A Matrix for Gamifying Development Workshops

Kristina Maria Madsen(✉) and Mette Hjorth Rasmussen

Aalborg University Business School, Fibigerstræde 2, 9000 Aalborg, Denmark
{krma,mhl}@business.aau.dk

Abstract. The interest in potentials of gamification for innovating businesses through collaboration and innovative development in businesses has been an ongoing topic in gamification research for the last decade. This based on the theoretical notion of gamification's potential to facilitate "third space communication" and games capability to improve user engagement in non-game settings by transforming this space into a "magic circle" of gameplay for innovative thinking. In this paper an initial matrix is presented for discussing the parameters of gamifying development sessions or workshops conducted throughout innovation and development processes. The purpose of the matrix is to visualize the parameters involved in deciding the level of gamification for a workshop setting. Thus, a tool for identifying a balance in implementing game mechanics, one that can serve to support and facilitate innovative processes rather than purely creating and playing a game for its own sake. Therefore, through this paper the parameters of the matrix and gamifying facilitation of innovative development processes through gameplay, is discussed and presented. This is followed by the exemplification of use and application of the gamification matrix through four gamified workshops.

Keywords: Gamification · Innovation · Workshop design

1 Games as a Workshop Facilitation Approach

The interest in the potentials of gamification for innovating businesses through participant innovation [1–3] or for collaborative and innovative development in businesses [4, 5] has been an ongoing topic in gamification or "games with a purpose" [6] research for the last decade. Fundamentally, this approach demonstrates the potential of game mechanics and associated structures to enhance the motivational affordances of collaborative work [6, 7], which can facilitate innovation. Thus, when discussing development workshops in this paper, we are broadly referring development sessions conducted throughout innovation and development processes in businesses, it being design of a business or concept or products within a business.

Facilitating innovative development processes can be complex. There are many ways to approach development processes because, as Brown [8] describes, innovative design is a product of interdisciplinary team efforts, where "*all of us are smarter than any of*

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us" which is key to unlocking the creative power of any organization. Cross [9] points to the fact that the participants of interdisciplinary collaborations assume different roles in development processes rather than just representing their profession. They assume a social role in the group dynamic as e.g. a facilitator, one who takes charge, etc. As Brown [8] describes it, it is through group dynamics that we can distinguish between the terms multidisciplinary and interdisciplinary. Interdisciplinarity occurs when multiple professions collectively take ownership of ideas rather than advocating for their own respective domains.

Sanders and Stappers [10] propose generative tools as an approach to creating a shared language for the participating stakeholders to communicate and discuss ideas, requirements, potentials, limitations, and dreams. Sanders and Stappers describe generative design methods and research as a way to provide this shared language: "*Generative design research gives people a language with which they can imagine and express their ideas and dreams for future experiences. These ideas and dreams can, in turn, inform and inspire other stakeholders in the design and development process"* [10]. By approaching a collaborative development process through generative workshops, stakeholders can be supported in developing a common interdisciplinary language, one which can make their different ways of seeing, thinking, and doing come together in agreement – from multidisciplinary to interdisciplinary. Gudiksen and Inlove [4] approach the generative toolbox idea through the relevance of gamification and game design as a facilitating method for collaborative and innovative development in businesses. Gudiksen and Inlove [4] propose that games and game-based design can facilitate better communication, break down silos and engage staff. Thus, games can be used as a method for facilitating development processes and initiating shared language between participants.

The logic of using games, or more specifically, gamification, for facilitating innovative development processes is based on multiple perspectives. First of all this paper builds on Deterding et al.'s [6] definition of gamification as being an "umbrella term for the use of video game elements (rather than full-fledged games) to improve user experience and user engagement in non-game services and applications". Furthermore, the logic of using gamification is based on how games can act as a space between spaces through the concept of "third space communication" [4, 11] and "the magic circle" of games [12]. The "Third Space" can be described as the space that exists between two or more participants with different professional domains, as visualized below in Fig. 1.

Each participant is unique in their knowledge and background, and in their history and specialized language, which they bring into a development process. With these different backgrounds, confusion and misunderstandings can arise between the participants in a development process. The argument is therefore that the third space offers a way to facilitate and mediate between participants through the use of generative tools, by which participants can work toward a common goal.

"The Magic Circle" is a core concept in game design that can be explained as the space in which a game takes place [12]. The magic circle formalizes the game space, as you can see visualized in Fig. 2 below, in which game rules create a special set of meanings for the players in the game setting and guide the game. In the magic circle, the players accept the boundaries of the game rules in order to experience the pleasure a game can afford.

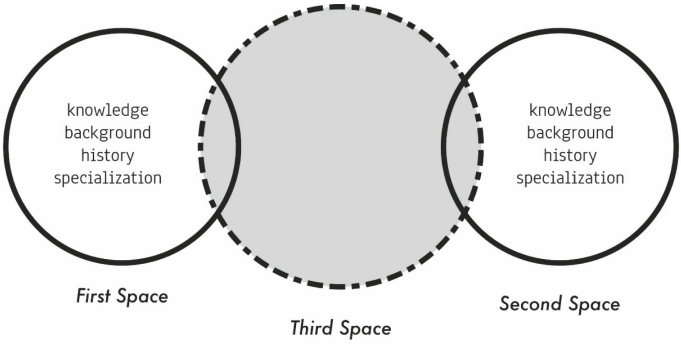

Fig. 1. The figure shows first, second, and third spaces. The "Third Space" is the space that exists between two or more participants, e.g., the first and second spaces, which have different professional domains. The figure was redrawn based on [4] and its third space figure (p. 8).

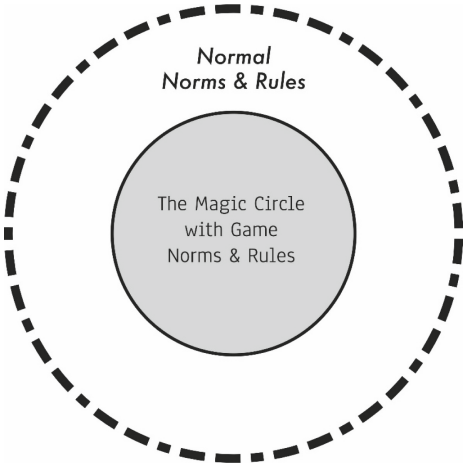

Fig. 2. The Magic Circle is the circle with the solid line, indicating a game situation with norms and rules that work to create a separate space from that of the norms and rules of everyday lives, which is visualized as the dotted circle.

The purpose of presenting the concept of both the third space and the magic circle is to start exploring the potentials of games and gamification as the facilitator of the third space. This is based on the argument that bringing participants together in a workshop setting may be insufficient when striving for an innovative development process; a structure is required to engage in an innovative process whereby participants can be supported into engaging in a process that will enable the transition from multidisciplinary to interdisciplinary [8]. In other words, the argument is that a collaborative setting that includes the gamification of tools, methods and techniques can support stakeholders in developing a common interdisciplinary language [4, 10] and heighten the potential for innovation.

The idea of defining the use of games and game elements for facilitating collaborative development processes is not a new notion but rather builds on past research. As mentioned in the introduction, Gudiksen and Inlove [4] have published an extensive work on the "Gamification for Business,". Thus, games can be used as a method for facilitating development processes and initiating a shared language between participants. In a non-game workshop context, Sanders and Stappers [10] have compiled an explicit introduction and guidelines for conducting generative workshops that aim at innovating through the front end of design processes. Even though Sanders and Stappers [10] do not talk about gamification or games in regard to development workshops, they present foundational knowledge on how to use generative workshops as a research method to unlock creativity and innovation, which is a relevant framing for both game and non-game workshops. Both Gudiksen and Inlove [4] and Sanders and Stappers [10] focus on the collaborative aspect of creating a shared language through a third space. The difference lies in Gudiksen and Inlove [4] referencing gamification and games, and in Sanders and Stappers [10] mentioning generative tools as an approach to creating this third space and a shared language.

Gudiksen and Inlove [4] have compiled a wide range of gamification types for business games, discussing their potentials and game mechanics and structures, which they base on [4] the framed challenges and structures of gamification for business. Games as drivers for innovation is not limited to the previous examples. Patricio [2], presents a study on the game IdeaChef as an approach to address innovation challenges; or Madsen and Krishnasamy [13], who present a game as a dialogue tool for designing museum experiences. Lastly, Thomsen, Sort, and Kristiansen [14] have developed a set of booster cards as an inspirational and ideate tool to innovate business model configurations. These games have different contexts, purposes, levels of gamification, and facilitation, described in different ways. Nevertheless, the discussion of why which level of gamification and facilitation is chosen for the level of innovation is not clear.

There are examples of frameworks for understanding and creating gamified processes, but the connection between the level of gamification and facilitation chosen for the level of innovation is rather vague. Patrício, Moreira, and Zurlo [15] present a study exploring the relationship between gamification and the early stage of innovation in which they categorize the dimensions of gamification into early innovation, environment, game elements, and motivation; and further, through a range of case studies, they explore these dimensions based on the game elements, tools, challenges, and outcomes.

This goes in line with Gudiksen and Inlove's [4] presentation of the challenges and structures of business games. Roth, Schneckenberg, and Tsai [16] even conclude that research on gamification needs to balance the differing expectations of innovation while not losing coherence as a theoretical reference point. They also question the dark side of gamification for innovation and ask whether there is currently too much use of gamification.

Therefore, what we propose in this paper is how we can balance the gamification of third spaces so that the purpose of the game mechanics is to facilitate an innovative process rather than playing a game for its own sake. Thus, the question is asked: Which parameters are essential in balancing the level of gamification, and how can these parameters be transformed into a tool for defining and creating gamified innovative processes?

The purpose here being to create a matrix, that can support decision making in workshop planning for innovative development and for designing the right game fidelity for a given setting.

2 Gamification Fidelity of Workshops

When we discuss appropriate levels of gamification to support the facilitation of workshops, the discussion is built on the understanding that types of workshops can be defined based on a scale from dialogue to gamification, as visualized below in Fig. 3, depicting the gamification fidelity of workshops. Thus, different types of workshops are defined depending on the desired participant interaction in the workshop situation.

Fig. 3. Gamification fidelity in workshops from dialogue to gamification.

The first type of workshop is *workshop as dialogue*, which is placed closest to the *dialogue* end of the fidelity scale since it is characterized by being mainly founded in a dialogue, perhaps as a round table discussion based on a presentation. These types of workshops are highly dependent on the facilitator to take charge of the dialogue and to ensure that the setting is fruitful, depending on the desired outcome. This type of workshop often will not have any specific methods planned, and therefore it will not be relevant to introduce game elements on this level.

Moving a step further on the fidelity scale to *workshop as exercises*, an element of exercises is added to the workshop, but is not gamified. Here Sanders and Stappers' [10] generative toolbox approach can be rather relevant to facilitating the workshop. The addition of exercises requires a higher level of engagement and interaction from the participants, and the facilitator's role changes because, compared to the first type of workshop, the facilitator is now able to activate the planned exercises instead of controlling the dialogue, let the method support the participants' creativity and dialogue.

The third type of workshop, *workshop with gamification*, is characterized by the exercise element being gamified through the application of game mechanics as a facilitating approach for driving engagement and interaction between participants. As with *workshop as exercises*, the facilitator's role is to frame, guide, and activate the planned exercises and let the gamified method "do its magic". This allow the participants' creativity and dialogue to evolve. It is on this and the next workshop level that Gudiksen and Inlove's [4] approach to gamification for business is grounded; namely using gamified sessions to break down challenges in businesses.

The final type of workshop on the fidelity scale is *workshop as game,* which is characterized by the entire workshop being designed as a game. At this level of gamification, the workshop becomes a full *magic circle* [12]. The workshop or game session is a tight ruleset and guides the participants through the content of the workshop in the process of generating the desired outcome through designed challenges and quests. At this level, a facilitator and the introductory presentation should become irrelevant because the game rules, as with a regular game, should be self-explanatory and allow the participants or players to create the magic circle of a game session through the rule book.

It is important to stress that this list can be further developed and nuanced, but the purpose here is to outline where and which types of workshops we are focusing on for this paper, as well as to make clear that it is not in all situations that it is relevant to apply gamification or create a full game. To be able to make an informed decision on which type of workshop is relevant for a given situation, it is evident that when initiating a design process for a gamified workshop, some basic parameters need to be clarified before deciding on which level of gamification is relevant for a given situation to achieve the desired outcome. This is not just a decision on whether or not a gamified workshop is desired, but also on whether or not it is appropriate for a given purpose. Therefore, with this paper, we strive to create a matrix that will help avoid falling into "the dark side of gamification" [16].

3 The Parameters of a Gamification Matrix

In this section, we highlight parameters that are important to consider when using gamification as an approach for facilitating innovative development processes while, at the same time, recognizing that games are highly complex, multilayered systems. We have extracted the core parameters of designing/planning a workshop setting that are facilitated through different levels of game mechanics. These are converted into a matrix, presented at the end of this section, consisting of three parameters: *purpose and outcome*, *framing context and process,* and lastly, *game fidelity*. The matrix is intended as a framing tool for designing workshops, providing the workshop designer with a frame to make deliberate decisions on the level of gamification depending on context, purpose, and requirements.

3.1 Purpose and Outcome

Purpose and outcome, which is closely connected to the identification of challenges, such as those presented by Gudiksen and Inlove [4] and Patrício, Moreira, and Zurlo [15]. In all generative processes lies a purpose and intended outcome, which are often based on a challenge that is intended to be explored and solved through various processes. The desired outcome of a process or workshop is essential for deciding how and if gamification can be relevant. The axis for *purpose and outcome* differentiates between *mapping* and *innovation* (Fig. 4). This is because the workshop setting (gamified or not) that we are discussing in this paper is gamification's effect in innovative development processes for businesses.

Fig. 4. The Purpose and Outcome axis spanning from *innovation* to *mapping*.

Mapping in this context is understood as defining or visualizing a current state – the "*as is"* situation – in a given organization. This is often researched and mapped in the early stages of a design process, such as empathizing [8, 17]. Thus, mapping is a process of defining and agreeing on what the current state is for the participants and what the challenges and potentials are for the organization. Mapping is part of the empathizing stage of the design process and an important part of understanding on what foundation to innovate. Therefore, a gamified workshop can be just as relevant to, for instance, uncover a business' potentials and flaws, as it can be for exploring innovative endeavors.

The counterpart to mapping in this matrix is *innovation*, understood as developing or changing the existing "*as is"* situation of the company to a new "*to be"* situation depending on the purpose of the development processes. If innovation is the desired outcome, the workshop setting will often be determined later in the design process, such as in the ideation stage of the process [8, 17]. Innovation can take many shapes and assume different levels, from incremental to radical [18, 19], which is why it is important to be aware of the desired outcome before deciding on the level of gamification, since there is a difference in the way that we approach a workshop situation when striving for incremental or radical innovation. If we strive for incremental innovation, knowing the *as is* might need to be incorporated into the workshop game; whereas if the goal is radical innovation, the workshop game should be more focused on exploring out-of-the-box ideas. But the different shapes and levels of innovation is also why the axes between innovation and mapping need to be dynamic, since they should be able to incorporate all levels of innovation.

Thus, there are multiple levels of purpose and outcome, when talking about gamifying a workshop, but this axis is meant for discussing the desired outcome when using gamification as a driver for the workshop session as part of achieving the larger purpose of the development process. Therefore, the workshop designer needs to ask: What is the purpose of using gamification as an approach for this workshop session? What is the desired outcome? Are we striving to use game elements to encourage creativity and push participants out of their comfort zone to explore innovative perspectives? Or is it rather an approach to helping along a specific mapping process, one for which we need to unlock some specific knowledge and create this magic circle that needs to be realized before we can start innovating?

3.2 Framing Context and Process

The second parameter and axis; *Framing Context and Process,* is closely connected to the type of workshop that is desired for a given situation, as discussed in Sect. 2. This parameter requires a discussion on the context and process intended for the gamified workshop in order to determine which level of facilitation is desired for the workshop, since this is unequivocally connected to the level of gamification needed. If we want a workshop that is non-facilitated, it needs a strong set of rules and mechanics for the

participants to be able to play. Whereas if the game is highly dependent on facilitation, then game mechanics can be more dynamic and simple because there is a facilitator to help the process along. Therefore, this framing context and process axis differentiate between facilitated gameplay and non-facilitated gameplay (Fig. 5). Since this paper is based on Sanders and Stappers' [10] and Gudiksen and Inlove's [4] framing of generative tools, workshop approaches, and gamification for business, it is assumed that whenever the purpose of a workshop is innovation some level of facilitation is required to achieve a co-creative space for creativity between participants holding multible professions to achieve the desired interdiciplinary outcome.

Fig. 5. Framing Context and Process axis spanning from *facilitated* to *non-facilitated gameplay*.

At facilitated gameplay the facilitators role is not control the dialogue but to frame, guide, and activate the planned gamified exercises and let the gamified method facilitate the participants' creativity and allow the dialogue to evolve. The facilitator can help if there are misunderstandings, the progression slows, or disagreements occur. As a gamemaster, the facilitator can keep an objective position and let the participants unfold their creativity. With non-facilitated gameplay, a facilitator and introductory presentation become irrelevant, because the game rules, as with a regular game, should be self-explanatory. Thus, a workshop session at this extremity should be solely facilitated through the game rules which guides the participants through the content of the workshop in the process of generating the desired outcome through specific challenges and quests. Apart from the extremities of the axis, it can be argued that somewhere in the middle is a level of co-creation. Here the designer/researcher/facilitator becomes an active participant in the development workshop and not a mediator [10].

There are multiple levels of framing context and process, when talking about gamifying a workshop, but this axis is meant for discussing what role the workshop designer needs to assume in the workshop session and is based here on to what extent gamification is necessary as a driver or facilitator for the workshop session. Therefore, the workshop designer needs to ask: What is the context in which the workshop session is intended? Where in a development process is it intended to be played? Who are the participants? What are the roles of the different stakeholders? Is it necessary to have a facilitator, or can a game facilitate the desired outcome?

3.3 Game Fidelity

This leads us to the last axis and, for this paper, the most central one, *Game Fidelity*. The game fidelity axis is highly connected to the gamification fidelity of workshops as presented in Sect. 2 with Fig. 3. Here, the presented game fidelity axis represents the second half of the gamification fidelity of workshops (Fig. 3), which contains the two levels of workshops that entail levels of gamification. Apart from this, the axis is based on Deterding et al.'s [6, 7] definitions of gamification versus games. In *From Game*

Design Elements to Gamefulness: Defining "Gamification" [7], they present a figure (p. 13) that entails a vertical axis from *game* to *play* and a horizontal axis from *whole* to *parts*. In the top *game* part of the figure, they differentiate between a *whole* game as being *(serious) games* and a design with game *parts* as *gameful design (gamification)*. Therefore, based on Deterding et al. [7] and our gamification fidelity figure, this *Game Fidelity* axis differentiates between *gamification* and *game* (Fig. 6).

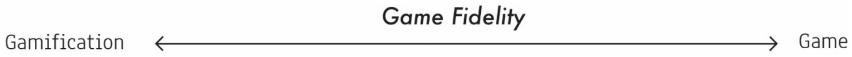

Fig. 6. The Game Fidelity axis spanning from *gamification* to *game*.

The right extremity of the *game fidelity* scale is *game,* which is characterized by an entire workshop being designed as a whole game. With this level of game mechanics, the workshop is no longer just a workshop using game mechanics but also becomes a full *magic circle* [12] of a game, one that facilitates the workshop or game session through a tight ruleset and guides the participants through the content of the workshop in the process of generating the desired outcome through specific challenges and quests. These types of games are what Deterding et al. [7] describe as (serious) games, because when using games in a business or development process, the game's purpose is no longer just for the sake of the game but also to achieve the goal of creating or getting something out of the gameplay. Furthermore, as described earlier, at this level of game fidelity, facilitation should become irrelevant.

At the other end of the scale we have *gamification*, which is characterized by a workshop session possessing various gamified elements through the application of game mechanics as a facilitating approach for driving engagement and interaction between participants. This level is also called *gameful play* in Deterding et al. [7], and it is defined by a design incorporating game parts. Thus, this level mimics a magic circle [12] to take advantage of the gamified method and let it "do its magic" by breaking down barriers [4] between participants and encouraging creativity and dialogue. Furthermore, as described earlier, at this level of game fidelity, a facilitator's role becomes to frame, guide, and activate the planned gamified exercises and not to control the dialogue.

Thus, there are multiple levels of game fidelity that need to be considered when talking about gamifying a workshop. This axis is meant for discussing which level of game fidelity is relevant when the workshop designers have decided on the other parameters of the gamified workshop.

Therefore, the workshop designer needs to ask; Which level of gamification is necessary to achieve the desired level of facilitation and outcome? What game mechanics [12] are relevant? What game mechanics are necessary to create the desired magic circle [12] around this third space [4]? Furthermore, it is relevant to consider whether the level of desired facilitation is unequivocally connected to the level of gamification needed in a workshop setting. The thought here is that the more unfacilitated a workshop can be, the more game-like the workshop game should be, with well-defined rules, mechanics, and artifacts that create a strong magic circle around the workshop and thereby make the process clear and approachable. This is in contrast to a highly facilitated workshop

setting, in which game mechanics can be used as creativity drivers in the workshop setting.

3.4 The Gamification Matrix

With the three axes and parameters presented and described, this section will present the gamification matrix (Fig. 7) for innovative development workshops.

The matrix thus summarizes the parameters that should be considered when designing gamified workshops and consists of the three axes visualized in the above three sections (Figs. 4–6). The gamification matrix is intended to provide a frame and tool for workshop designers to discuss the combination of the three axes. It is based on the desired game fidelity, outcome, and level of facilitation provided for a workshop with a customer, participants, or company that want a gameful design for their development process.

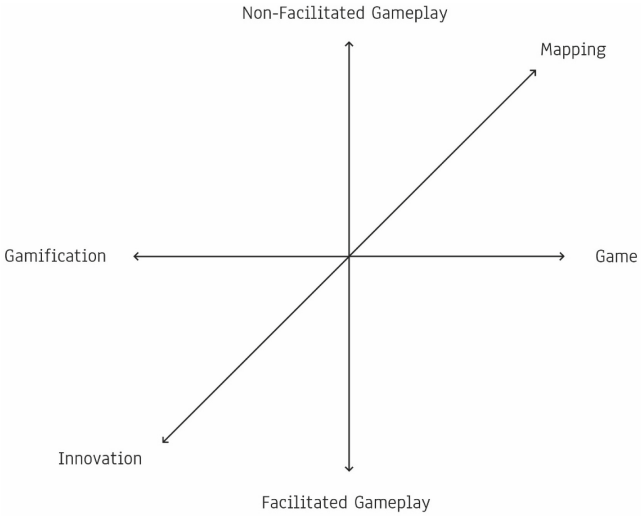

Fig. 7. The full matrix composed of the three axes: *game fidelity, purpose and outcome,* and *framing context and process.*

It is essential to find a balance between these three parameters, as discussed earlier in this paper, to avoid ending up on "the dark side of gamification" [16]. We argue that it is important for workshop designers to ask the overarching questions: What is the desired outcome of the innovation workshop? Why is gamification or a whole game the right approach for this specific development process? Where in the development process is gamification relevant based on the desired outcome – is it for mapping or innovation? It is also necessary to go into depth about each parameter with the questions described for each axis before gamifying a workshop.

In this section, we have outlined the gamification matrix and described the foundation of the different parameters that are relevant to consider before designing a gamified

workshop. This might be novel for experienced workshop designers, but with the continued interest in using gamification for innovation and development processes in business [1–6], it is crucial to have a framework to explain and discuss the parameters, limitations, and potentials of gamification with a business that wants to embark on a gamification adventure so that it can create a gameful design that fits with the desired outcome and avoids using gamification for the sake of gamification.

4 Game Cases

In this section, we will exemplify the use of the gamification matrix through the analysis of three existing games that are placed into the matrix and, lastly, a use case for which the matrix has already been used for framing a workshop game design. By looking at already existing games for innovation development processes, it is possible to place them in the matrix by looking at their purpose, the game mechanics they used, and the level of facilitation that was required. To do this, we have chosen three gamified approaches that have been documented academically [4, 13, 14] and can be used to visualize three different placements in the matrix to exemplify that workshop games vary between the parameters. Lastly, a use case that illustrates how the matrix is used for deciding on the level of gamification is presented.

4.1 Add Value

The first game presented here is *Add Value* [4, 20], which is a customer journey tool. Companies rely on unique opportunities to improve their services to customers. Therefore, the game seeks to sharpen the customer experience – where can value be gained, and where can time and resources be saved? At the same time, does the customers get the experience and service they expect? The game is designed to provide the players with insight into customers' needs for service, an overview of customer interactions with the company, and where efforts should be prioritized.

The game is designed as a fully functioning game with a board, a set of clear rules, steps to take, and artifacts. The purpose of the game is to identify, or rather *map*, the customer's experience of a given company that is playing the game. The game is designed so that it can be replayed multiple times to test different customer segments and can be repeated throughout the development process. The game is offered as both a facilitated and a non-facilitated game. Since it takes shape as a fully functioning game to buy, the exemplification used in the following matrix is the game without facilitation. This combination of elements places the *Add Value* game in the top right corner of the gamification matrix (Fig. 8).

Mapping: This game is placed at the furthest extremity of the purpose axis by mapping, since the *Add Value* game seeks to map customer journeys for a business segments. *Non-facilitated*: On the context and process axis, the game is placed high up close to non-facilitation, since the game is a fully functioning game that is facilitated by a rulebook rather than a facilitator (person).. This leads us to the last axis: game fidelity. *Add Value* is placed at the right extremity of the axis, since it is a fully functioning game that can be played for mapping customer journeys without facilitation.

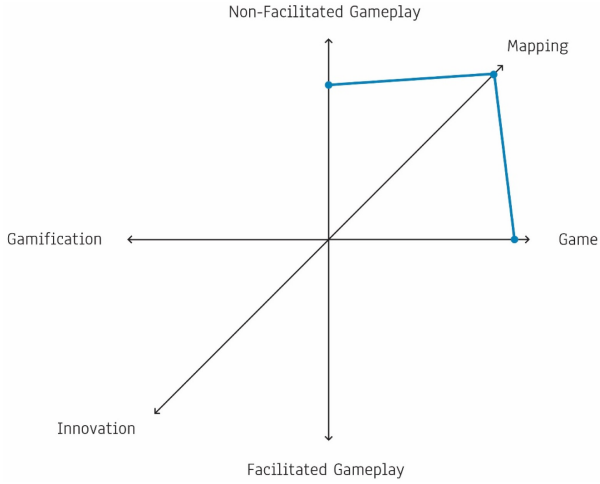

Fig. 8. The matrix with *Add Value* placed mainly in the top right corner, as a *non-facilitated mapping game.*

4.2 Our Museum Game

The *Our Museum Game* [13] is designed as a game for the innovation of interactive museum communication. The game is intended as a user-centered collaborative dialogue game, one that brings together different professions around the game to discuss new ways to communicate to their users based on the users' challenges. The *Our Museum Game* [13] uses game mechanics to drive and facilitate the progression and ideation throughout the game while being supported by questions to drive dialogue.

The game consists of a game board, a clear set of rules, and multiple game mechanics, such as time constraints, tokens, and roles [13]. The *Our Museum Game* uses these mechanics to guide participants through three design stages: *define, design,* and *evaluate*, thereby facilitating and visualizing a process of ideas, discussions, and choices rather than being an actual game. The game requires a facilitator with design knowledge to introduce the purpose and foundation of the game while being able to support the participants through the processes by answering questions, since the time constraints are tight compared to the complexity of the game. There is a ruleset and instructions for the game, which to some extent can be facilitated by the game or by an appointed gamemaster. But to achieve the full extent of the game, it needs facilitation. The game can be played multiple times or at different stages of the design process, either with specific challenges or just to explore potentials. This means that the *Our Museum Game* is placed in the far bottom of the purpose axis but closer to the middle on both the context and fidelity scales, as can be seen below in Fig. 9.

Innovation: This game is placed at the furthest extremity of the purpose axis by innovation, since the *Our Museum Game* seeks to explore new ways of communicating to museum users and not mapping museum practices as is. *Facilitated*: On the context and process axis, the game is placed between middle and full facilitation, since the game needs facilitation for framing and guiding throughout the game as an objective support

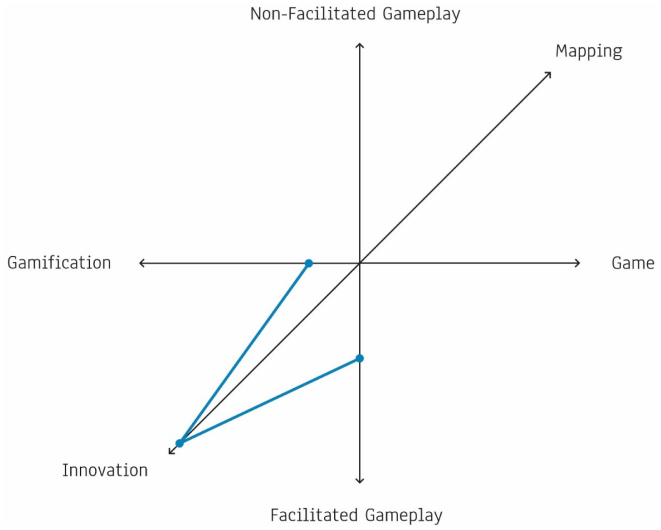

Fig. 9. The matrix with the *Our Museum Game,* which is mainly placed in the bottom left part of the matrix, as a mainly *facilitated innovative gamified workshop tool*.

to ensure that the game does not stagnate or end in frustration. *Gamification*: Lastly is the game fidelity axis, where the *Our Museum Game* is placed closely to the middle of the axis. As described above, the game does have quite a few game mechanics but is not a full-on game; rather, it uses game mechanics to drive the creative process and progression. Therefore, the game is placed close to the middle on the game fidelity axis.

4.3 Booster Cards

Booster Cards [14] is a deck of cards that consists of 71 business model configurations. The booster cards are used as a practical and generative tool in workshop settings to create a foundation for unlocking business model innovation (BMI). These booster cards offer hands-on experimentation with BMI through inspirational analogies and conceptual combinations to break down barriers, capture value potential, and generate new ideas. The cards in themselves are a game artifact and, through the descriptive paper [14], act as a guide for how to conduct a workshop with booster cards. The guide presents a workshop session that contains an *element of chance*, which can be defined as a game mechanic. Thus, *Booster Cards* can be defined as being at the border between a generative workshop with exercises and a gamification workshop. This is further underlined by the presented guide [14], which is made for facilitators and cannot be claimed to be a set of game rules. The authors also claim that *Booster Cards* cannot be a stand-alone solution. As such, *Booster Cards* is placed in the bottom left of the matrix, as can be seen in Fig. 10.

Innovation: This game is placed at the furthest extremity of the purpose axis by innovation, since *Booster Cards* seeks to generate BMI through inspirational analogies and conceptual combinations. *Facilitated*: On the context and process axis, the game is placed

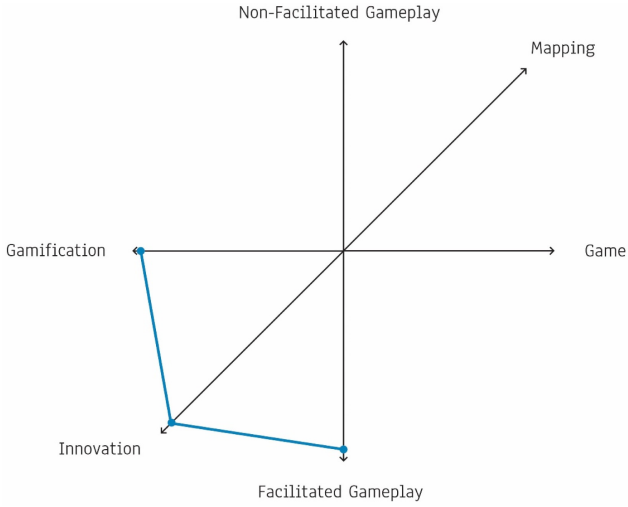

Fig. 10. The matrix with *Booster Cards,* which is placed in the furthest bottom left part of the matrix, as a *facilitated innovative gamified workshop.*

at the full facilitation extremity, since the game cannot stand alone and needs facilitation for framing and guiding of the workshop session and perhaps even a set of rules or constraints for the session. *Gamification*: Lastly is the game fidelity axis, where *Booster Cards* is placed at the gamification extremity. As described above, the game borders on being a generative tool rather than a gamified workshop approach. Since they are a deck of cards and thereby a game artifact that relies on an element of chance, *Booster Cards* is placed as close to gamification as possible.

4.4 Use Case - Cards for IoT

We have now presented three games and their placements in the gamification matrix to exemplify how they can visualize the construction and game fidelity of games. In this section, we will present how the matrix has been used in the development process to discuss and define an appropriate level of gamification based on the axes defined in this paper.

The gamification matrix's relevance and construction was tested when designing a game for IoT development and innovation in relation to business perspectives. This was done in collaboration with Force Technology that helps customers develop and implement new technological solutions. The task was broad and undefined in regard to the relevance of designing a game for solving the company's problem. Thus, using the parameters of the matrix to map and discuss the company's expected outcome of the game, its desired level of facilitation around the game, and at what stage of the development process the game was intended. The level of game fidelity relevant for this type of workshop session was identified.

Furthermore, the matrix functioned as a tool to visualize and discuss the level of game fidelity with the company to help them understand that we cannot just make a

game for the game's sake, but we must instead be mindful to avoid the dark side of gamification. By exploring the parameters of the gamification matrix with the company, it could be identified at which process stages the company intended to use the game with their customers, what the purpose of the game was, and what level of facilitation was desired, thus making it possible to design a game meeting the company's requirements while informing them of the importance of finding a balance when using gamification for innovation.

Thus, the initial discussion with the company framed the purpose for a workshop game as needing a game that can function as an icebreaker in the very beginning of an innovation process to make the company's customers aware of the possibilities with IoT and to familiarize themselves with the associated technologies and terminologies. This places this workshop session at the innovation end of the purpose axis (Fig. 11). In addition, the company would like its customers to think about how these technologies could affect the current business model and potentially innovate based on this, preferably in a facilitated setting in which the game would be played at the initial workshop in continuation of a short introduction to IoT and a whole development process. This places the workshop session at the facilitated gameplay end of the context and process axis (Fig. 11). This left us to identify and discuss the game fidelity placement. Another wish from the company was that the workshop game could be dynamic in such a way that it potentially could be played in two iterations and sent out to the customers beforehand to familiarize themselves with it and IoT. In this way, when they played the game with the company, they would already have some understanding of the game. This is partly what we saw with the *Add Value* game (Sect. 4.1), which can be played with or without facilitation. Therefore, we decided that we should aim at a full game, because then we could make dynamic rulesets depending on in which setting the company desired the game to be played. Thus, the game artifacts and content will be constant, and the rules or game mechanics can be differentiated depending on the situation. This places the workshop session at the game end of the game fidelity axis while also adding a dotted line to the middle of the matrix's purpose axis and the non-facilitated gameplay to the context and process axis (Fig. 11).

What this use case shows, is the matrix potential in being a supportive tool in discussing the purpose, context and relevant game fidelity for development workshops, to insure that the right gamified approach is being used for the given purpose of a workshop setting. Thus, insuring a more constructive workshop setting, that is optimized for its purpose and taking full advantage of the game mechanics applied. Whether it being fully fledge game or gamification.

As this use case and the three game examples show, it is evident that there are no straight answers to the gamification of workshops. What is relevant can always be discussed. Nonetheless, the matrix's axes provided a valuable tool for clarifying the motivation behind applying gamification and engaging in an informed dialogue with a company that wants to use this approach in innovative development processes. It can be discussed whether this is too novel for workshop designers, but these gamified workshops are not always created by designers who have a deeper understanding of gamification; therefore, it is crucial to have some kind of guideline or tool to help the assessment of

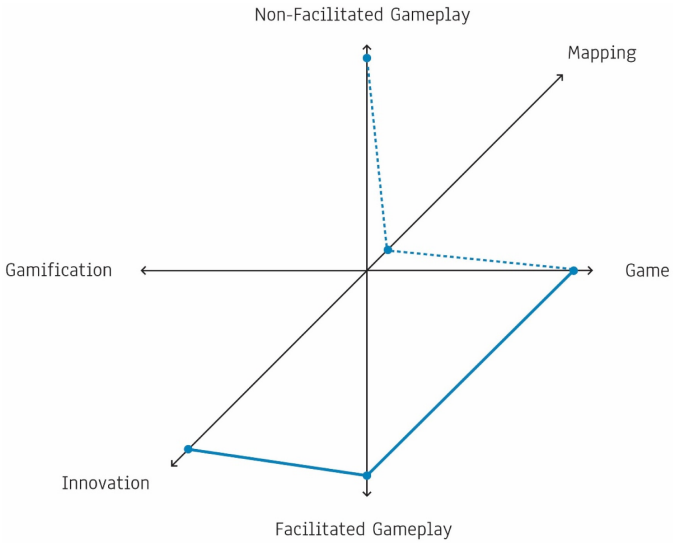

Fig. 11. The matrix with the *Cards for IoT*, which is placed in the bottom right of the matrix with a solid line and primarily in the top right with a dotted line, indicating the dynamic characteristics of the game design.

the level of gamification along to avoid the dark side and the overuse of a gamification approach in businesses.

5 Process and Discussion

Through this paper we have described and argued for the workshop session as a third space facilitated through games' magic circle based on different theories [4, 10], which leads to the definition of the matrix. In the process of using the matrix, in analyzing both the three existing games and the use case presented above, we learned that it is important to know the purpose of the game and the desired outcome before deciding on the level of facilitation, and that these two parameters combined give an indication of where to place the game on the game fidelity scale. This is because the nature of the workshop game is dependent on the level of facilitation, the purpose, and the outcome. We argue that a full game with a defined set of rules used for mapping will require no or less facilitation than a workshop with gamified additions to the exercises. The precise correlation between the parameters in the matrix is a matter for further research.

Therefore, it can be summarized that one of the lessons learned from the application of the gamification matrix is that the axes in the matrix should be addressed in the following order: (1) Purpose and Outcome, (2) Level of Facilitation, and lastly (3) Game Fidelity. Thus, the intent of the workshop and the relevance of gamification must be determined before deciding on the level of gamification.

Furthermore, the matrix provides a frame for discussing the needs for the game, thus providing a foundation for relevant game design. This paper only outlines the matrix and

the idea behind it. Therefore, there are still many relevant perspectives on this matrix that remains to be explored. These include the dynamics of workshop games: if one game moves on the facilitation scale, can that change the outcome from mapping to innovation? How flexible and changeable are the connections between the parameters if the game foundation is strong? Another perspective that is interesting to explore is the realms of the matrix and whether dynamic visualization is the most fruitful type of visualization when discussing the level of relevant gamification, or instead whether it could be transformed into more fixed realms. This can be seen with Pine and Korn's [21] *multiverse*. The *multiverse* matrix is founded on three axes: *time, space,* and *matter.* The gamification matrix is also founded on three axes: *purpose, facilitation*, and *gamification.* Nevertheless, the multiverse [21] is transformed into eight realms, each of which represents a combination of three extremities from the three axes, representing realms from reality to virtuality. It would be interesting to explore whether the gamification matrix could define some more fixed realms, or whether it needs to be flexible to support the varying levels of gamification and facilitation.

Lastly, the game fidelity axes could also be explored in more depth by researching whether they can be more specific about when a workshop is gamification and when it is a game. Can the number of game mechanics be a factor in determining what needs to be present for a workshop to be one or the other?

6 Conclusion

There are many interesting and thorough examples of how to work with gamification and games in business, for either creating innovation or mapping [2, 4, 13–15]. Nevertheless, there is a tendency to overuse gamification, and it therefore loses coherence as a theoretical reference point [16]. Therefore, the purpose of creating this gamification matrix is to help avoid falling into "the dark side of gamification" while giving workshop designers a tool to discuss why it is relevant to apply game elements to the workshop, as well as at which level it is relevant to gamify a workshop. The matrix thus represents a framework that is relevant to discuss early in the workshop design process to ensure that we are not using gamification for the sake of using gamification, but rather to help us achieve the intended outcome. Thus, optimizing the potentials for creating an innovative development session, which can help to unlock creative processes and ideation at the right level. In this paper, we have presented the different levels of gamification fidelity in workshops, followed by a presentation of the parameters that are essential to discussing the balance of the level of gamification in a workshop, depending on the level of facilitation and the desired outcome, from mapping to innovation. These parameters were then transformed into a matrix for defining/creating gamified innovative processes, before we exemplified the use of the matrix through a use case and analysis of three workshop games. The matrix gives workshop designers a dynamic tool to visualize and discuss the relevant levels of gamification.

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