaction of a user when working with a system. It consists of a ten-item questionnaire, can be used on small sample sizes and still provides reliable results [28]. In our case, with this measure, the students can give feedback on the usability of the simulation game and we can analyze the utility of our artifact for teaching the aforementioned topic.
6. **Communication.** The communication of the results is fulfilled within this article.

4 Game Design

4.1 Learning Objectives

The central goal of our simulation game is to prepare IS students for their future working environment by gaining a deeper understanding of the digital transformation and its effects on a company's business processes. To derive specific learning objectives for this overarching goal, we analyzed learning objectives in the literature for simulation games in IS education and related disciplines. The literature review has been structured according to the methodology proposed by Vom Brocke et al. [29]. We considered databases including IS and education outlets, such as the IEEE Xplore Digital Library, SpringerLink, the ACM Digital Library, and the AIS Electronic Library. In these databases, we searched for learning objectives in IS education that can be applied on simulation games for business processes. Furthermore, we considered previous analyses on competencies in the context of the digital transformation, such as change management, understanding and coordinating workflows, decision making, and teamwork [5]. Based on the results, we built ten learning objectives that define what the students should learn after playing the game. These objectives are defined based on the revised Bloom's taxonomy [27] and are listed below, clustered by the different activities in the simulation game. After playing the game, the students will be able to

1. … explain the described process and its sequence of process steps [30]
2. … illustrate the interdependencies between different process steps [31, 32]
3. … explain the impact of the digital transformation on the business processes [5, 6]
4. … explain the digital transformation in the production process [5, 6]
5. … explain the challenges of BPC in the context of the digital transformation [6, 33]
6. … develop a strategy for profit maximization based on the current market demands [34]
7. … adapt and change the described process according to the developed strategy [35]
8. … analyze and solve problems in a team [5, 6, 36]
9. … make decisions in a changing and competitive environment [6, 30]
10. … critically evaluate one's own decisions and their impact [6, 36]

4.2 Game Scenario

The game scenario is based on previous research in BPC, simulation games, and the digital transformation. Based on the literature, we derived fundamental principles and technical requirements for the implementation of the simulation game. Furthermore, following the design science approach as previously described, we iteratively discussed the game design and its technical requirements. Overall, this led to the following fundamental principles for our simulation game:

- The students work together in teams and compete against other teams in a common market [6]. Collaboration within the team is thus required to manage the game successfully [37, 38].
- The central tasks in the game comprise decisions regarding changing business processes induced by the digital transformation [39]. The students should divide tasks among their teams to analyze the different decisions, discuss them, and come up with a common solution afterwards [40].
- For all decisions, the students work with the interface of a modern ERP system, in this case SAP S/4HANA, in order to analyze the different alternatives and make decisions based on a real ERP system [6, 8, 33, 40].

We embedded the game into the storyline of a bike manufacturing company, as this is a frequently used example for a model company in education to teach business processes [41]. Especially in the context of the digital transformation, this storyline is highly suitable for students in IS education, as it provides a concrete example for an industry affected by the digital transformation, which can still be easily understood without extensive technical knowledge, e.g. about production processes. Our main idea was inspired by findings in the literature that see the Internet of Things (IoT) as an important concept when teaching the digital transformation [42]. Furthermore, the combination of products and services in a rental model, also called Product Service Systems (PSS), is an important topic for teaching changing business processes [43] and therefore is also considered as part of our game.

In our game, we use the scenario that a bike manufacturing company decided to introduce a new bike with IoT components to the market. In a first step, the new bike received positive feedback from test customers, who really liked the new IoT components. Therefore, the company reorganizes the production process to bring these new bikes to the market. However, despite positive customer feedback, the company is experiencing problems with the sales numbers due to the high product price of the IoT bikes. To address this problem, the executives decide to extend the company's business model and to offer bike-sharing services to private customers on the top of the current business. For this, additional components for the bike, e.g. an onboard application to manage bike rentals is necessary. Overall, the tasks within the game comprise the management of the necessary changes within the production process and ensuring that the new business model is running properly.

Overall, the different changes the bike company undergoes in the digital transformation are split up into four phases of transformation, which are depicted in the game in four rounds:

1. **Phase 1**. There is an initial demand of 10.000 bikes on the market. The teams have the possibility to buy additional assembly lines for production of the new IoT bikes and determine a price for their sales.
2. **Phase 2.** The demand increases to 60.000 bikes and the teams can now introduce quality management to improve the production process. Furthermore, new automatic assembly lines can be bought to increase the production capacity.
3. **Phase 3.** The bike company decides to offer bike-sharing services with their IoT bikes. Therefore, the demand increases to 350.000 bikes. The teams have to integrate application development into their process to be able to offer the bike-sharing services. Additionally, they can buy new assembly lines using predictive maintenance, which have a higher capacity and lower rejection rate.
4. **Phase 4.** In the final round, the demand is 400.000 bikes. The teams can introduce additional sales and distribution channels for their offerings and need to establish their offerings in competition with the other teams.

As basic process for the described scenario, we use a bike production process that consists of ten steps. As a foundation, we used a sample production process for bikes as described by Magal & Word [41]. However, we additionally considered the attachment of IoT components to the bike during production, such as sensors, a motor, or a battery [44]. This leads to the business process in Business Process Model and Notation (BPMN) shown in Figure 1.

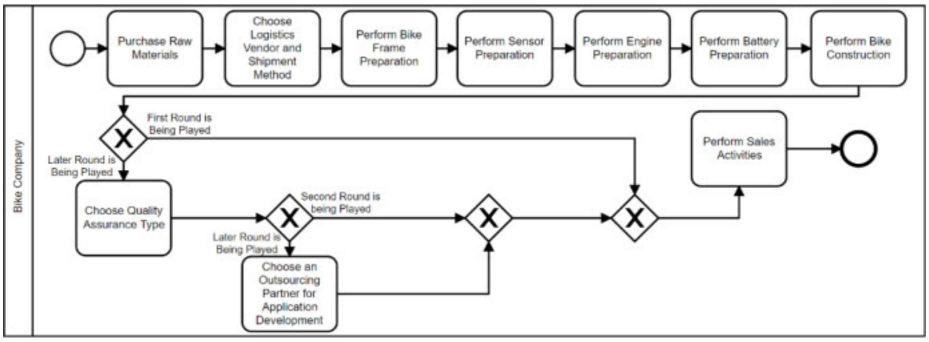

Figure 1. Process Scenario for the Simulation Game

First, there is the purchasing of raw materials, in which the teams can choose between different vendors offering the required materials and can decide which quality they should have. This is followed by logistics, which comprises company-internal logistics and allows the teams to choose between different shipment methods. In the next four steps, which are frame, sensor, engine, and battery preparation, the participants have to choose between different assembly lines. In each transformation phase, new assembly lines can be bought, depending on the current state of the digital transformation. This provides the ability to choose production lines with different capacities and align the production capacity to the overall demand on the market. As the seventh step, the bike construction follows, in which the teams can again select from different types of assembly lines. However, this step is very important, as it determines the final number of bikes the company will produce. Afterwards, there is quality assurance, which does not exist from the beginning, but can be implemented in the second transformation phase and improves the quality of the bikes. The ninth step is application development, which becomes important when the bike company decides to offer bike-sharing services in the third transformation phase. There, the teams have to choose an outsourcing provider for application development in order to manage bike-sharing services with their IoT bikes. Finally, there are the sales activities, which determine the price of the bikes and allow additional decisions that have an effect on the revenue, such as introduction of new distribution channels or sales branches. This last step also determines how many bikes are sold at the chosen price and therefore results in the overall profit of the company.

4.3 Technical Implementation

From a technical perspective, the application is based on the SAP ABAP (Advanced Business Application Programming) technology stack. It consists of three main components, which are the frontend, developed with the JavaScript framework SAPUI5, the backend, developed in ABAP, and an underlying SAP HANA database. The frontend consists of two subcomponents: administration and game. The first one can only be accessed by the instructor and is used to create a new game and to start the round simulation after the player entries have been confirmed. The players interact with the second subcomponent after they have been assigned to an active game. The frontend communicates with the backend for loading of master data, such as material data or vendor data, as well as for game data and round data submission.

In the design of the user interface, we followed the customer-centered approach as described by van Duyne et al. [45] to assure that all the game features are built in an understandable way. First, we have designed our user interface responsively, so that the game can be played using computers, tablets, and mobile phones. We divided the home page into a main section and navigation section, following the navigation bar pattern by van Duyne et al. [45]. From the main area, the players can access every process step shown in the process scenario in Figure 1. A side bar is used for navigating to the round results and to the help page, which describes the game rules and the differences between the rounds. The upper bar contains a button to end the round. Pressing it will disable the ability to change the decisions and will notify the instructor that the team the player is assigned to is finished with the current round.

For every process step, we developed a unified design, consisting of a header area and a decision-making area. Figure 2 shows this on the example of the "Frame preparation" process step. The header area consists of three sections: previous round data, showing the player's decisions from the last round, current round data, showing what values have been saved for the current round, and cost accounting data, showing the influence of the player's decisions on the budget, running cost, and total quality of the product. The header area also has the navigation button that returns the player to the home screen. The decision-making area is located under the header and has several input fields that have to be filled in by the player. Each field has a help button that briefly explains its meaning. All changes the players make are also reflected in the live cost accounting section. These values should aid the player through decision making by showing the impact of their decisions without having to save every change. The data needs to be saved only when the player is satisfied with his or her decisions and it is done by pressing the "Confirm" button in the footer of the page. The interface of the game also includes videos that explain the introduced innovations, e.g. robotic quality assurance or predictive maintenance. Located to the right of the live cost accounting, these videos are aimed at providing the player with better understanding of digitalization and automation and thus increasing the didactic value of the game.

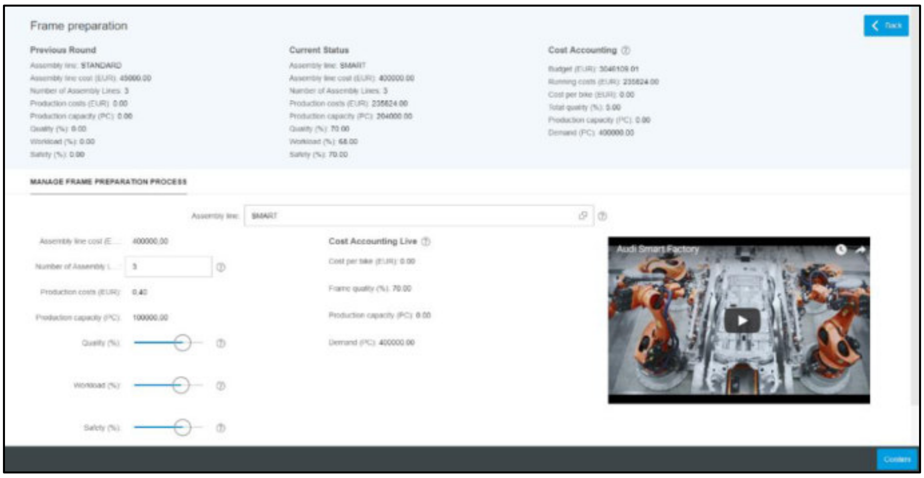

Figure 2. Sample Process Step of the Simulation Game

4.4 Fit Between Learning Objectives and Game Scenario

During the design and development of the game, the main goal was to implement a solution that addresses the learning objectives for teaching the digital transformation of business processes as described in Section 4.1. Table 1 illustrates the fit between the Learning Objectives (LO) and the game scenario from a conceptual perspective.

As illustrated, all learning objectives are covered by different aspects of the game scenario. LO1 and LO2, which focus on explaining and illustrating the business process and its interdependencies, are mainly addressed by the visualization of the basic process scenario in the starting screen of the game. Furthermore, common KPIs for all process steps, e.g. production capacity, create dependencies between the steps that the students have to understand to be successful in the game. LO3 to LO5, which focus on explaining the digital transformation in different contexts, are mainly met by the different activities that are available dependent on the transformation phase. In each phase, new technologies such as smart production lines become available, which have an impact on the efficiency and overall profit in the game. Additionally, new activities have to be handled by the students that are necessary to sustain the profitability, e.g. managing the quality assurance from the second phase on. As general rule, in each round, a new process step appears, which defines the current transformation phase and has to be managed to get a competitive advantage in the game. LO6 to LO8 focus on developing a strategy, adapting and changing the process accordingly, and analyzing and solving problems in a team. These learning objectives are addressed by a changing market demand based on the current round, which is accompanied by further changes regarding the business processes that have to be managed by the students. For this, teamwork is necessary, as new process steps become available in every round and tasks have to be split to react to all changes accordingly. Finally, LO9 and LO10 focus on making decisions in a changing environment and critically evaluating the impact of the decisions. For this, the demand changes in a flexible way based on the number of teams and the participants have to make decisions under time pressure to be competitive. Furthermore, the user interface provides a results screen, which allows students to evaluate their decisions and to reconsider their strategy for the following rounds.

Table 1. Fit Between Learning Objectives and Game Scenario

Learning Objective	*Aspects of the Game Scenario*
LO1	• Process presentation in the preparation phase of the game • Basic process scenario illustrated in the starting screen
LO2	• Interdependencies between the process steps through common KPIs
LO3	• Presentation of IoT components in the preparation phase • Impact of transformation phase on available process steps
LO4	• Impact of technological developments on the production capacity in the game
LO5	• Changes within process steps allow for more process efficiency • New process steps allow for more profit in the game
LO6	• Changing market demands based on the current round • Gameplay allows clear strategy for profit maximization
LO7	• Changes within process steps necessary in every new round • Additional process steps available in every new round
LO8	• Teamwork as fundamental principle of the game • Each team member is required to make decisions
LO9	• Demand changes based on number of teams • Limited time for decision making during the game rounds
LO10	• Results screen for each team to analyze decisions • Different strategies possible to win the game

Overall, regarding the revised Bloom's taxonomy for the definition of learning objectives, all categories are covered with the design of our simulation game. The taxonomy defines six cognitive processes, which are called Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating [27]. While the majority of the learning objectives can be assigned to the processes of remembering (LO1 and LO2) and understanding (LO3-LO5), also applying is covered by our simulation game (LO7). Moreover, the process of analyzing is covered by LO8 and evaluating by LO9 and LO10. Finally, the process of creating is addressed with LO6. However, regarding Biggs' SOLO taxonomy, not all levels are covered by the game.

This taxonomy defines five levels of students' understanding. According to Biggs & Tang [26], four of them can be described with learning objectives, which are called the unistructural, multistructural, relational, and extended abstract level. Regarding the learning objectives of our game, the unistructural (LO1, LO3), multistructural (LO2, LO4-LO6, LO8 and LO9), and relational level (LO7, LO10) are covered. However, the extended abstract level is not addressed, meaning that the current game design is limited to the fact that students get a practical experience within the mentioned topic, but may not be able to transfer their experience to a theoretical level with the current version.

5 Results

5.1 Evaluation Scenario

For the evaluation of our simulation game, we conducted a pilot test with 13 students from IS education. The students were selected randomly from different courses in the IS master program and participated voluntarily. The age of the participants was between 19 and 37 and all of them had a basic understanding of business processes and the term "digital transformation" from previous lectures in their study program. We used a questionnaire including the SUS by Brooke [28] to evaluate the technical design of the game. The SUS is a reliable tool to measure the usability of a system or product and is valid to differentiate between usable and unusable systems [28]. It can be used on small sample sizes and still provide reliable results with regard to the usability of a system [28]. In our case, the SUS is beneficial as it provides a valid result for the utility of our simulation game despite the small number of participants in our pilot test. Based on the results, we can draw conclusions on the technical maturity of the implemented prototype and get a valid measure for the proper design of our game.

Overall, the pilot test took 90 minutes and consisted of three phases, inspired by the structure for simulation games proposed by Kern [16]:

1. **Preparation Phase.** In this phase, first the storyline of the bike manufacturing simulation was explained. The basic process as presented in the previous chapter was explained, as well as the new IoT components that can be added to the bike. Then, the game rules with four rounds, competing teams in a common market, and the fact that the team with the highest profits wins the game were described. Finally, the user interface was introduced to the participants, in order to prepare them for the first round. Overall, this introduction phase took about 20 minutes.
2. **Interaction Phase:** In this phase, the students played the four rounds with the different transformation phases as described in Section 4.2. Before every round, a short introduction to the available decisions was given. Afterwards, the students had ten minutes to make their decisions. After every round, a brief discussion of the intermediate results followed. Overall, the interaction phase took 60 minutes, with about 15 minutes per round.
3. **Evaluation Phase:** After the students played the game and discussed the results, they were asked to fill out an online questionnaire including the ten questions of the SUS. Afterwards, the pilot test was finished.

5.2 Evaluation Results

In general, the students rated the game very positively. The mean score of the SUS was 76.35, with a standard deviation of 11.59. Figure 3 shows the percentile ranking for all SUS scores of the 13 participants.

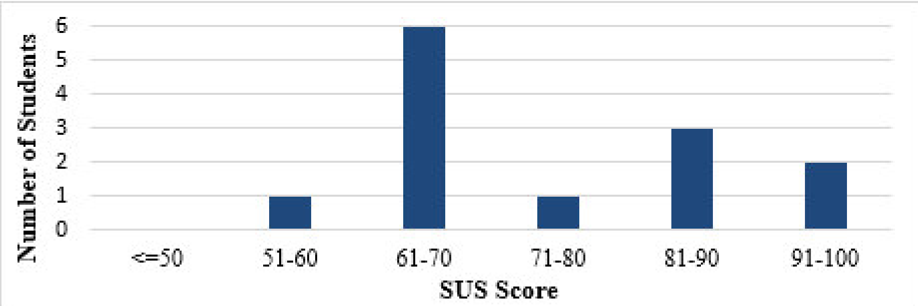

Figure 3. SUS Scores for the Simulation Game

The mean SUS score lies above the average of 68 and therefore is considered a good score [46]. According to the adjective rating score by Bangor et al. [47], the simulation game lies between "good" and "excellent". This indicates that our implementation in this state already has a good technical maturity. Most of the students agree that the simulation game is satisfactory and provides a good usability without needing much help of an instructor, which strengthens the purpose of using the simulation game as a learning system. Moreover, as the SUS not only serves to evaluate the usability, but also the learnability of systems or products [48], we can further derive that our implementation in general facilitates learning. Regarding the previously derived learning objectives, the results from the SUS does not allow drawing conclusions whether the students reached the single learning objectives. However, considering the results as feedback on the technical implementation, we can conclude that the game in general addresses the learning objectives with its technical functionalities. Therefore, the students' feedback through the SUS shows that the simulation game supports the purpose of teaching digital transformation of business processes.

6 Conclusion

In this paper, we have presented the design of a simulation game to teach the digital transformation of business processes within IS education. As basis, we derived learning objectives for teaching the mentioned topic from the literature and defined them for the purpose of our simulation game. The game was built based on the scenario of a bike manufacturing company that undergoes a digital transformation to a bike-sharing provider. We described the game scenario and the technical implementation in detail and argued whether the game design supports the predefined learning objectives. Thereby, we showed that our game is designed to address all level of the revised Bloom's taxonomy and supports the learning experience for students regarding the digital transformation of business processes. However, considering Biggs' SOLO taxonomy, our game design currently lacks the transfer of practical knowledge within the mentioned topic to a theoretical level. Hence, the current game design mainly aims to support students in getting practical experience with the digital transformation of business processes. In order to take the knowledge to a theoretical level, the game design has to be extended including more reflection by the students or a link to related research or literature focusing on further aspects of the digital transformation. Nevertheless, an evaluation using the SUS with 13 students from IS education showed the utility of our implementation from a technical perspective and the support of our technical solution to reach the defined learning objectives. However, a conclusion whether the single learning objectives have been reached by the students is not yet possible. Hence, a more extensive evaluation with a higher number of students can provide further insights on the achievement of the learning objectives. For example, this can include an assessment in which the students have to show their acquired knowledge after they played the game. Moreover, as further evaluation, observations by experienced lecturers may be suitable to measure the learning experience.

In conclusion, with this work, we propose a method for teaching the digital transformation of business processes from a practical perspective. The game can be used by lecturers in their practical courses and thereby extend the learning experience of their students. Furthermore, it provides a recommendation how teaching in the context of the digital transformation can be enriched with more interactive methods. Thereby, we contribute both to the theory of teaching business processes in IS education and to practice by providing concrete guidelines to teach the digital transformation of business processes using a simulation game.

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