(Playing) Government beyond Pen & Paper: Conceptualization, Implementation, and Outlook

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Abstract. In a world of ever-rising political, social, and economic uncertainty digitalization appears to be one of the few constants. Public administrations—often perceived as the stronghold of traditionalism and bureaucracy—are facing increased pressure to provide digital services. The dire need for managers and clerks with corresponding eGovernment competences paved the way for new study programs and training courses. As some competences are hard to convey via frontal teaching, innovative concepts such as simulation games are gaining popularity. However, we posit that teaching eGovernment competences with pen and paper alone appears to be an almost ironic reference to current administrative working patterns. Hence, this paper sets forth to present a concept and implementation for an online platform to support various eGovernment simulation games. We also plan to use the game data to gain further insights into the proficiency profiles of participants to derive optimized simulation scenarios.

Keywords: simulation game, eGovernment, competences.

1 Introduction

Competences of civil servants are one factor contributing to the successful implementation and execution of eGovernment services [1, 2]. Actions taken to raise the necessary employee's skills in public entities include training of experienced employees but also the development of study programs focusing on eGovernment [3]. These (under)graduate programs aim at filling the lack of interdisciplinary personnel who combine the knowledge of the special legal framework and role of public administration as well as information systems. They can further address public-private differences such as laws, stakeholders and value orientation [4, 5]. A promising approach to give students practice-oriented insights into this complex mesh of stakeholders and the unique tasks of public bodies is the setup of a simulation game (SG).

Even despite recent developments in the simulation game area [6], the focus is still often on pen and paper execution. This not only counteracts the goal of teaching digital-savvy administrative personnel but also largely ignores a multitude of educational developments: e-learning, mobile learning and the more general distance learning [7, 8]. Beyond these important pedagogical aspects, pragmatic ones like execution and management efforts remain as major inhibitors in traditionally executed SGs.

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Consequently, our research objective is *the development of a configurable platform for simulation games tailored to the public administration domain*. Thereby, this platform expands the current toolset and media used in teaching because, first, its design will explicitly encounter for the rising demand for digital and flexible tools in higher education. Second, the platform is not limited to the use in academia but can also be applied to train civil servants in the functioning and establishing of eGovernment.

2 State of the Art

The constantly evolving digitalization has a direct influence on the demanded capabilities and skills of employees in almost every business sector [9]. Especially the public administration with its often complicated and slow introduction of eGovernment services has a high interest in employees with a broad set of abilities related to both, the administration domain and digitalization—referred to as competences. Even despite serious debates on the characterization of competence, there is a substantial consensus to define competence as a set of personal skills and abilities within the cognitive, functional and social dimensions [10]. More specifically, in the public administration domain competence is subdivided into the categories *technical*, *socio-technical*, *organizational*, *managerial*, and *political-administrative* each linked to competences with a more narrow description like “expertise in eGovernment impact”, “process management competencies”, or “expertise in legal framework” [11, 12]. The presence of these competences contributes to the success of eGovernment endeavors [1, 2].

A recently published approach by [6] to build up these competences utilizing an SG expands the teaching tools for the public administration domain. For the execution of this simulation game, [6] propose to use the concept of "blended learning" combining the advantages of presence and distance learning alternatives [13]. Thereby, the game setting addresses in particular *socio-technical*, *organizational*, *managerial*, and *political-administrative* skills as well as soft skills. While this game contributes to extend the learners’ competences [6], it lacks a corresponding digital image of the SG. However, studies related to other settings found that SGs contribute to a good learning result [14, 15], which can especially be gained through the use of interaction platforms [16]. Exemplary cases for the implementation of a simulation game platform are already available for the BPM area [17] but not yet designed for the area of eGovernment and not recognizing the possibility to evaluate the current competences of partaking learners via application of competence mining [18–20].

3 Technical Concept & Demo

To fulfill our set research goal, we propose an abstract architecture allowing us to host the game proposed by [6] and any structurally equivalent game catering specific competence training goals. As a first step, we created a conceptual model to structure both the simulation game as well as the platform hosting it. The red part of Figure 1

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represents the technical-conceptual structure of the eGovernment simulation game proposed by [6][1]: We have a set of roles that can be involved in a set of events, carrying out role-specific tasks (RST) in each of the events. Each of the roles, events, and RSTs (not tasks!) can be assigned one or multiple additional descriptive elements. While we did not model the feedback elements such as interviews and reflections explicitly for the sake of simplicity, they can be considered as a special task type allowing for both event-specific as well as general responses.

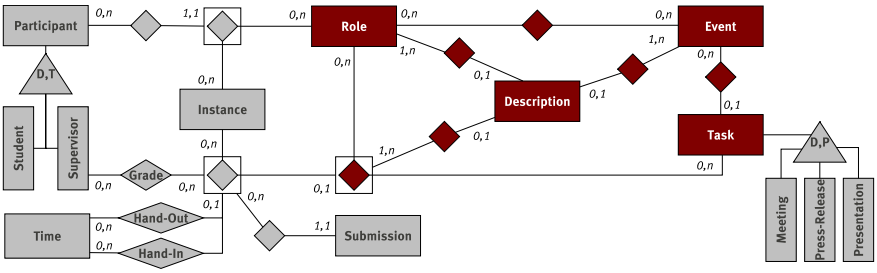
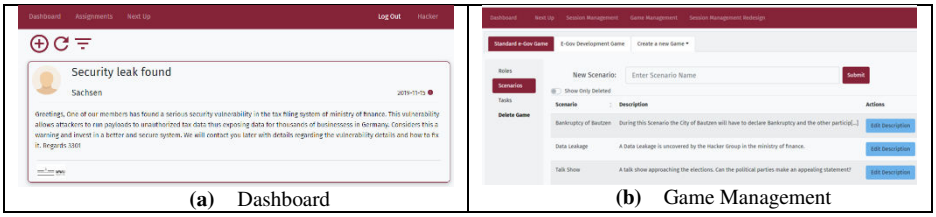


Figure 1. Data Model of the Simulation Game Platform

While this enables us to conceptually represent the eGovernment SG (and also every structurally equivalent one to be developed), it is not an actionable representation (grey parts of Figure 1). One of the primary requirements of the platform to develop is the ability to parallelly host multiple instances of each stored game, e.g., to cater to multiple parallel courses. To address this, we introduced instances as explicit components that can be used to instantiate both roles and RSTs. Events and tasks do not have to be instantiated, as they are merely providing a contextual framework. This, however, does not limit the game supervisors' abilities to exclude certain events via the exclusion of the corresponding set of RSTs. Beyond the instantiation of the games, the platform needs to manage the different participants—including both, players and supervisors. As the platform is currently primarily used within graduate programs, RSTs have been associated with specific timeframes and submission opportunities allowing to assess and grade participation.



(a) Dashboard **(b)** Game Management

Figure 2. Data Model of the Simulation Game Platform

[1] The relationships that are enclosed by a square (entity) represent so-called *reinterpreted relationships*. These combine the characteristics of an entity (being related to other entities) with those of a relationship (relating entities) [23].

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The platform itself has been implemented as a modern, responsive JavaScript single-page app with a solid yet extensible PHP backend. Technology-wise the popular and performant frameworks Vue.js and Laravel have been put to use [21, 22].

Two exemplary screenshots of the current user-dashboard as well as the supervisor management console can be found in Figure 2.

4 Contribution and Future Work

The conceptualized and implemented platform has been put to a first test in the last summer term 2019. It has been used to conduct the simulation game proposed by [6] with a cohort of 25 international Master students currently engaged in a graduate program for Public Sector Innovation and eGovernance. The SG was embedded in the context of a tech-oriented e-gov lecture to combine the classical teaching of theory with a more practice-oriented simulation. This integration further helped us as the supervisors to respond to detected knowledge gaps and also to continuously retrieve feedback from the students. Overall, we received positive feedback from both students and supervisors and saw a lot of active and creative engagement with the simulation game and the platform. We further saw that many of the partaking students are traveling frequently to attend conferences or workshops and benefit from the mobile accessibility of the created platform. One line of improvement that we currently scheduled to be addressed after completing the original web platform is the provision of mobile apps. While the students positively acknowledged being able to partake remotely, further location independence is still on the participants' wish list. As a side effect, "carrying the simulation game with one" might even cause a higher degree of immersion. Other constructive feedback we are currently working on typically aimed at further user experience-related items such as inconsistent naming, click paths, and more design options for student submissions. Smaller issues such as a chronological timeline (*changed to anti-chronological, so latest contributions appear first*) have been fixed directly.

As a final bonus, we want to investigate taking the use of the platform beyond the simple automation of game management. The game proposed by [6] as-is provides a strategy to teach a set of commonly accepted competences—however, so far it cannot detect and respond to a participant group's current state of competences. Since the presented platform will provide us with at least semi-structured data from the participants, we see the potential to connect back to attempts to inductively mine competences from textual data as proposed by [18, 19]. These insights can then be used to identify areas where participants need additional feedback or training, as well as to unveil pathways to create additional simulation games tailored to specific participant profiles.

The further investigation is planned to start in the next summer term. Here another cohort of approx. 25 students will attend the e-gov lecture and will provide the optimal basis to a) further enhance the platform, and b) to test our competence mining approach. From an investigative point of view, this sample is promising, as the stu-

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dents all have different educational and cultural backgrounds implying different levels of competence in the diverse competence areas.

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