The Business Process Game

Nico Herzberg[1] and Matthias Kunze[2]

[1] SAP Germany,
`nico.herzberg@sap.com`
[2] Hasso Plattner Institute (University of Potsdam),
`matthias.kunze@hpi.de`

Abstract Recently, gamification – the augmentation of work with game elements – attracted tremendous interest and has become one of the most important trends in digital business strategy[1].
In this paper, the authors elaborate on the opportunities to gamify operative business process management, in particular process enactment, and show various ways to engage process participants in their daily work, support them achieving their goals, and develop their skills. A concrete implementation of gamification in business process management is shown on a use case and a detailed discussion of future research is given.

1 Gamification in Business Process Management

Gamification is the discipline utilizing game elements, such as points, badges, and leaderboards, and experience design, e.g., game play, play space, and story line, to engage and motivate people to achieve their goals [1,2]. It targets at customers, communities of interest, and employees – in particular knowledge workers – as players and focuses their goals through player centered design [5]. To create value with a gamified solution the sponsoring organization needs to align supported player's goals with their own goals.

In this paper, we concentrate on the fact that gamification strives to engage knowledge workers to reach their goals by incorporating game elements into the context of their tasks and responsibilities within an organization's business processes. Motivation is seen as a means to support the worker in changing behaviors, in acquiring new skills, and building on existing expertise and performance.

With regards to business process management (BPM), we focus on the process participant, who carries out parts of business processes. Besides the execution of tasks in the context of the process, this includes to understand the underlying process model, its technical and organizational environment, i.e., resources and interaction partners, as well as documenting the results of the operations carried out. In contrast, other research approaches, for example, described by Santorum et al. [6,7] resort to social aspects, motivation, and gamification of process formalization and analysis, process modeling, and simulation.

Hence, by introducing game elements to operational aspects of BPM – becoming skilled in new processes, enacting them, and their improvement – we aim at

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[1] `http://www.gartner.com/newsroom/id/2702117`

the process participant as our main game character or player. For this purpose, we introduce the following game elements.

Process scores Participants can receive scores for each business process they are involved in. The sum of scores for one process represents the participant's progress in mastering the process.

Badges, leaderboards Upon exceeding a score thresholds, participants are awarded with badges to publicly show their progress. Often, new features and responsibilities are associated with earned badges.

Points For each earned process score, the participant receives a point in their personal account. In contrast to process scores, these points can be traded for certain features or benefits.

Challenges Challenges are particular efforts that need to be carried out to gain additional scores.

Challenges, in particular, offer an opportunity to foster the collaboration between different process participants. In general, collaboration requires to hand-over work to other participants, which often results in delays in a business process as the receiving person needs to familiarize themselves with the incoming work. Hence, by challenging collaboration, we envision participants to work together more closely, e.g., in concise personal meetings.

2   Stages and Badges in Mastering a Business Process

As mentioned above, we aim at supporting process participants in mastering business processes. Therefore, we have identified three principal stages that describe, how familiar a participant is with a business process. Badges are associated with each stage, as stated in Figure 1. Here, we provide only the main badges that need to be earned to enter the next stage. To implement the approach, more badges should be awarded while traversing each stage, respectively.

Figure 1. Stages and badges of mastering a business process

Onboarding. At the beginning of the onboarding phase, the participant has no experience at all in carrying out the business process. This can be the case if the participant has been assigned new responsibilities or the process has been newly introduced or recently re-engineered. This phase is closely related with the first achievement, the *apprentice* badge, which is earned by familiarizing oneself with the business process. Process scores are earned by collecting information, and thus acquiring knowledge, about the process.

On the one hand, passing this stage can be achieved by setting up artificial cases in the fashion of a role-playing game: Apprentices are faced with a simulation of historic cases of the business process and need to carry them out. They need to take the right choices, access the right information, interact with adequate resources, and meet predetermined deadlines. On the other hand or subsequent to the role-play, the apprentice tackles real cases under the supervision of more experienced participants who mastered the same process such that they earned the *champion* badge.

Enactment. Once apprentices have gathered sufficient experience in the process, i.e., their process score surmounts a certain threshold, they are awarded with the process *master* badge and are ready to perform the business process without the supervision of a mentor. Nevertheless, mentors remain available for assistance, thus fostering collaboration between colleagues.

The enactment stage is the main stage and will be discussed further in Section 3. Process scores are earned by individual or collaborative performance and improvement. That is, getting better at carrying out operations, e.g., increasing the quality of results and the timeliness of documentation, and getting faster, e.g., reduce waiting and execution times or executing more cases. Key performance indicators can be used to align operational goals of business processes with the performance of process participants. However, such measurements must be designed carefully and transparently as not to counter collaboration or other quality or performance goals.

Improvement and Mentoring. Burke [1] states that gamification works best with intrinsic motivation, i.e., the emotional urge to personal development. One of these intrinsic factors is personal assistance, i.e., if persons are able to help, they receive implicit and explicit praise. Another intrinsic driver is the establishment of a positive impact on one's environment, e.g., a business process. Both require a high skill in process mastery, and therefore such process participants are awarded with the *champion* badge.

So far, we envision two ways to leverage intrinsic motivation. First, a very experienced process participant can become a mentor, who advices *apprentices* in the onboarding stage. Second, process participants can contribute to the improvement of business processes, both actively and passively. Actively, they can propose changes to the business process to improve its outcome or performance. Passive contribution can be carried out by "betting" points on a proposed change. If the change is applied successfully, passive contributors earn the amount of their stake and the proposer earns an amount that relates to the sum of stakes put into the proposal. If a business process is re-engineered, existing champions may be downgraded as they need to first familiarize themselves with the new process. However, the proposer and supporters of a change, who certainly understood it well, remain in the position of a process champion.

When applying gamification to BPM, one needs to bear in mind that the execution of a business process is, in general, a collaborative effort. That means that different people with different roles are involved as well as interaction partners, e.g., from

other departments or organizations. However, as gamification aims at motivating individuals, any means to employ it in business processes requires well defined and transparent measures for the individual performance of process participants. We elaborate on this in the next section.

3   Gamified BPM in Action

In the following, we present a gamified BPM solution with the example of a process for specifying a job that we designed with a German health insurance provider, see Figure 2. The process is mainly driven by the *organization development* (expanded pool) but needs input from other departments of the company with which it interacts. The principles of gamification can be applied to onboard new process participants, to execute the process efficiently, and to set a scene for process improvement, as elaborated on in Section 2. In this section, we focus on the efficient execution of the process.
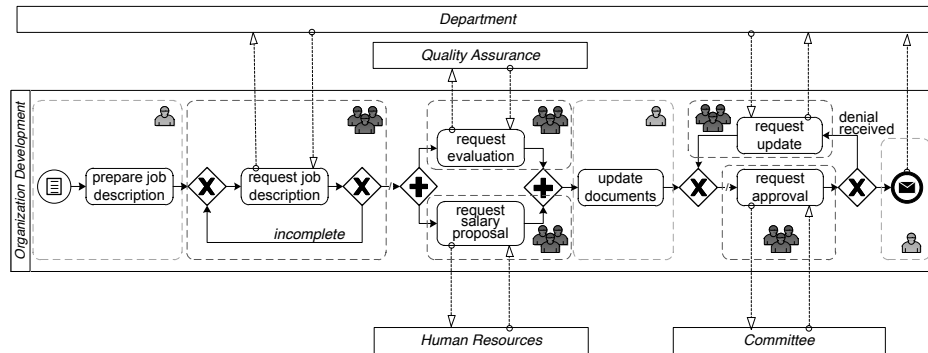

Figure 2. Business process model for specifying job descriptions at a German health insurance provider, including individual and collaborative tasks to earn process scores.

Once a new job specification is required, the *job description is prepared* for further interaction with the other departments. This is an individual task by an employee of the organization development department and thus, gamification targets on that individual (shown as a dashed line area with one individual) for these steps. In contrast, the following steps involve collaboration between the organization development employee and the department for which the job description is created (shown as a dashed line area with a group). In an iterative fashion between the two participants, the job description is to be completed successfully. Motivation of only one individual would lead to a decrease in quality, e.g., the organization development employee could quickly accept the job description without proper proofing for a quick completion and claim the lack of quality is due to the interaction partner. Therefore, and to sport the successful

collaboration in the context of the business process, a gamification solution for several parties is required.

The completed job description must be evaluated by the quality assurance. Again, this is a collaborative effort as the employees of the quality assurance department and of the organization department should be stimulated to produce a joint result quickly. In parallel, the salary proposal from the human resources office is incorporated (collaborative). After these two steps, the documents are updated (individual) before approval is requested from the committee (collaborative). If the job description is approved, it can be sent to the department to be implemented (individual), otherwise it needs to be updated again (collaborative).

The activities *preparing the job description*, *updating the document*, and *sending out the approved job description* are an individual process participant's responsibility for earning process scores for the particular process to reach the next badge. In contrast, working on the other activities in the process depends on the work of other departments' employees as well. Thus, process scoring involves the performance of other people.

The concrete playground for the shown process is designed with the following levels that are rewarded with a badge when successfully completed, cf. Figure 2.

Introduction Learning about the process theoretically by studying all process documentation and understanding the process model. To become an *apprentice*, this level is completed by successfully passing a challenge, i.e., a test that asks questions about the process.

Advised process execution The process *apprentice* is responsible for executing the particular process, but is supported by a *champion* in the role of a mentor. Both of them can score by efficient process execution. The *apprentice* needs 100 process scores to become a *master*.

Personally improve execution performance The process *master* is responsible for executing the particular process and can score with an efficient process execution including individual and collaborative efforts. The *master* needs 1000 process scores to become a *champion*.

Process execution, improvement, and mentoring The process *champion* is responsible for efficient process execution, process improvement based on process model level, and mentoring process *apprentices*. *Champions* score in all three areas and get additional points when improving the process. To become a *guru*, *champions* need to score 1000 points year by year.

Process Development Being a *guru* enables an employee to access a pool of specific tasks of the business process management office, e.g., the design of completely new business processes or the consolidation of business process duplicates and variants that are the result of merged departments or companies. These specific tasks allow employees to reach the next level of their personal promotion.

Scoring while executing the business process is possible by performing the single activities efficiently and meeting KPIs, which are set as follows:

– Preparing the job description once it is requested within two days will result in 2 scores, within three days in 1 score, and in more than three days in 0 scores.
– Complete the job description with the department within three days will result in 2 scores, within five days in 1, and above in 0 scores.
– Get the evaluation done within one week will be rewarded with 1 score.
– Receiving the salary proposal within one week will be rewarded with 1 score.
– Updating the job description document with the salary information and with the changes proposed by the quality assurance within two days will result in 1 additional score.
– Receiving an approval/denial by the committee within two weeks (they are meeting only twice a month) will result in 1 score.
– Getting an approval by the committee in the first attempt is a challenge for all process participants contributing so far. Hence, 5 extra scores are given to each participant involved in this case prior to approval.
– Working on a requested update after a job description denial within two weeks will result in 1 score.
– Sending out the approved job description within 2 days will result in 1 score.

Meeting KPIs within a business process execution environment could be measured by applying approaches such as proposed by Herzberg et al. [3,4].

Rewarding collaborative tasks fosters the interaction between participants and encourages them to team up, e.g., in phone calls or personal meetings, instead of just handing over work items. Furthermore, the interaction partners of the business process can earn points with their immediate contribution.

Points earned in either of the above ways, or by means of successful process improvement, if the participant is a champion, can – in turn – be spent on supporting particular process model improvement proposals, which other champions propose. Thereby, process model improvements are evaluated by all process champions. Promising process model improvements will be promoted by the support of many process champions, non-promising improvements will be downgraded. Successful process model improvements that result in value for the company will be rewarded by points, whereas improvements that are not implemented or not successful will result in the loss of the spent points. This, however, requires that process management respects the impact of improvement promotions by champions.

4   Game Credits

In this paper, we outlined how the principles of gamification can be applied in business process management to support onboarding new process participants, engaging participants in efficient process execution, and improving the process. Completing process activities and accomplishment of challenges is rewarded with

process scores and the development of individuals is awarded with badges. These unlock new levels of responsibility, e.g., to mentor new process participants or vote for process improvement proposals. A case study has been presented using the example of a job description process designed for a German health insurance provider.

We already envision various directions for future research. First and foremost, a study needs to be conducted to evaluate how and to what extend knowledge workers get influenced by a gamified business process execution environment. We have discovered arguments that support a positive effect on process performance, but also ones that suggest the opposite, i.e., overall performance decrease.

One potential reason for a negative impact is the risk of tricking the system. If, for instance, only the execution of few pilot business processes is gamified, employees may concentrate their effort on these processes, while non-gamified work falls short. Also, scoring measures may be cheated, if they are not carefully designed.

Additionally, rewarding of efforts shall be investigated in more detail. This includes aspects such as rewarding collaborative efforts in more detail, e.g., by distributing scores received as a team to the individual team members according to their respective contribution to the joint achievement. Also, negative rewards in case of insufficient performance need to be explored.

Finally, we argue that, for gamification to become successful, it should be incorporated into the lifecycle of operative business process management, and not only in its execution phase. We envision modeling aspects that allow the specification of gamification mechanisms and measures directly in the business process models, such that they are also implemented when the model is put into operation.

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