

# Investigating Balance Process in Entrepreneur Gamified Scenarios

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**Abstract.** *To non-experts, balancing consciousness is even harder concerning their perception of how their decisions possibly affect employees. In this work, we interviewed three managers to understand their knowledge of balancing and their level of perception of the theme. Our results indicate they know it can affect user satisfaction, but they do not know precisely how. Also, visualization of a balanced progression system is an issue. Therefore, we generated a gamification process model that facilitates communication among project managers. Future work will implement this model and conduct an evaluation study of user satisfaction and perceived balancing based on this gamification balancing approach..*

**Keywords—** *gamification model, gamification mechanics, balance, balancing*

## 1. Introduction

Gamification [Deterding et al., 2011, Kapp, 2013] has mainly been used in enterprise scenarios over the last years and has been demonstrated to effectively motivate and engage employees [Herzig et al., 2015, Kumar and Herger, 2013, Robson et al., 2016] with attaining various goals over a wide range of themes and platforms. However, users themselves are not always able to identify problems they are facing, and may simply provide generalized comments and feedback.

The difficulty is one of the common balancing issues, that include changing quantifiable values and relations between them, directly or indirectly. Game balancing, in general, is complex, and the balancing process itself requires an understanding of what it supports, such as user expectations, satisfaction, fun, engagement and flow. However, there has been little discussion on game balancing background within gamified systems and consequences [Hamari and Koivisto, 2014, AlMarshedi et al., 2015]. In this study we aim to investigate how to support non-experts for a gamification balance visualization proposal.

We used a scenario from a previous business gamification model [Tizuka et al., 2021] and conducted a focus group interview with the decision-makers involved in the gamification process. As result, we perceived one of the difficulties reported by the project managers was regarding long term balancing visualization. So we used the Machinations Framework [Adams and Dormans, 2012] to execute some tests to facilitate this demand and presented them back to them. Thereafter, we established a process model based on Business Process Model and Notation (BPMN) to deliver a way that future investigations on user satisfaction can be taken through the variables mentioned.

## **2. Related Works**

### **2.1. Game balancing and the perception of its influence on player satisfaction**

Gamified services have appeared on the market as models with promising techniques adapted to the organizational context. As well as it is known that it is impossible to guarantee that everyone will have the same involvement and dedication, fairness inside games and a well-balanced gamified solution can be a supporting mechanic to help demonstrate to non-experts what this balancing means. Balance can be understood in terms of flow, relatedness, and purpose, which involves player progression, fairness economy, and interest motivation goals. Becker and Görlich (2020) point out there is no consensus on what “game balancing” actually means, being players’ perception and experience usually its’ objective. The perceived difficulty of a task - the problem that the player senses and the type we are most concerned with- consists of the relative difficulty minus the player’s experience at meeting such challenges [Adams, 2014]. But even with the lack of consensus on game balancing, there are some common issues such as (the State or Game) Flow [Csikszentmihalyi, 2000]. This flow represents the mechanics that make up a game’s model and dramatically impacts the emergent gameplay of most simulation games, which also occurs in the design of gamified systems and is still little explored.

### **2.2. Models and Tools to visually present balancing**

Although many gamification design frameworks exist [Mora et al., 2015, Morschheuser et al., 2017, Tondello et al., 2016], they tend to be at a high level of abstraction. There are some game design tools available, such as Machinations Framework [Dormans, 2011], Stateflow and Simulink from Mathworks. None of them has been used to provide support to non-experts in gamification design models and what influences balancing can cause. Morschheuser and others (2015) proposes an extension for Business Process Model and Notation (BPMN<sup>1</sup>) and gamification process patterns, which were derived from various gamification use cases. Beyer and others (2016) also applied BPMN for the balancing process. They conclude that in this way, it can be used to formulate experience into explicit knowledge about a game. However, the application to a real scenario had not yet been applied.

## **3. Research and method**

In this study, we consider decision makers as non-experts in the games area but responsible for delegating tasks to players within the previous gamification business model proposed in [Tizuka et al., 2021], involving different responsibilities from the organization team. For instance, agents (“leaders”) create tasks (“missions”) and delegate them to other agents (“players”). When players conclude missions, they receive feedback (“notifications”) and rewards (“points” or “coins”).

We focused on the points type of reward through four research questions (RQs). Table 1 resumes the RQs, the questions we ask the decision-makers, and the information we want to collect related to the parameters. In order to answer these RQs, we conducted an online focus group interview [Lederman, 1995] with three quality

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<sup>1</sup> For more information: <https://www.bpmn.org/>

managers. Firstly, the participants were introduced to the overall experiment, through the sharing of screens related to the player user progression system, as the person manages to achieve the goals and objectives proposed by the gamification. We also collected their (informed) consent on recording. To define the data interpretation and to validate balancing process strategies taken, we followed Krueger’s seven established criteria [Krueger, 1994].

To develop an easy conceptual visual test of our model, we used the Machinations framework [Dormans, 2011] within the template “Tutorial Basic RPG experience progression system” [Morschheuser, 2015]. Finally, we defined the parameters and variables inherent to gamification and generated our process model based on BPMN.

**Table 1. Research questions, questions we asked and the parameters related to balancing**

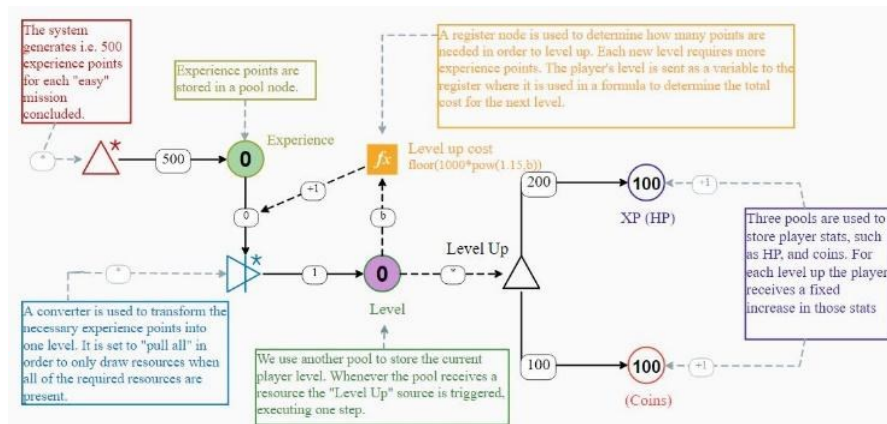
Research Question (RQ)	Questions made to the quality managers	Parameter related to balancing
RQ1: Who is responsible for balancing gamification?	Q1: What are your expectations for gamification? Q2: Do you think gamification is a fair process that can impact user satisfaction on accomplishing routine tasks?	We wanted to understand how far could managers understand their role in the gamification process itself and whether this could be achieved through balancing
RQ2: Do managers understand essential balancing concepts in terms of a gamified process?	Q3: Do you know what game balancing is? Q4: For you, which task is more difficult or requires more knowledge, time, or any other factor to be accomplished?	(a) time of a gamified session (when does a session start or end?), (b) period of a campaign/season (composed by a number of sessions, even that a cycle ends and begins to another), (c) player progression rate, and (d) types of difficulty from each task
RQ3: Are managers aware of the impacts and effects balancing can influence to player’s satisfaction?	Q5: How much do you think the task difficulty impacts player performance? Q6: Does this have to do with the rewards he will be able to achieve or even with a question of a culture of appreciation for quality matters?	
RQ4: What are the challenges in terms of visualizing balancing?	Q7: What is the best form of representation that you think would be interesting to have in order to understand, monitor and evaluate user level progression?	How to ensure that it is not “forgotten” or even monitor and follow the player’s progress?

#### 4. Results

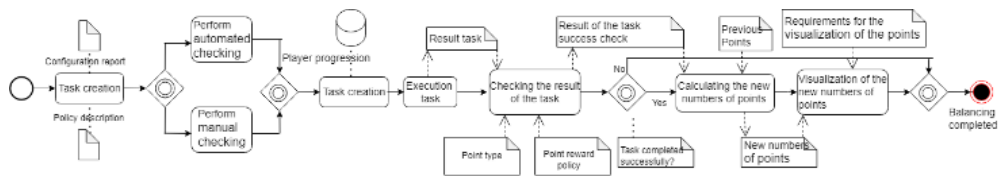
The duration of this activity was about one hour and a half. All participants agreed to have a video recording. From Q1, the main response was that gamification would improve employee engagement in quality knowledge. Answers from Q2 showed that leaders are aware of how balancing can influence and affect user satisfaction. However,

they do not know how to measure or evaluate user performance through gamification or to model a progression system. For instance, one participant pointed out when answering Q3: “This is when you say something is too hard or too easy to accomplish, right?”. We discussed rules (Q4, Q5), and all agreed not to implement any decreasing punishment. Also, to establish a limit to players’ progression up to Level 10 three or four months after a “gamified season”, involving a level of progression that was steady but lasting. Answers for Q6 suggested that participants were sure that rewards could improve employee’s performance. When we talk about metrics related to gamification and player performance or their degree of satisfaction (Q7), they are not sure what the relationship is between the activities carried out and players' behavior within the system. Based on all the answers, we defined the parameters, and we developed our gamification progression model (see Fig. 1). Considering three possible difficulty levels, players would need to complete 43 missions classified as "easy," 32 "normal missions," or 25 "hard missions."

We presented this framework again to the quality managers. They were extremely satisfied with the tool shown, as it was unprecedented. The simulations were presented in real-time through video screen share with the Machinations platform, giving space and time to open discussion. Specific comments such as: “this is so easier to understand balance”, “I have never thought of balancing in this way before” were taken into account, considering a satisfactory and 100% good perception of the supporting tool adopted. Evaluating the intensity of the comments with words such as “good”, “great”, “this is so interesting”, we identified that the stakeholders were surprised with the balancing process projection for an extended period. We observed that the framework also helped to demonstrate a better understanding of gamification balance concepts, processes, and potential impacts or effects it can lead, especially dealing with fairness and economy inside the system. Finally, we designed the gamification model process (Fig.2) to facilitate communication among managers. Our model is integrated with a part being automatic (by the actual system adapted to gamification model design), since managers’ perception of how many points and when it affects is low and they would not know how to balance, and manually entered part, as managers (“leaders”) are responsible for creating and delegating tasks (“missions”) to employee (“players”). As a result, we present a balanced basis model, so new further content additions become much easier to develop without losing the bigger picture and maintaining a positive learning experience for the employee and quality management.



**Figure 1. Our final balanced basis with the Machinations framework and possible adaptation points if needed.**



**Figure 2. Gamification model process based on BPMN approach.**

## 5. Discussions

Although many gamification design frameworks exist, they involve a high level of abstraction and are not practical enough to facilitate the integrated design of more concrete game mechanics as a balanced process within the company's internal system. For instance, a player progression is a simple mechanic. However, the perception of difficulty varies greatly from person to person and depends on user's abilities, expectations and knowledge about the topic.

Therefore, our study was positive in elucidating project managers' knowledge about balancing, how it works, and expectations and providing defining goals for the balancing process. Faced with perceptions that may vary from person to person, our study showed that using BPMN notation facilitates communication with non-experts in this case, as it is a language used in most business scenarios. However, this research is still working on the challenge of presenting this visualization in real-time or even enough. So, it is possible to monitor and analyze the player, in a way that indicates the specific points the balance may be out of adjustment or deserve adaptations

## 6. Conclusions and Future Research

Achieving well-balanced gamification goals depends, among other intrinsic factors, on individual skills, which cannot be measured objectively only by numbers and statistics. However, we consider this discussion of balancing a fundamental concept of gamification design practice of adjusting the rules of a game, usually to prevent any of its component systems from being ineffective or undesirable compared to their peers. An unbalanced system represents, at the very least, wasted development resources and, at worst, can undermine the entire ruleset of the game, making it impossible to perform essential roles or tasks. Future work will implement this model in this partner company application to record and analyze data. Also, to collect perception from the player's point of view, concerning difficulty levels and balancing.

## 7. Acknowledgment

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