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Analysis and application of gamification

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ABSTRACT

In this paper we present a method of analysis and application of gamification as a tool to assist the participation and motivation of people in carrying out various tasks and activities. We analyze what are the psychological and social motivations of human beings and how game mechanics can help when it comes to satisfy these needs. Likewise, it is proposed a method for analyzing the effectiveness of gamification based on a quality service model and the metrics associated with the properties of the playability as a measure of fun induced by the process of gamification.

Categories and Subject Descriptors

H.1.2 [Information Systems]: User/Machine Systems – *Human factors*.

General Terms

Design, Experimentation, Human Factors.

Keywords

Gamificación, metodología, motivación, mecánicas, análisis, efectividad.

1. INTRODUCTION

Gamificación, defined as the use of game design elements in non-game contexts [4], can be used as a tool to improve the participation and motivation of people in carrying out diverse tasks and activities that, basically, could not be too attractive. Its application is not restricted to any specific area and can be used in contexts as diverse as education [8], the development of respectful behaviour towards the natural environment [7, 1] or improve the well-being of the elderly [5].

2. VIDEOGAMES AND MOTIVATION THEORIES

A videogame is a computer program specifically created to entertain, based on the interaction between a person and a machine where the videogame is executed [6]. Fun and highly interaction are some of the most interesting features of these

systems. Thanks to these characteristics, videogames can be used as a motivational tool of human behavior [9, 11]. The self-determination theory, proposed by Ryan and Deci, is a macro theory of human motivation concerning people's inherent growth tendencies and their innate psychological needs [12]. According to this theory, intrinsic motivation is the core that is associated with sports and gambling [12]. Intrinsically motivated activities are those that the individual finds interesting and performs without any kind of conditioning, just by the mere pleasure of carrying them out. To maintain the intrinsic motivation in individuals, it is necessary to satisfy the following psychological and social needs:

Autonomy: Autonomy refers to the sense of will when performing a task. When activities are performed by personal interest, perceived autonomy is high. Providing opportunities to choose, using positive feedback and not controlling the instructions given to people, have been shown to improve the autonomy and consequently, the intrinsic motivation of individuals [13].

Competence: Competence is the need of the people to participate in challenges and feel competent and efficient. Factors that improve the experience of competition, as the opportunities for acquiring new knowledge or skills, be optimally challenged [2] or receive positive feedback, improve the perceived level of competition and therefore it also improves intrinsic motivation.

Relation: Relation is experienced when a person feels connected to others. Intrinsic motivation will be strengthened in relations that convey security, making this type of motivation appears more frequently and in a more robust way [12, 3]. The current integration between games and social networks is very interesting to use it as a reinforcing motivation.

In one of his books [10], Daniel H. Pink identifies three key elements that allow achieving personal well-being and personal satisfaction: autonomy, mastery and purpose. Autonomy responds to the desire of all people to control their own lives and how they do their jobs. Mastery concerns the desire to constantly improve and achieving personal satisfaction through challenges that fit the capabilities of each individual. The purpose acts as a connecting thread of the intrinsic needs of people and enables personal fulfillment.

3. DESCRIPTION OF THE METHOD

In general, our method can be defined by an iterative sequence of activities that can be repeated for each of the goals or tasks that define the specific business model where you want to perform the process of gamification.

To make an effective process of gamification, we propose the following activities:

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1. **Identification of the main objective:** Identify the main purpose of the task you want to gamify. Normally, any task or job you wish to carry out consists of a main objective that can be clearly identified.
2. **Identificación of the transversal objective:** Identify one or more underlying objectives that are interesting to people. This objective should capture the interest of the person and based on it we will create a system based on game mechanics that improves the motivation and interest of the individual.
3. **Selection of game mechanics support:** Selection of game mechanics that match the objectives and support the needs of human motivation (autonomy, competence and relation). Some examples of these mechanics are

Autonomy: profiles, avatars, macros, configurable interface, alternative activities, privacy control, notification control.

Competence: positive feedback, optimal challenge, progressive information, intuitive controls, points, levels, leaderboards.

Relation: groups, messages, blogs, connection to social networks, chat.
4. **Effectiveness analysis:** Analysis of the effectiveness of the implementation of gamificación based on fun, quality indicators and satisfaction, and service quality. The analysis of fun will be based on the analysis of metrics associated with the playability, defined by J. L. González [6], and it will be done through test of users by means of the completion of questionnaires and tests of users with specific metrics or performing a heuristic evaluation by experts, all on the gamified processes and the applied game mechanics. To analyze the effectiveness, we use a service quality model and we analyze the quality parameters that previously have been fixed, making a comparison between the values obtained prior to gamification process and the results that have been achieved once the gamification have been applied. A service quality model that can be particularly interesting to analyze the gamification, is that proposed by Professor Richard L. Oliver of Vanderbilt University, later modified by Richard A. Spreng and Robert D. Mackoy [14]. This model seeks to integrate customer satisfaction and quality of service, defining the entities that affect their value.

4. CONCLUSIONS AND FUTURE WORK

In this article we have proposed a method that facilitates the analysis and application of gamification. Based on the self-determination theory, we define a framework that allows us, on the one hand, to determine what type of game mechanics should incorporate these activities to meet the psychological and social needs of human motivation, and by another, to assess the effectiveness of gamificación process based on the fun, using the properties that characterize the playability, and its degree of improvement in obtaining satisfactory results through a model of quality of services.

We are currently working on the development of methods of heuristic evaluation for the analysis of the effectiveness of the gamification, we are adapting the gameplay analysis metrics to the gamification and we are testing the application of the method in real cases.

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