

Developing a Gamified Platform to Involve Unemployed Youth in Job-Seeking Activities

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Abstract

Although it is commonly known that young people are active online users, the challenge is, how to attract them to use job-seeking services. Using game design elements in non-game context to create immersive experiences can have a significant impact on the usage of motivation. Our interest was to examine how to find solutions that make the elements of gamification and human skills complement each other in the best possible way. The project's objective was to build a platform using game technologies that bridge isolated young people and work services together for the purpose of helping young people in their job-seeking activities. After extensive research and prototyping, a gamified design for the main application was selected, and serious gaming ideology was chosen as the learning method for a range of training games that the main application would unify together as a platform. We are arguing that gamified job-hunting services have potential to support and activate the unemployed young in job search processes by promoting employment and corresponding to the needs of young adults.

INTRODUCTION

Unemployment is extremely expensive for the societies and public sectors, and it can cause a negative effect on mental health, such as depression and bipolar disorder. (Murphy and Athanasou 1999). The circumstances and experiences of young people in society have changed considerably today compared to the previous generation. These changes affect experiences in the lifestyle, education, labor market, and ability to become an independent member of society. Young people have a multiple choice of pathways to choose from and therefore can cause fear of risk of failure. According to a report on the well-being of young people, more than half of unemployed feel anxious about everyday life

situations and try to avoid meeting new people. In their population-based study, Axelsson and Ejlertsson (2002) argue that social support among young unemployed can avoid becoming socially isolated and slip away from the jobs market. (Axelsson and Ejlertsson 2002)

The growing demand for qualification is expected to cause lack of skilled workers for the market, and it brings up life-long, and self-learning approaches as a central paradigm in education and training, which gives ICT solutions have a vital role in this process. Young unemployed are a potential target group to motivate through a gamified application. There is a total of 241,600 job seekers in Finland, and 52,000 of them are at the age of 25-34 (Tilastokeskus 2018). According to Eurostat (2008) 50% of EU unemployed people aged 20-34 years are ready to change their home place for a job, 21% are prepared to move inside the same country for a job, while 12% would consider moving inside of EU area, and 17% are even ready to step outside the EU region. It raises the question if the gamified applications can be used to promote the job-seeking process for the young unemployed.

Serious gaming has been prominent in computer-assisted learning in recent years in fields such as education, healthcare, engineering and science, and its applications continue to spread steadily to new areas of learning.

To establish the definition for a game, Michael et al. (2006) defines it as "voluntary activity separate from the real world, creating an imaginary world that may or may not have any relation to the real world and that absorbs the player's full attention. Games are played out within a specific time and place, are played according to established rules, and create social groups out of their players".

For serious games, a commonly used definition is by Marsh (2011): "Serious games are digital games, simulations, virtual environments and mixed reality/media that provide opportunities to engage in activities

through responsive narrative/story, gameplay or encounters to inform, influence, for well-being, and/or experience to convey meaning.” Girard et al. (2013) added to the definition that Serious games are virtual games with a useful purpose because otherwise all virtual games could be considered to teach something even though it’s not the actual purpose. Michael et al. (2006) defines serious games as follows: “A serious game is a game in which education (in its various forms) is the primary goal, rather than entertainment.”

The development project depicted in this paper, later designated as HireMe, was designed to bridge isolated young people and the work centrum together to help young people in their job-seeking activities. After extensive research and prototyping, a gamified design for the main application was chosen. Serious gaming design principle was selected as the learning method for a range of training games.

To follow a systematic development of simulation-based serious games and applications, we studied the literature and attempted to find solutions, which suits our case model. Greenblat and Duke (1981) introduced game development framework through four iterative stages of initiation, design, construction, and use. Initiation step indicates game specification, system description, and game components. Design stage focus on the game mechanism, and element design. The construction stage includes development, pilot and usability tests. The final stage is real operation through field testing. (Greenblat and Duke 1981)

Considering those stages as a general development framework, Robinson (2008) states that initiation and design stages should be integrated to iterative sets of conceptual modeling, modeling coding, experimentation, and implementation. He claimed that this approach leads to a proper understanding of real-world problem and solutions. (Robinson 2008)

Van der Zee et al. (2010) defined simulation model used by emphasizing the aspects of game elements on the conceptual modeling activities. They claimed the players and game leaders should be considered as stakeholders, and case examples should be implemented in the design to fulfill the requirements for training and educational purposes. Following various practices of educational training, a serious game solution should not only target soft-skills such as language, negotiation, networking, and leadership; but also more practical skills must be improved. (Van der Zee et al. 2010)

Garris et al. (2002) introduced input-process-output game-based requirements acquisition process model. The input phase is a pre-gaming phase, in which the developers integrate instructional content into the game

content. The process phase is the stage to collect and assess user reaction and behavior and system feedback. The output phase is the stage to evaluate the game achievements, which can be the learning outcome of specific skills in a serious game scenario. (Garris et al. 2002)

OHagan et al. (2014) conducted systematic literature study of software process in game development. The study finding indicates that agile development cycles such as Scrum and Kanban are more relevant to knowledge intensive domain, where the iterative evaluation points are needed through user reactions and system feedback. (OHagan et al. 2014)

Asuncion et al. (2011) followed an iterative agile process with Scrum to develop series of serious games related to a campus tour in the university. Their analysis unveiled that the selected development process would strongly support the involvement of users in the development stages, which supports the main principal of User-Centered Design. (Asuncion et al. 2011)

IMPLEMENTATION

The initial concept was formed as a gamified application which provides training and services in job-seeking process for unemployed youth. It encourages the users to follow self-learning approach and also impose more extensive virtual presence in business and employment-oriented services, and online expert community like LinkedIn and Stack Exchange networks. We believe that the virtual presence in those networks leads to a comprehensive understanding of job market requirements.

Platform

The platform is designed to improve collection of skill-set of the users, in the job hunting process. Those skills are categorized into two groups. Soft skills are set of general practices such as language literacy, negotiation, networking, team-work, and leadership. On the other hand, practical skills are defined by the nature of the job.

We chose to use virtual rewards and levels as game elements in our application based on Zuckerman and Gal-Oz (2014) research on the effectiveness of different game elements. Competition element was as effective as virtual rewards, so we decided to use virtual rewards. The motivation behind the virtual rewards and level-based progression is that companies hiring employees could see the users’ achievements. The better the achievements are, the better chance

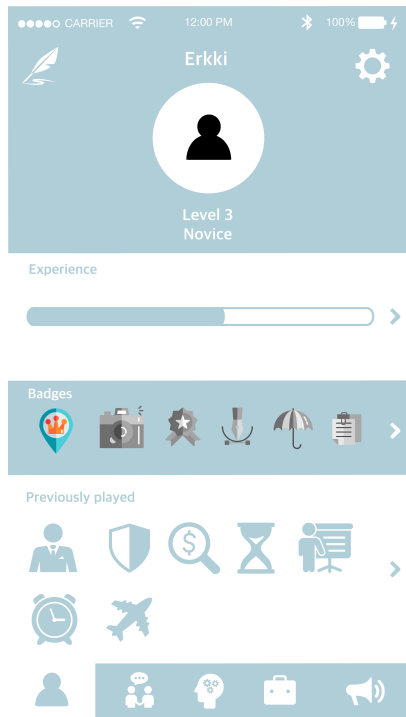


Figure 1: The first prototype was developed as an iOS application.

the user has getting recruited. (Kim and Werbach 2016)

There are many online educational communities for training different practical skills. They usually emerge as a high-quality network of questions and answers on topics in varied fields. Those are places where users can prove their competence in specific fields, such as Stack Exchange, which includes dedicated communities in various fields such as programming, mathematics, different branches of engineering and so on. HireMe application is developed as an integrated platform to fetch users activity points from Stack Exchange networks, through available third-party API.

HireMe platform was developed in three periods. The initial concept was designed at the beginning of fall 2016, and then three development iterations were conducted. In the first iteration, the application was developed in fall 2016 by a student group in the research and development project course, in University of Oulu. Later in summer 2017, the second development iteration was conducted by another student group in the summer school of Kajaani University of Applied Sciences, Finland. Finally, the last development iteration was conducted as part of the research and development project course in fall 2017 in University of Oulu. Three different student groups were involved in those development iterations.

Scrum framework was used during development iter-

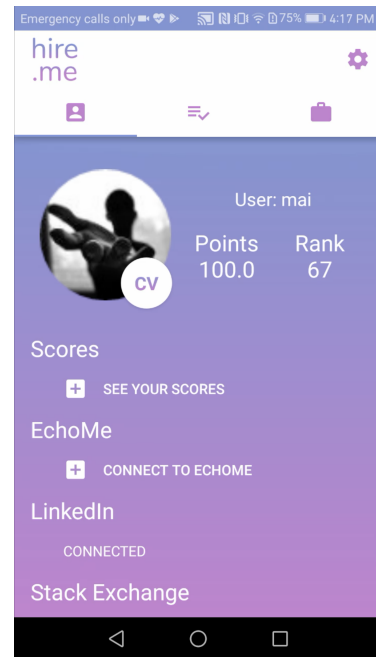


Figure 2: The second prototype was developed as an Android application.

ations. Project members met weekly through scrum sprints to hold intense interaction and discussion. They act as the product owner, scrum master and other stakeholders in different scenarios related to the HireMe platform and mini-games.

The first HireMe prototype was developed for iOS platform using React Native framework. Since it was the first iteration, the purpose was to have an easy-to-use API to enable integration of third-party training games into the application. In the beginning, the back-end was a Node.js server with MongoDB non-relational database, and it was running on Heroku cloud application platform. It was designed to be highly flexible and lightweight enabling various types of trials when testing the HireMe prototype. (Figure 1)

For the second and third prototype, Android platform was chosen for the application, which could be tested by a more extensive variety of users. It was developed by Android Studio to design the front-end, and Docker engine with Vert.x framework and MongoDB to develop the back-end.

Training Games

There are two approaches to integrate educational and training information in HireMe environment. Third-party developer can design games for the platform, or available APIs from other third-party applications can be used to monitor the users' activities in other training networks. Figure 3 shows the current schema of available and implemented mini training games and use of third-party APIs in HireMe platform.

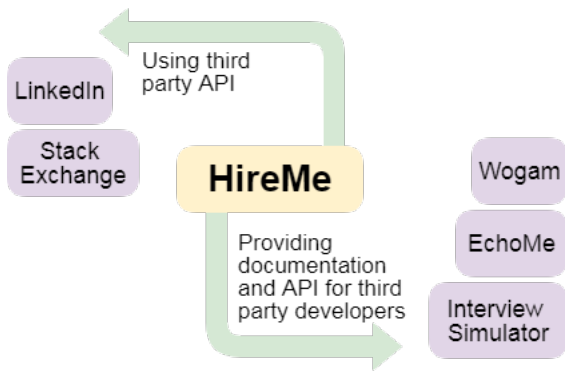


Figure 3: Training games can be developed as native mini-games of HireMe platform, or third-party APIs of available training applications can be used to monitor activities and achievements of users.

Parallel to HireMe development, three mini-games were integrated into the platform. An interview simulator was developed in Unity environment to simulate a job-seeker and recruiter interaction. A word puzzle game (Wogam) was designed to improve the language literacy in French and English languages. Furthermore, EchoMe was developed as a web application to improve presentation skills of the users through peer support processes. (Van der Zee et al. 2010)

Interview simulator

As the first example to demonstrate how HireMe platform connects training games with the main application, we developed a simulation type of interview game with Unity game engine. In the game, the player is sitting in a chair in a first-person view, and the interviewer is asking job interview related questions. Player has four different choices for each question and a limited time to answer. Every choice has a different point value that the player receives. The player also receives feedback after the answers. We reduce errors and improve the player’s independent learning by providing feedback to them. Feedback also creates the feeling of accomplishment and motivates the player (Kwon and Lee 2016). The game aims to prepare the player for real-life job interview. In fact, a job interview cannot be trained easily in real life context. Ypsilanti et al. (2014) stated that the success of learning using serious games lies in the actual involvement of a participant playing the game, which in turn, creates increased cognitive links with real-life situations. (Figure 4)

EchoMe

EchoMe, Figure 5, is an application to improve the user’s presentation skills. It’s developed as an online solution using peer coaching to improve the user’s skills, and engaging them through gamification elements while integrating into the HireMe platform. Its implemen-

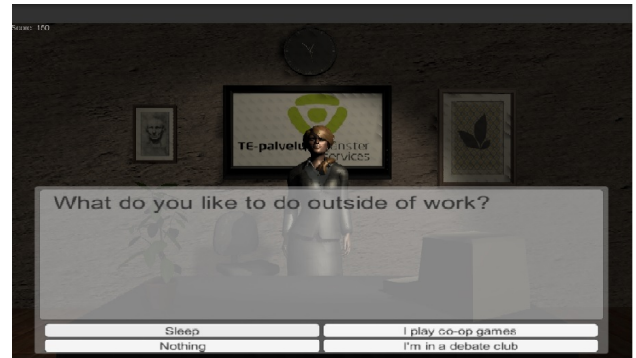


Figure 4: Interview Simulator

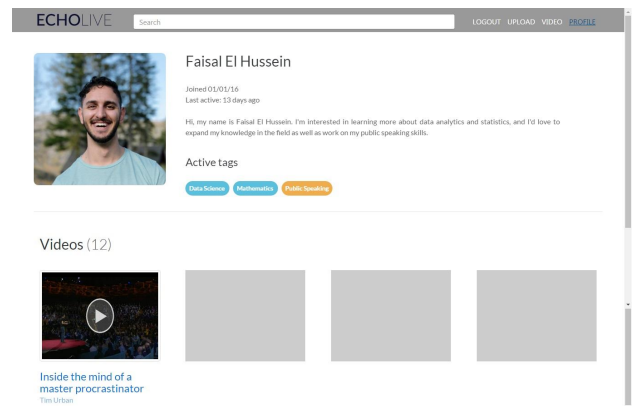


Figure 5: EchoMe is an online solution to improve the presentation skill through peer coaching.

tation provides features to create and categorize video presentations, and a possibility to start a discussion on a video track, which will appear on particular timestamp when playing the video file. EchoMe’s front-end user interface was developed by CSS, HTML, and JavaScript, while AngularJS was used to develop the real-time commenting system. For the database implementation, Laravel and PHP framework were used.

Wogam

Wogam is another mini-game, and it was developed with Unity game engine as a student project. It helps users to improve French and English vocabulary and language literacy. Figure 6 shows that based on displayed card image, users have to create the correct word by placing letter cards in the right order and discover new vocabularies. Spaced repetition system and simple pointing system are implemented to encourage the user to be engaged into this gamified application.

LinkedIn & Stack Exchange integration

HireMe platform is currently integrated with LinkedIn and Stack Exchange network through available REST APIs. LinkedIn API fetches users’ essential information to display it in HireMe profile. That information



Figure 6: Wogam is a puzzle card game to assess users vocabulary knowledge in French and English language and help them to improve it.

includes experiences, publications, languages, skills, certificates, education and recommendation fields. It provides the recruiter with comprehensive background information on the job applicants. Stack Exchange API fetches users' information regarding their activities in different Stack Exchange networks. It includes achievements such as points, privileges, and badges, and most frequent tags associated with the user. In short, HireMe provides an integrated environment for the job seekers and recruiters, where job seekers can reflect their points and achievements from a different expert and educational networks, and the recruiters can monitor practical activities and skills of applicants in a unified format.

EVALUATION

For the acquisition of user requirements and the job-hunting process, we had a brainstorming session on 24th of October 2017 with experts of young people labor administration at TE-office, the Finnish unemployment office. During the session we presented HireMe and EchoMe concepts to the experts, and they provided us with the knowledge of characteristics, value and job search processes of young unemployed that were needed to be considered in further development tasks.

The initial prototypes were evaluated through a heuristic evaluation as well as scenario-based evaluation methods by the development team. Specific sprint sessions were dedicated to the evaluation task.

In the later development iteration, while mini-games and third-party applications were integrated into the platform, we conducted a two-stage evaluation. The participants were recruited in by the help of unemployment office in the city of Oulu. The first phase was in a recruiting event in Oulu, Finland (MegaMatchmaking 2017). It aims to improve the test process and provide proper benchmarks for the measurements in the next phase. The second phase of the evaluation was conducted in the facilities of the University of Oulu.

The first test was planned to be conducted as an observation test by audio and screen recording. Five test subjects participated in the test, and they were asked to fill in the questionnaire after the test. The age of the participants ranged from 24 to 37 with an average age of 31. Users were supposed to create an account in HireMe, add dummy resume and job interest, and then connect the account to mini-games and third-party applications. Participants were asked to use a dummy or real third-party accounts such as LinkedIn or StackOverflow. The test revealed some technical usability flaws in design such as fragment displacement, menu navigation problem, and unhandled errors if the connection was lost. The first test results provided us with a benchmark for the second usability test.

After minor modification in the platform, the second test was conducted with setting similar to the first test, and same tasks were assigned to the subjects. The subjects were supposed to accomplish their task in estimated benchmark time from the first test. Seven test subjects participated in the second test with the age range of 25-37 and an average age of 29. Subjects were asked to answer a questionnaire after the test. Results of the second test revealed few technical usability flaws, such as dealing with unresponsive API of a third-party or lack of feedback from the UI. The questionnaires were designed to collect information about the attitudes of the users, and they indicated positive satisfaction rate towards the HireMe concept, in spite of usability flaws in the technical design.

The main aim to conduct the evaluation phase is to assess the effectiveness, efficiency, and satisfaction of HireMe among target users by assigning predefined tasks. The tasks focused on the functionality of the application, and they start by creating a profile and then connecting to third-party services and mini-games, and finally, all achievement and points should be presented in HireMe profile in a united format.

CONCLUSION

It is known that unemployment is expensive for societies and tackling it is essential but also very challenging. Gamification works best when it motivates people to do things independently adding a good user experience and value to the user.

As part of the future plan, we aim to implement API document to specify necessary detailed information to develop third-party mini-games, which can be integrated to the platform.

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