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BROWSER GAME AS A NEW WAY OF CAREER GUIDANCE

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Abstract

The article discusses the problem of developing new ways of career guidance for applicants. In the conditions of tough competition in the market of educational services, attracting motivated, capable of learning and interested applicants is one of the main tasks of the functioning of a higher educational institution. Traditional activities, which are currently being implemented by higher educational institutions, are losing their effectiveness in the framework of career guidance. In this regard, it is extremely important to develop new forms of work with applicants. As a result of the work, a web application for the career guidance was designed in the form of a computer game. To form a career guidance recommendation, the game theory approach was used. The strategy of the career guidance game is described, its functional model based on the use case diagram is presented. A method for determining recommendations based on the Hurwitz criterion is proposed.

Keywords: Career guidance, browser game, Hurwitz criterion

1. Introduction

Career guidance (vocational guidance) defined by Fursov (2015) as a multi-aspect and continuous process of interaction between the subjects of social and labor relations initiated and managed by society, aimed at the conscious professional self-determination of the individual, mastering the profession and the implementation of professional self-improvement, ensuring a balance between the needs of the economy in personnel and the individual's own abilities and preferences. The practical side of career guidance includes the activities of state and public organizations, enterprises, institutions, schools, as well as families to improve the process of professional and social self-determination in the interests of the individual and society as a whole.

The objectives of career guidance mentioned by Dorozhkin and Zeer (2014) are:

- Formation of professional competence: acquaintance with the world of professions, classification and socio-psychological characteristics of professions, typical scenarios of professional biography.

- Development of professional competencies: communication and presentation skills, employment and self-marketing skills, abilities in the field of designing one's career growth.

- Providing psychologically competent support of a person's professional life from the beginning of professional differentiation of interests and inclinations to the completion of a professional biography.

2. Problem Statement

Universities, technical schools, schools and other organizations that carry out work to determine the professional predisposition of students face many problems. These are, for instance, the lack of generally accepted images of life and professional success, the weak interaction of career guidance science with representatives of related sciences and areas of knowledge, lack of time for career guidance work, the changeable interest of students in professions and work. In addition, many ways of conducting career guidance work become obsolete, which leads to a loss of attention, motivation and interest on the part of students.

At the moment, potential applicants are widely using the Internet and social networks to obtain information. According to the results of a survey of 120 first-year students, it turned out that 100% of them used information about higher education institutions presented on the Internet to one degree or another when they entered. For this reason, in order to increase the activity of applicants, it is necessary to develop and introduce new computer forms of career guidance activities.

In the literature, there are several studies concerning computer-based forms of career guidance. Bhanu et al. (2019) propose to measure the psychological characteristics of a graduate through the tic-tac-toe game. Based on the game options and game results, the authors design the cognitive model capturing psychological factors that include intelligence, learning ability, regularity, speed of play, patience and perseverance of the student.

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Authors Shi and Shih (2012) assess the feasibility of a career game, and propose possible approaches for making game-based career guidance system. Dunwell et al. (2013) report on an approach to career guidance incorporating game-based elements such as character development and decision-making alongside a visual and user-centric approach to fostering engagement. The game contains targeted evaluation questionnaires and embedded career videos.

Zaslavskaya and Zaslavskiy (2020) develop a training system for the design of computer games for early vocational training. Gaming approach is used in the study of Martin-Kowal et al. (2021) for assessment of military recruits for cyber careers. Shepiliev et al. (2021) propose a prototype of a career guidance quest system that involve solving intellectual and search problems in a game format using WebAR technology.

3. Research Questions

In our study, we ask ourselves the following questions:

- How to increase the attractiveness of career guidance for schoolchildren?

- What new ways of career guidance could be?

- How to combine a computer gaming approach with career guidance?

- How to calculate career recommendations based on the results of the game?

4. Purpose of the Study

The aim of our study is increasing the effectiveness of career guidance of applicants by developing a new method for determining professional suitability: a browser-based career guidance game.

5. Research Methods

For game design we used use case diagrams. Use case diagrams are the initial conceptual representations in the system design and development process. Such diagrams consist of actors, use cases, and relationships between them. The essence of this diagram is as follows: the system being designed is represented as a set of participants interacting with the system using the so-called use case. An actor is any object, subject, or system that interacts with the modeled system from the outside. In turn, a use case is a specification of services (functions) that the system provides to participants. In other words, each use case defines a specific set of actions that the system performs when interacting with an actor. However, the model does not reflect how this set of actions is implemented.

A use case is indicated in the diagram by an ellipse containing a description of an operation or action. A user-initiated use case is a complete sequence of actions. This means that after the actor's request has finished processing, the system must return to a state ready to execute the next request. Relationships between actors and use cases are displayed using several types of relationships, in which are:

- associations are used to indicate the interaction of participants with a use case;

- generalizations are used to indicate that a certain entity A can be generalized to entity B;

- inclusions indicate that some behaviors of one use case should be included in the sequence of another as components;

- extensions define the ability to include the behavior of one use case in another.

For game implementation we used Construct 2 which is 2D game constructor. Games made on it can be accessed on PC, Mac, Linux, HTML5-enabled browsers, Android, iOS, Windows Phone, Blackberry 10. The program interface has a visual editor, where there are "events" and "actions" that create the logic of games. In addition, the constructor is equipped with an event visualization system based on particle effects, as well as the ability to customize the behavior of objects.

6. Findings

Our proposed strategy is to implement career guidance activities in the form of a computer game. This method involves the use of modern technologies, accessibility, time independence and fascination. Entertaining motivates students to play actions, and the more actions the player performs, the more statistics accumulate by the end of the game, and the more reasonable the recommendations become. The plot of the game, in this case, becomes a tool for cognition of the individual and a way to expand career guidance. Thus, the plot of the game forces the player to make a sequence of decisions that characterizes his predispositions.

The game includes, in addition to the character-player, subjects and objects of the plot, subjects and objects of quests, as well as neutral characters. At the heart of the developed game of the "farm" type are areas where you can grow resources - trees. This resource is further used for woodworking, for creation of other resources (for example, chemical - bioethanol) and for creation of new items (crafting). The game process can be represented in the general case as follows: at the beginning of the game, the player receives a certain amount of resources. According to the story, the player is required to create new items using various resources. To obtain resources, the player must visit various locations that have themes of different institutes of the Reshetnev Siberian State University of Science and Technology. As the story progresses, the player opens up new locations, new items, resources and quests become available. A brief diagram of the use cases for the "Home" location is shown in Figure 1. Screenshot of location "Market" is shown in Figure 2.
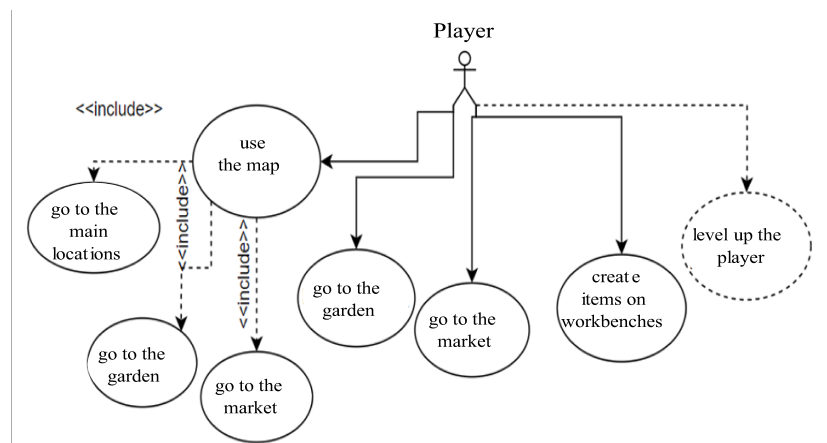
Figure 1. Use case diagram "Home"

Figure 2. Location "Market"

The totality of resources accumulated by the end of the game, the results of completing quests, the time of visiting certain locations determines the recommendation for admission to a certain institute. For making the recommendation, we used game theory approach. Hurwitz criterion is based on two assumptions: "nature" can be in the most favorable state with probability *y* and in the most unfavorable state with probability (1-*y*), where y is the confidence factor. The Hurwitz criterion is a criterion of pessimism-optimism and is written as follows:

$$W = max[y*min[h_{ij}] + (1-y)*max[h_{ij}]],$$

where h_{ij} is profit, utility or income, in our case this is the score of each institution.

The criterion strikes a balance between extreme pessimism and extreme optimism by weighting both behavior strategies with the appropriate weights *y* and *(1-y)*, where $0 \leq y \leq 1$. At the beginning of the game, *y* = 0.5, since all institutions initially have an equal probability choice. As the game progresses, the value of *y* for preferred institutions will increase, while for the rest it will decrease. The optimal strategy is the one for which the Hurwitz criterion *W* will be maximum at the end of the game.

7. Conclusions

One of the most preferred forms of career guidance is gaming. A career guidance in the form of a game minimizes the influence of the tester, allows the student to "open up". An active form of career guidance stirs up interest in the process. However, the disadvantages of this form are a rather large consumption of time resources, the need to manually fix the game protocol, and the impossibility of independent work without the participation of the tester. One can get rid of these shortcomings by creating the career guidance game in the form of a computer game.

In this study, based on design decisions, a browser-based career guidance game in the platformer genre was developed and constructed. The game implements recommendations for seven institutions and their respective objects and locations. To form a career guidance recommendation, the game theory approach was used.

Acknowledgments

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