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How to gamify? A method for designing gamification

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Abstract

During recent years, gamification has become a popular method of enriching information technologies. Several business analysts have made promising predictions about penetration of gamification, however, it has also been estimated that most gamification efforts will fail due to poor understanding of how gamification should be designed and implemented. Therefore, in this paper we seek to advance the understanding of best practices related to the gamification design process. We approach this research problem via a design science research approach; firstly, by synthesizing the current body of literature on gamification design methods and interviewing 25 gamification experts. Secondly, we develop a method for gamification design, based on the gathered knowledge. Finally, we conduct an evaluation of the method via interviews of 10 gamification experts. The results indicate that the developed method is comprehensive, complete and provides practical utility. We deliver a comprehensive overview of gamification guidelines and shed novel insights into the overall nature of the gamification development and design discourse.

1. Introduction

During recent years the enhancement of information technology via design features borrowed from (video) games, also known as “gamification” [20], has become a notable development both in academia and industry [15]. Gamification primarily aims at increasing users’ positive motivations towards given activities or use of technology, and thereby, increasing the quantity and quality of the output of the given activities [14, 20]. Business analysts suggest that more than half of all organizations will have gamified parts of their processes by 2015 [12, 21]. In the academic realm, several studies in various contexts have shown that

gamification can be an effective approach to increase motivation and engage users or participants in a given activity (see e.g. [15, 29] for reviews).

However, it has also been predicted that a majority of gamification implementations are doomed to fail due to poor understanding of how to successfully design gamification [13]. This gap canonically often manifests as modest gamification designs commonly consisting only of simple mechanics, such as point, badges and leaderboards [15, 29]. Gamification is difficult to design: 1) The source of innovation; games, are complex, multifaceted, and therefore, difficult to holistically transfer to other environments, 2) gamification involves motivational information system design [14, 20] which entails understanding a host of (motivational) psychology, and 3) the goal of gamification is commonly also to affect behavior which adds yet another layer into the scope of gamification design.

This dearth in comprehensive understanding of the phenomenon continues to inhibit organizations from adopting and designing effective gamification approaches. Thus far, only few sources exist that provide methodological insights (e.g. [7, 16, 28, 34]) and practical guidance on designing gamification (e.g. [8, 27, 33, 39]). However, most of the frameworks have not been empirically evaluated and have been developed in a vacuum. In this sense, the frameworks do not draw on each other but rather inhabit separated areas.

Therefore, in this paper we seek to advance the understanding of best practices related to the gamification design process. Applying design science, we approach this research gap via combination and synthesis of the current isolated gamification design frameworks, as well as by interviews with gamification experts on their actual practice. Secondly, we develop a method grounded in this knowledge using method engineering [4] and derive requirements for gamification projects. Finally, we evaluate the proposed gamification framework based on semi-structured interviews with 10 gamification experts and discuss our findings.

2. Data and methods

Given the study's focus, we opt for a design science research (DSR) approach [19, 26] implying that the research process consists of two primary modes of investigation and their interplay: 1) developing/building theory-ingrained artifacts and 2) evaluation of the developed artifacts. More specifically, in the context of the present study the developed artifact is a method for designing gamification approaches. The evaluation phase is based on interview investigations.

In order to develop a holistic perspective on the subject matter and in order to derive the corresponding requirements, this study relies on multiple sources of data. Since the process of gamification is relevant to both, practitioners and academics, we also collected insights from both realms. We extracted the scholarly experiences from the literature (practitioner and academic outlets) and experiences from practitioners through interviews. Both data sources form the database that was used to develop our method.

2.1. Literature Review

In order to extract requirements, activities and deliverables from the literature, we conducted a hermeneutically-oriented iterative literature review [3, 38]. As a result of the first iteration, we identified design related key terms for an initial systematic literature search, resulting in the following search string: (*gamify OR gamification*) AND (*framework OR model OR design OR approach*). The first search included the following databases: ProQuest, ACM Digital Library, AIS Electronic Library, IEEE Xplore Digital Library. Using meta-databases included also non-IS domains e.g. Human-Computer Interaction. We also considered gray literature and practical outlets to increase the comprehensiveness of our findings [3]. As a result, our search identified 468 articles. In the following step, we removed duplicates and excluded articles based on title, resulting in 247 articles. A review of the abstracts reduced the number of articles to 35. Through a backward and forward search [38] we identified another 26 potentially relevant articles. We applied the same inclusion and exclusion criteria to focus on articles that present either a process model, articulate specific requirements or present other relevant information for the design of gamification. Consequently, another 5 articles were added to the literature pool. Thus, we consider a list of 41 (35 from the literature search +5 from back and forward searches) articles that include relevant information about gamification as our final body of literature. From

these articles, we extract the descriptions of methods, phases, activities, deliverables and requirements. In total, we found 17¹ gamification methods. For each identified method we documented a corresponding process-deliverables-diagram (PDD) [4] in order to build our method database. A PDD is twofold, it describes the method activities and phases on the left side, while it summarizes corresponding deliverables as outcomes of those activities on the right side.

2.2. Expert Interview

In order to complement and compare our requirements, activities and deliverables from literature we conducted expert interviews. We used different cues to contact over 90 gamification experts. Within this study, we consider an individual as an expert based on their publicly available information about their occupation. In particular, an expert has real world gamification project experience and shows strong interest in the subject matter (such as through i) being a speaker at international gamification conference e.g. the Gamification World Congress, ii) being part of a gamification association, or iii) being one of the most active gamification “influencers” in social media channels²). In total, 25 experts from 16 different countries participated in the study. 15 interviewees were gamification experts, 6 were consultants and 4 were academics. Following [31], we conducted semi-structured interviews to increase the replicability of the interviews and enhance the interview quality. While the first part of the interview focused on the extraction of requirements, the latter part focused on gamification approaches and deliverables. The interviews were conducted in English and German. With the permission of the interviewees, all interviews were recorded and transcribed. For each gamification procedure described in the interviews, we developed a corresponding PDD and extracted information analogue to those of the literature review. Additional information in the transcripts were coded and clustered.

The information gathered from both, the literature review and expert interviews constitute a comprehensive method database. By applying method engineering [4] the developed PDDs and their method fragments were analyzed for their allocation and comprehensiveness. Next, the individual fragments were compared in detail, aggregated and assembled for the construction of a new gamification method. In addition to the visualized elements of the PDDs, we summarized

¹ Highlighted in **bold** at the reference list.

² The social media activity was analyzed with the service “Rise” <https://www.rise.global/gurus> based on the data from October 2015

corresponding requirements for gamification projects to gain a comprehensive view [35].

3. Results

During our review of the literature and as result of our interviews it became clear that most models follow a similar process, with substantial differences in the details. Taken together, the activities of the considered methods can be divided into seven phases: (1) *Project preparation*: All activities that have to be executed before the project starts; (2) *Analysis*: Activities that are used to identify the necessary knowledge of users, processes and the project itself; (3) *Ideation*: Activities to come up with ideas for gamification designs; (4) *Design*: Designing of gamification approaches and creation of prototypes; (5) *Implementation*: Implementation of a gamification approach; (6) *Evaluation*: Evaluation and testing of the gamification approach; (7) *Monitoring*: Monitoring of the gamification approach after the release. We have made the division of the following sub-sections accordingly.

3.1. Project preparation

Eleven gamification methods in the reviewed publications and nearly all interviewed experts recommend to start with the identification of problems that should be addressed via gamification and to derive goals that could be used to measure the success of a gamification project (e.g. [10, 24, 39]). Nearly all interviewees confirmed this procedure in practice and emphasized that “many companies have a rough idea what they want to do, but it has to be clearly defined what the objectives are and how they can be measured” [I17]. The interviews highlighted that clear objectives are an essential requirement for successful gamification projects (Table 2). The goals should be used to guide the project and support the expectation management [I10, I12, I16, I17, I21]. Some authors [18, 36] also suggest the creation of a vision statement and initial sketches to better communicate the objectives among the stakeholders of a gamification project. Some experts have highlighted that the identification of goals should be focused on user needs and motivation problems, rather than on business objectives [I18, I19]. Furthermore, some authors reported that, as a part of this phase, it should be determined, whether gamification is an appropriate solution for the considered problem to begin with [7, 10, 16].

The information gathered through the literature review and the interviews collectively suggest that the main purpose of this phase is to clarify the gamification project’s objectives. Therefore, activities such as the *definition, ranking and justification of project objects* are recommended (cf. [39]). Subsequently, it

should be *assessed, whether gamification is applicable and suitable*. This activity and requirement was found in several sources (Table 2). The interviews indicate that a *project plan* with defined objectives, requirements and conditions, such as the budget, duration, project team etc. are a typical outcome of this phase [I15, I16, I20, I21, I22, I24] (Figure 1). Our overview also indicates that soft factors, such as the assurance of support from relevant stakeholders [I3, I10, I14, I21] and the expectation management [I10, I12, I16, I17, I21] should be clarified in the beginning.

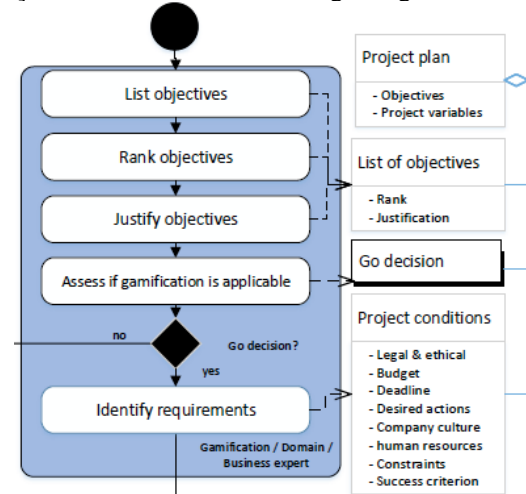


Figure 1. Activities of the preparation phase

3.2. Analysis (of context and users)

Gamification is typically applied in order to enrich information systems or services with motivational affordances for gameful experiences [20]. Therefore, it is reasonable that both, a profound understanding of the target group, as well as the characteristics of the system that should be gamified, is of particular importance to design gamification approaches. Most of the reviewed literature on the design of gamification have put significant emphasis on understanding the users but at the same time have largely neglected the importance of the underlying system that is being gamified. Only few studies provide details on the analysis of the application area (e.g. [5, 7, 24]). To collect and analyze information about the potential users of the gamified system, several methods were suggested. These including interviews [7], observations [I8, I2, I18], measurements of actual user behavior [39, I18, I22], analyzing of behavior chains [7], surveys [36], diaries and focus groups [28, I21]. All of these methods were also brought up by the interviewees. A special approach, called “activity-challenge-motivation triplets”, is proposed by Deterding [7]. This novel approach combines the user and context analysis and focuses on the identification of challenges and user motives in a given situation. A typical outcome of the

user analysis is a target group characterization and segmentation. Different activities to describe and cluster user groups, such as creating personas [27, 36] or categorizing the users with player types [34] can be found in the literature. In addition to a demographic characterization of the target group [28], especially the identification of motivational factors, needs and user goals has been highlighted in nearly all models and expert reports. The interviews confirm that the use of personas are a common practice [I12-I14, I18, I21, I23] (e.g. [6, 8, 33, 36, 39]) and that the use of segmentation frameworks, such as player types [2] or the Octalysis Framework³ could be beneficial for characterizing the target group. As can be seen from this triangulation of relevant literature and expert interviews, a wide range of methods has been deemed suitable for exploring and analyzing the attributes of the potential users.

The interviews indicate that the context analysis seems to be more important in practice, than it is described in the academic gamification literature. Especially in organizational contexts the understanding of the business processes, the corporate culture and technological constraints are often mentioned as essential requirements to design suitable gamification approaches [I6, I12, I15, I17, I24]. An interviewee suggested the creation of process models and scenario analysis (I17, cf. [30]). Another interviewee recommended the creation of user journeys in order to better understand and plan the behavior of the users within a given context ([I22], cf. [6]). Even if the user analysis seems to be of great importance, an expert highlighted that industry partners often do not fully understand why a user analysis should be conducted [I17]. Other experts have reported that the target user group may be very large and heterogenic, which can result in an ineffective user analysis [I8, I25]. In such cases, the interviewees recommended to focus on general user needs and motivations, such as the need for competence satisfaction [7, 20].

In summary, our data indicates that a thorough context and user analysis is a core requirement for the successful design of gamification approaches (Table 2). The context analysis is characterized by the *identification* and *understanding of the context*, where gamification should be applied. Furthermore, we found that the *definition of success metrics* should be conducted in this phase. Both, the interviews and the literature recommend this activity to be able to measure and monitor the success of a gamification design (Table 2). The user analysis focuses the *definition and characterization of target groups*, which includes the *identification of user needs, motivations*

and behavior in the current system. The reviewed methods indicate that the user information and segmentation are typically documented in form of *personas* (Figure 2). Depending on the context, a designer has to determine the granularity of the user analysis and segmentation. Relevant literature provides a wealth of detailed guidelines to support the activities of the user and context analysis [6-8, 17, 33, 36, 39].

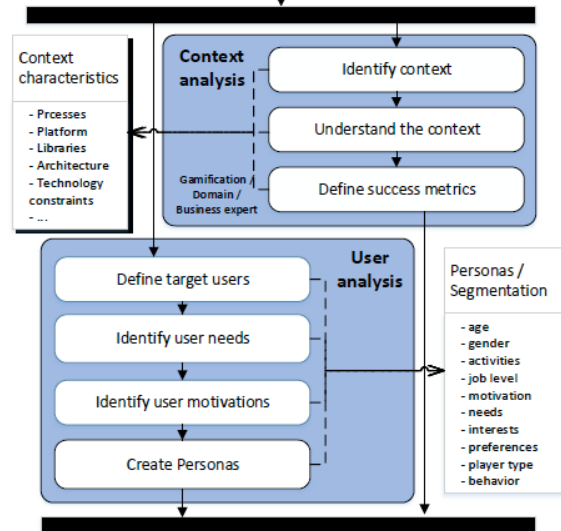


Figure 2. Activities of the analysis phase

3.3. Ideation

Once an overview about user and context characteristics has been obtained, the next step is to develop a gamification design. Surprisingly, we found that several published methods do not describe this core activity in detail. Most of the identified literature on the design of gamification specifically promote the creation of engaging challenges by the use of patterns known from games (e.g. [11, 16, 22, 24, 27, 28, 33, 39]). More particular, they argue for the use of game-design patterns and mechanics, such as rewards, points, badges, leaderboards or storytelling, as building blocks [27], and assume that the combinations of these elements can invoke engaging challenges and motivate goal-directed behavior (e.g. do X to unlock badge Y). Most of these methods emphasize the selection of elements, which match previously identified user needs and promote desired user behavior. Furthermore, some authors recommend to align gamification elements and mechanics, in order to promote repeated performance (“engagement loops”) along a “player journey” [17, 27, 39]. However, the detailed process of selecting and combining building blocks in order to design a concrete gamification approach often lacks descriptive details and only few authors provide information on the mapping of gamification mechanics to user’s needs [7, 33].

³ <http://octalysisgroup.com>

The interviews, on the other hand, indicated that the selection and design of gamification approaches is a creative process and require an ideation phase. The interviewees suggested that practice pays much attention to this creative process, resulting in a comprehensive list of gamification design ideas. The interviews indicate that the first step is typically an *iterative brainstorming activity (with the goal to come up with a large amount of ideas)* [I17, I19] cf. [7, 17, 22]. Explorative brainstorming has been highlighted as an important approach to understand the so called “design space” (i.e. the space of possible design alternatives) [I17, I19, 7]. Subsequently, the ideas are usually *consolidated* in order to create a *list of ideas* for the design phase [I17, I19, I22, 7, 36] (Figure 3).

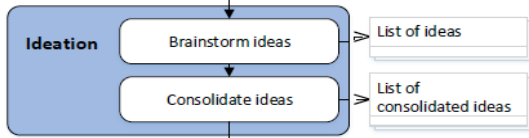


Figure 3. Activities of the ideation phase

Some interviewees recommended to focus the brainstorming on the fulfilment of user’s needs, desired behavior and target outcome, rather than on technology or game elements [I11, I14, I22, I24]. This view has also been adopted in current theoretical and conceptual views of gamification [20]. Five experts mentioned the importance of user involvement in the ideation phase, in order to ensure the focus on user needs (cf. Table 2). Nearly all interviewed experts reported that they follow frameworks, such as the User-Centered Design framework [28, 32], Design Thinking [I2, I11, 15, I16-I22, I25, 17], the Octalysis Framework⁴ [I6, I11, I12, I21], the Playful Experience framework (PLEX) [1, I19], Lazarroo’s 4 keys of fun⁵ [I16, I21] or the Person-Artifact-Task (PAT) model [9, 10] in order to guide the ideation. Interviewees also mentioned the use of creative techniques, such as “buddy storming”, “brain writing” or “proxy thinking” in workshops with users, designers and other stakeholders [I15-I17, I20]. Furthermore, we identified a set of tools and techniques, which are used in practice to stimulate and guide the ideation phase (Table 1). For example, five experts mentioned that the playing of games and the discussion of mechanics in board and video games can stimulate the mindset and support ideation. Some experts stress the importance of coming up with an epic theme or a narrative to guide brainstorming and glue design elements together ([I1, I7, I8, I11, I21, I24], cf. [33]). The literature provides additional

⁴ <http://octalysisgroup.com>

⁵ <http://www.nicolelazarro.com/the4-keys-to-fun/>

approaches. For instances, [7] proposes the use of “innovation stems”, inspiring prompts that guide and engage brainstorming (e.g. “How might we spark a sense of pride in an assembling process?”).

Table 1. Ideation toolbox used in practice

Tools	Purpose
Board and Video Games	Playing of games and discussion of game mechanics can stimulate the mindset and support ideation [I1, I2, I10, I14, I25], [36].
Design Lenses	Design lenses [7] provide a special perspective on a design space to guide ideation and design in a particular direction [I2, I6, I11, I16].
Design Cards	Design cards mostly contain design lenses, such as basic human needs. Random and playful brainstorming with these cards can help to come up with ideas for gamification [I2, I8, I11, I16, I17, I19], cf. [1].
Visualizations	Visualizations (e.g. process models) are used to understand and communicate the relationships between users and their behavior in the considered environment [I11], cf. [30].
Game design patterns	Commonly reoccurring parts in games are often used as foundation to develop ideas for gamification approaches [I7, I8, I9] (see [15, 27, 29, 33] for typical patterns).
Story Cubes	Dices with different icons, which are typically used to support the creation of stories. The story in turn can then be used as starting point to develop design ideas [I8, I11], cf. [33].
Canvases	Structuring of gamification ideas in a systematic way. Canvases can help to communicate ideas, identify weaknesses and compare approaches [I5, I16, I17, I22] (e.g. [8]).
Decision trees	Decision support and guidance for e.g. the selection of game elements and mechanics [I18], cf. [28]
Best practice / gamification pattern	Best practice examples and reoccurring parts in gamification approaches are used as starting points for the ideation [I14, I22, I24], cf. [6, 16, 17, 27, 39].

3.4. Design of prototypes

After collecting ideas, concrete gamification designs can be developed. This step is strongly related to the ideation phase and focuses on the *elaboration of evaluable and, therefore, “playable” prototypes*. Both, the literature and interviewees recommend the rapid development of prototypes, e.g. in form of paper prototypes, sketches or wireframes [7, 18, 22, I7, I8, I14, I19, I21, I22] to *iteratively* test the success of a design idea. In general, several sources highlight that successful gamification approaches arise from an integrative design process (Table 2), in which ideas

and designs are *frequently tested and improved* until they seem to be efficient and promising to reach the previously defined goals [5, 7, 28]. The literature [10, 36] and 3 experts [I3, I17, I22] suggest to create a *development concept* as outcome of this phase (Figure 4). This concept contains all relevant information for the implementation. The interviewees also reported that sometimes a transition is performed at the end of this phase. In this case, the gamification designer hands the project over to a team of developers [18]. Due to the different activities in this phase, several experts mentioned that the gamification designer requires interdisciplinary skills, such as a profound understanding of human motivation, game design, business processes and information system design (Table 2).

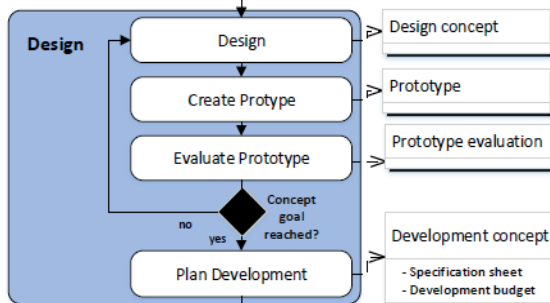


Figure 4. Activities of the design phase

3.5. Implementation of a design

The majority of the methods in the reviewed body of literature contain an implementation phase. However, little information about the details of its content are outlined. It can be summarized that the purpose and outcome of this phase are the development of a *pilot*, which can be used for field evaluation of the gamification design [10, I15, I22, I24]. Several authors describe the implementation as a continuation of the prototyping [5, 7, 10] and recommend an iterative procedure in development cycles [22, 39]. *Continued user and play testing* after each cycle is recommended to evaluate and optimize the designed mechanics. The interviews suggest that the concrete proceeding within this phase is determined by the decision (A) to *develop the gamification approach with an own team*; (B) to *use external developers* or (C) to *adapt the design to an existing gamification platform*. Most experts reported that they usually build gamification solutions within their own team. Some reported that they use external developers [I10, I17, I21, I22] or developers of a client [I10, I13, I14, I17, I21, I22]. A few times, the *use of available gamification platforms was mentioned* ([I22], cf. [18, 22]). An interviewee emphasized the importance of the project management and recommended the involvement of the gamification experts within the development process [I14]. When developers have no experience with the development of gamification

platforms, they should be trained, for example towards the often event-driven architecture of a gamification system [I19].

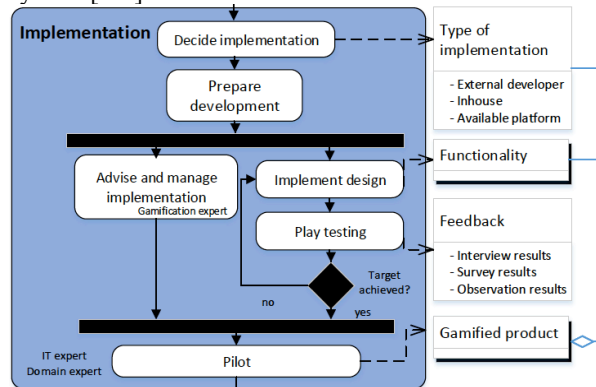


Figure 5. Activities of the implementation phase

3.6. Evaluation

Aim of the evaluation phase is to investigate, whether the developed gamification solution meets the defined objectives. Several approaches to evaluate a gamification design can be found in the literature. These range from quantitative to qualitative approaches [10, 11, 16, 24, 36]. The interviewed experts reported that they typically conduct interviews [I9, I12, I19, I21, I22, I25], surveys [I1, I22, I25], impact studies [I19] or A/B-testing [I18, I23]. Moreover, playtesting was one of the most mentioned evaluation methods. Playtesting refers to the observation of users while undertaking a task in a game [7, 10]. Several experts have highlighted that observing user behavior is more effective than interviewing, as users often have problems to describe experiences verbally [I7, I11, I18, I21]. Further evaluation techniques can be found in the literature. An example is the use of a service quality model to measure the effectiveness of a gamification approach [11]. The surveyed experts stressed that in commissioned work the evaluation is often done in a lean manner or omitted altogether, since often no budget is set aside for the evaluation phase [I15-I17, I21, I22]. In these cases, the pilot is just launched.

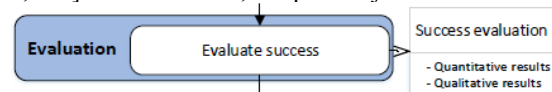


Figure 6. Activity of the evaluation phase

3.7. Monitoring

Whereas some articles see gamification as a (never ending) iterative process of design, development, evaluation, monitoring and adaption [33], the reviewed studies and practical guidelines have largely omitted this aspect. Most simply recommend a *launch and post-launch monitoring* (see [7] for an overview). The interviews indicate that practitioners often see

gamification projects as classical software projects with a clear start and end [I17]. Therefore, monitoring and management is often not planned and budgeted in practice [I12, I14, I15, I21]. However, more than half of the experts emphasize that gamification projects should not be considered as typical deterministic software projects. “A successful gamification project should never end, because it will become part of how the organization works” [I3]. Most experts recommend a monitoring phase; in which the system usage is investigated in regular intervals. The collected data is used to evaluate the implemented game mechanics, to identify irregularities and to check whether the desired user behavior is achieved. Based on the gathered insights, mechanics, rules and contents should be balanced and tweaked in order to keep the system engaging and to adapt it to changing objectives. A typical outcome of this phase is a *list of improvements* (e.g. adaption of parameters in the implemented game mechanics [I4, I21] or a plan for a new release [I2, I14]). Furthermore, the use of A/B-testing has been mentioned as an approach that continuously optimizes parameters of gamification features [I11, I19].

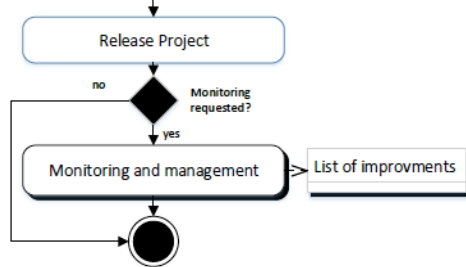


Figure 7. Activities of the monitoring phase

3.8. Requirements for gamification projects

With the aim to provide a comprehensive view, we gathered and summarized all essential requirements for successful gamification projects as a result of our literature analysis. We also asked experts for the most important requirements. We aggregated the data and compared the theoretical view with the lived experience (Table 2). We summarized them into seven most important requirements for designing gamification.

First, it could be concluded that a profound understanding of users, their motivation and needs, as well as of context characteristics are fundamental requirements for gamification projects. The interviews showed that the experts typically recommend to focus on user needs instead of business goals in the overall design process. The experts also mentioned user involvement in the ideation and design phase as requirement. *Second*, the literature and interviews highlight that the objectives of a gamification project should be defined clearly. Clear project goals are essential (1) to guide the overall project, (2) to evaluate

the success of a gamification approach and (3) to be able to assess, whether gamification can be used to achieve the desired objective. (2) and (3) were also frequently mentioned as requirements for gamification projects in the interviews. *Third*, nearly half of our sources recommend to test gamification ideas as early as possible. In this context, an iterative ideation and design process with regular user tests was often mentioned as additional condition for successful gamification projects. *Fourth*, gamification should be perceived holistically without falling into the pitfall of using simplistic gamification mechanics, such as points, badges or leaderboards. Especially the interviews canonically highlighted that gamification designers need profound knowledge in game / gamification design and human motivation. The models found in the literature are a helpful start, but the experts emphasize that these frameworks cannot replace the knowledge, creativity and experience that is needed to design solid gamification approaches. The literature mentions this point often not explicitly, but provides manifold introductions to motivation theories and game design (“thinking” [17, 39]). *Fifth*, the interviews indicate that gamification projects fail due to a lack of understanding among key stakeholders. The literature highlights that projects fail if legal and ethical constraints are not considered in the design phase. *Sixth*, the literature recommends to control and curb for cheating/gaming the system. Moreover, we found that possibilities for cheating can reverse the effects of gamification and discourage users. However, some experts reported that cheating can help to better understand the users and to optimize gamification designs. *Seventh*, the literature recommends continuous monitoring and optimization of gamification projects as a prerequisite for long-term success. The interviews showed that in practice gamification projects are often planned with a small budget and limited timeframe. In these cases, practitioners typically focus on the ideation, design and development phases. Evaluation and monitoring are often neglected. Some experts noted that, therefore, sometimes gamification projects fail and miss the objectives. All requirements form the foundation of successful gamification and are directly incorporated into the development of the method described above.

4. Evaluation of the method

Finally, we evaluated the developed gamification method via expert interviews [31]. All 25 experts had been invited to participate in a second evaluation interview. While twelve experts initially agreed to participate and evaluate our results, we received two last-minute cancellations. Hence, we conducted ten

Table 2. Requirements for gamification projects

Requirements	Literature	%	Interviews	%
1. Understand the user needs, motivation and behavior, as well as the characteristics of the context	5; 6; 7; 8; 10; 11; 17; 27; 33; 34; 36; 37; 39	72	I2; I3; I4; I6; I7; I9; I11; I13; I14; I16-I20; I21-I25	76
2. Identify project objectives and define them clearly	5; 6; 10; 11; 17; 22; 24; 27; 33; 34; 37; 39	67	I3; I8; I11; I13; I16; I19; I21; I22; I24; I25	40
3. Test gamification design ideas as early as possible	5; 6; 7; 17; 22; 33; 36; 37; 39	50	I1; I3; I4; I9; I11; I14; I18; I19; I22; I24	40
4. Follow an iterative design process	6; 7; 10; 22; 27; 28; 33; 36; 39	50	I2; I9; I10; I11; I17; I22; I18; I19	32
5. Profound knowledge in game-design and human psychology	16; 18	11	I1-I4; I6; I9-I16; I18; I20-I22; I25	72
6. Assess if gamification is the right choice to achieve the objectives	6; 10; 16; 17; 34; 39	33	I1; I10; I13; I14; I17; I19; I22; I25	32
7. Stakeholders and organizations must understand and support gamification	6; 17	11	I2; I3; I9; I10; I12; I13; I15-I17; I18; I24; I25	48
8. Focus on user needs during the ideation phase	6; 11; 17; 27; 33; 39	33	I6; I11; I16; I18; I22; I25	24
9. Define and use metrics for the evaluation and monitoring of the success of a gamification approach	6; 7; 10; 11; 17; 27; 33; 37; 39	50	-	0
10. Control for cheating / gaming-the-system	6; 10; 17; 25; 27; 34; 37; 39	44	-	0
11. Manage and monitor to continuously optimize the gamification design	6; 7; 17; 27; 33; 34; 36	39	I19	4
12. Consider legal and ethical constraints in the design phase	10; 17; 27; 39	22	-	0
13. Involve users in the ideation and design phase	-	0	I1; I4; I11; I19; I22	20
% relative proportion to the number of considered sources within the literature or the interviews				

semi-structured interviews [E1-E10]. Each interview contained both, a survey to evaluate the model in general, as well as an open portion to evaluate specific parts of the model. Following [23], we focused the evaluation on the semantic quality (feasible completeness and validity), on the pragmatic quality (feasible comprehension and understandability) and lastly on the practical utility.

All interview partners stated that the model is understandable and also presented in a readable format. However, for its application it was highlighted that a fundamental understanding of gamification is required beforehand [E4, E9]. 9 of 10 interview partners agreed or strongly agreed that the method is complete and contain all relevant steps. Two experts have criticized that the model provides little assistance for the choice of gamification elements [E4, E9]. However, as the majority of the interviews showed that in practice gamification is a creative and iterative design process, we assume that the use of frameworks that define strict guidelines for the use of gamification building blocks may harm needed creativity. Additionally, we added an overview of techniques, tools and frameworks that may support the ideation (Table1). Furthermore, some small recommendations to improve the model have been collected. These include the comment that the user

journey should be integrated in order to invite designers to think about long-term engagement [E8], the aspect that problems in the implementation can lead to a new design phase [E2] or that the budget should be considered during the ideation phase [E4]. 9 out of 10 agreed that a project would probably be successful using our process (assuming that it was executed correctly). In general, the model got positive feedback with some interview partners even saying that they would like to try the model in their work or reflect their model with our results [E2, E6, E7]. The results of the evaluation were included in our final model, which is available as download at gamification-research.org.

Most interviewees agreed with the identified requirements in Table 2. The iterative design process aroused the most discussions. Generally, the experts agreed that design and development should be iterative, but commissioned work does not always allow an iterative procedure [E8, E10]. [E10] recommended to not iterate and test too early, as gamification often needs a certain maturity in order to get solid results. Regarding the assessment whether gamification is the right choice, [E4] argued that this has to be decided before the project starts. Others shared the opinion that gamification can be applied almost always [E2]. The creativity of the designer creates the borders.

5. Discussion of the research findings

The review and interviews shed novel insights into the overall nature of the gamification development and design discourse in both, academia and practice. We found interesting differences and overlaps between previously published methods for designing gamification and the actual practice of companies attempting to gamify. *First*, nearly all of the experts and reviewed gamification method related pieces of literature unanimously agreed that gamification design should follow an iterative, user-centered design process with high degree of user involvement as well as early testing of design ideas [6, 7, 10, 22, 27, 28, 33, 36, 39]. While iterative and user-centric design are hardly novel approaches in software development, our data is canonical about the crucialness of these approaches since gamification applications are exceedingly complex information systems. Gamification requires holistic information system design; taking into account not only the stellar technical aspects but also the manifold and multidimensional aspects of user psychology and engagement [7, 20]. *Second*, we identified that several methods in previously published literature are not detailed enough to provide sufficient practical guidance (e.g. [5, 11, 16]). Most experts reported that they not follow a published method since most methods cannot completely cover the complexity that results from the nature of human motivation and the various application areas for gamification [15, 20]. Some experts have even noted that current methods are limiting the creativity and the possible design space if followed strictly. However, the experts generally agree that frameworks, which offer guidelines for the identification and allocation of gamification building blocks on different user characteristics (e.g. [27, 33, 39]), can partially useful for developing gamification designs and to support the ideation. *Third*, we found differences in the design process between the review and the interviews. We identified that due to the complexity, the selection of game-design elements and game mechanics is often more creative and brainstorming based in practice, than it is described in current literature [7] (e.g. [11, 16, 24, 27, 28, 39]). Previously published methods often lack a detailed description of the creative ideation and design phase [5, 11, 24, 27]. Therefore, we have included the ideation phase in our method and collected a set of tools and frameworks that have been employed in practice and may help in emergence of gamification ideas and designs (Table 1).

6. Conclusion

In this paper we sought to advance the understanding of best practices related to the gamification design

process. We tackled this research problem via a design science research approach; firstly, by synthesizing the current body of literature on gamification design methods and interviewing 25 gamification experts. Secondly, we developed a method for gamification design and derived requirements for successful gamification projects based on the gathered data. The evaluation of the developed gamification method, undertaken by 10 gamification experts indicated that the developed method is comprehensive, complete and provides practical utility. Several practitioners reported that they would try the method in their projects.

7. References

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