From Game Design Elements to Gamefulness: Defining Gamification

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From Game Design Elements to Gamefulness:
Defining "Gamification"

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ABSTRACT

Recent years have seen a rapid proliferation of mass-market consumer software that takes inspiration from video games. Usually summarized as "gamification", this trend connects to a sizeable body of existing concepts and research in human-computer interaction and game studies, such as serious games, pervasive games, alternate reality games, or playful design. However, it is not clear how "gamification" relates to these, whether it denotes a novel phenomenon, and how to define it. Thus, in this paper we investigate "gamification" and the historical origins of the term in relation to precursors and similar concepts. It is suggested that "gamified" applications provide insight into novel, *gameful* phenomena complementary to playful phenomena. Based on our research, we propose a definition of "gamification" as *the use of game design elements in non-game contexts*.

Categories and Subject Descriptors

H.5.m [**Information Interfaces and Presentation (e.g., HCI)**]: Miscellaneous; K.8.0 [**Personal Computing**]: Games; J.4 [**Social and Behavioral Sciences**]: Psychology, Sociology

General Terms

Design, Theory

Keywords

Alternate reality games, game-based technologies, gameful design, gamefulness, games, gamification, pervasive games, play, playful design, playfulness, serious games

1. INTRODUCTION

Following the success of the location-based service *Foursquare*, the idea of using game design elements in non-game contexts to motivate and increase user activity and retention has rapidly gained traction in interaction design and digital marketing. Under the moniker "gamification", this idea is spawning an intense public debate as well as numerous applications – ranging across productivity, finance, health, education, sustainability, as well as news and entertainment media. Several vendors now offer "gamification" as a software service layer of reward and reputation systems with points, badges, levels and leader boards.

This commercial deployment of 'gamified' applications to large audiences potentially promises new, interesting lines of inquiry and data sources for human-computer interaction (HCI) and game studies – and indeed, "gamification" is increasingly catching the attention of researchers [24,48,58].

However, until now, little academic attention has been paid to a definition of the concept of "gamification" (see [37] for one exception). There has also been no close scrutiny of whether the term actually denotes a sufficiently new and distinct phenomenon. Therefore, this paper surveys and situates current uses of "gamification" within existing research to suggest a definition of "gamification". The first sections describe the origin and current uses of the term and compare these with historic precursors and parallels in HCI and game studies. This leads on to a definition of "gamification" and a discussion of its elements. It is argued that "gamification" calls attention to phenomena of "gamefulness", which should be considered as complementary to but distinct from playfulness. The definition is situated in the fields of HCI and game studies, and the paper concludes by outlining the research contribution of studying "gamified" applications.

2. INDUSTRY ORIGINS

"Gamification" as a term originated in the digital media industry. The first documented use dates back to 2008 [54,55], but the term did not see widespread adoption before the second half of 2010. Parallel terms continue being used and new ones are still being introduced, such as "productivity games" [47], "surveillance entertainment" [32], "funware" [66], "playful design" [27], "behavioral games" [25], "game layer" [56] or "applied gaming" (natronbaxter.com). Yet "gamification" has arguably managed to institutionalize itself as the common household term.

Despite or because of that, "gamification" is also a heavily contested term, especially within the game industry and the game studies community. Discontent with current implementations, oversimplifications, and interpretations have led some to coin different terms for their own arguably highly related practice. For instance, designer and researcher Jane McGonigal redefined "Alternate Reality Games" as "a game you play in your real life" ([48], p. 120) to describe her work, and game scholar and designer Ian Bogost recommended replacing the term "gamification" with "exploitationware" [9] as an act of linguistic politics that would more truthfully portray the "villainous reign of abuse" that "gamification" presumably entails.

Current industry uses of the term fluctuate between two related concepts. The first is the increasing adoption, institutionalization

and ubiquity of (video) games in everyday life [63,35,18]. The second, more specific notion is that since video games are designed with the primary purpose of entertainment, and since they can demonstrably motivate users to engage with them with unparalleled intensity and duration, game elements should be able to make other, non-game products and services more enjoyable and engaging as well [71,73].

Vendors and consultants have tended to describe "gamification" practically and in terms of client benefits, for example as "the adoption of game technology and game design methods outside of the games industry" [35], "the process of using game thinking and game mechanics to solve problems and engage users" [70], or "integrating game dynamics into your site, service, community, content or campaign, in order to drive participation".[1]

3. PRECURSORS & PARALLELS

These ideas are not entirely new. The notion that user interface design can be informed by other design practices has a rich tradition in HCI. During the first boom of computer games in the early 1980s, Malone wrote seminal papers deriving "heuristics for designing enjoyable user interfaces" from video games [46]. Carroll [16] analyzed the design of early text adventures such as *Adventure*, leading him and Thomas [14] to suggest redressing routine work activities in varying "metaphoric cover stories" to make them more intrinsically interesting, and to urge for a research program on fun and its relation to ease of use [15].

With the expansion and maturation of the field and the rise of user experience as a profession, more researchers began to study such "hedonic attributes" [34] or "motivational affordances" [69] of "pleasurable products" [40], dubbing the field "'funology' – the science of enjoyable technology" [8], again taking game design as an important source of inspiration. As part of this movement, some researchers have looked into "games with a purpose", in which game play is piggybacked to solve human information tasks such as tagging images [2], and using game interfaces and controllers in other contexts [17]. More importantly, multiple researchers have explored *playfulness* as a desirable user experience or mode of interaction, and how to design for it. Despite this considerable body of research, no consensual theory or terminology of playfulness has emerged so far: Sometimes, it is equated broadly with any "pleasurable experience" [20] or "fun" [28], or indeed every interaction that goes beyond utilitarian work and task contexts [30,31,52]. To this end, Gaver introduced the terms "ludic design", "ludic engagement" and "ludic activities", broadly describing "activities motivated by curiosity, exploration, and reflection" [30]. Other studies focused and defined playfulness more narrowly [68,51,43]; Korhonen, Montola and Arrasvuori have made the most systematic attempt in this regard [43,44]. Combining the "pleasurable experience" framework of Costello and Edmonds [20] with further theoretical work and user studies on video game play, they developed a Playful Experience Framework (PLEX) that categorizes 22 (originally 20) playful experiences.

Finally, in the 2000s, HCI researchers also became increasingly interested in studying the design and experience of video games in their own right, developing methods to evaluate their user experience [6], "playability" heuristics for their design [62], and models for the components of games [29,36] and game experience [13,53,65].

In the field of game studies, "gamification" can be seen as but one further outgrowth of the repurposing and extension of games beyond entertainment in the private home.

Games used for serious purposes or "serious games" [1] date back several millennia [33], migrating from mainly military uses into education and business in the second half of the 20th century. In the early 2000s, the rise of digital games has reinvigorated this into a substantial industry and research field of its own. Such digital, serious games can be defined as "any form of interactive computer-based game software for one or multiple players to be used on any platform and that has been developed with the intention to be more than entertainment" ([59], p. 6). Within serious games, some authors have proposed differentiating between *serious games* and *serious gaming* [39]. Whereas the term "serious games" denotes games designed to convey learning material in being played through, "serious gaming" encompasses any (educational) utilization of the broader ecology of games – that is, all of the technologies, practices, literacies and social processes surrounding games, like reviewing games; producing machinima; or designing virtual items, avatars, levels, or whole games.

In parallel to the serious games movement, new game genres evolved that stretched the traditional limits of games, bringing games into new contexts, situations and spaces. These are commonly called *pervasive games*, games that have "one or more salient features that expand the contractual magic circle of play spatially, temporally, or socially" ([50], p. 12). Examples are location-based games that take gameplay into the public space, augmented reality games that use digital devices to overlay game representations over the environment, persistent games that continually run to be entered and exited during the course of the day, or alternate reality games which "take the substance of everyday life and weave it into narratives that layer additional meaning, depth, and interaction upon the real world" ([50], p. 37).

On the broadest scale, media scholars observe a "ludification of culture" [50,57]. With their increasing ubiquity, adoption and institutionalization in the past three decades, they argue that video games have become a cultural medium and source of formative experiences on a par with literature, movies, or television in earlier generations. Technologies, tropes, references and metaphors, mindsets and practices flowing from games increasingly suffuse society and everyday life, most notably playful identities and playful media practices.

4. TOWARDS A DEFINITION

This brief review shows that "gamification" has grown within a rich bed of interacting trends and traditions in interaction design and games, and that there are already a number of potentially competing, parallel, or overlapping concepts. Thus, if "gamification" is to be understood and developed as an academic term, the task is to determine whether the term and current "gamified" applications are significantly different from previous phenomena and areas of research – and if so, how to situate them in relation to these existing fields.

We believe that "gamification" does indeed demarcate a distinct but previously unspecified group of phenomena, namely the complex of gamefulness, gameful interaction, and gameful design, which are different from the more established concepts of playfulness, playful interaction, or design for playfulness. Based on this observation, we propose the following definition: "Gamification" is *the use of game design elements in non-game contexts*. The following sections unpack this definition in detail.

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[1] http://www.bunchball.com/nitro/

4.1 Game

Firstly, "gamification" relates to *games*, not *play* (or playfulness), where "play" can be conceived of as the broader, looser category, containing but different from "games" [60]. In game studies, this distinction between games and play is usually tied back to Caillois' concept of *paidia* and *ludus* as two poles of play activities [12]. Whereas *paidia* (or "playing") denotes a more free-form, expressive, improvisational, even "tumultuous" recombination of behaviors and meanings, *ludus* (or "gaming") captures playing structured by rules and competitive strife toward goals. Along those lines, classic definitions in game studies state that gaming and games – in contrast to playing and toys – are characterized by explicit rule systems and the competition or strife of actors in those systems towards discrete goals or outcomes [42,60]. Recent theoretical and empirical studies have provided further support for the distinctness of "playing" and "gaming" as two modes, foci, or "values" of behavior and mindset[2] encountered during video game play [4,41]. This distinction also appears in HCI research on playfulness. The aforementioned PLEX framework acknowledges Caillois' distinction of *paidia* and *ludus* in that it explicitly sets out to capture all experiences between these two poles [43]. Finally, academic as well as industry critiques of "gamified" applications have repeatedly emphasized that these focus almost exclusively on design elements for rule-bound, goal-oriented play (i.e., *ludus*), with little space for open, exploratory, free-form play (i.e., *paidia*) [3,23]. Indeed, this critique of mass-market "gamified" applications serves as a valuable observation from a research perspective: namely, that design inspired by games can afford experiences and behaviors leaning more to one pole of play than the other. These applications also provide us with empirical data on the design and experience of systems supporting the rule-bound or *ludus* pole, which has arguably received less research attention in HCI.

On these grounds, in contrast to the PLEX framework that includes both free-form and rule-bound play under "playfulness", we suggest adopting the term "gamefulness" recently introduced by McGonigal [48] as a systematic complement to "playfulness". Where "playfulness" broadly denotes the experiential and behavioral qualities of playing (*paidia*), "gamefulness" denotes the qualities of gaming (*ludus*). Thus, gamefulness circumscribes a coherent set of phenomena that is both distinct and has received little focused attention so far, which provides a meaningful extensional ground for defining "gamification". To systemize the terminology, one may distinguish

- *gamefulness* (the experiential and behavioral quality),
- *gameful interaction* (artifacts affording that quality), and
- *gameful design* (designing for gamefulness, typically by using game design elements).

In terms of defining "gamification", this means that it too has to be analytically distinguished from playfulness or playful design – indeed, this marks the novelty of "gamified" applications. In practice, it can be assumed that they often can and will give rise to playful behaviors and mindsets as well, just as video game players often switch between playful and gameful behaviors and mindsets during play [4]. "Gamification" will *usually* coincide with

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[2] There is some consensus that playfulness should be construed as an attitude or mindset with which one approaches a given activity, rather than a distinct set of observable behaviors. However, several scholars also point out that although that is the case, there are still certain observable formal properties of activities when they are playfully approached [11,22,45]. To capture this, we speak of "behavior *and* mindset" here.

gameful design as defined above: The most likely strategy of designing for gameful experiences is to use game design elements, and the most likely goal of using game design elements are gameful experiences. Yet analytically, gameful design and "gamification" frame the same extension of phenomena through different intensional properties – as the design *strategy* of using game design elements (gamification) or the design *goal* of designing for gamefulness (gameful design).

Although the overwhelming majority of current examples of "gamification" are digital, the term should not be limited to digital technology. Not only are media convergence and ubiquitous computing increasingly blurring the distinction between digital and non-digital: games and game design are themselves transmedial categories [42].

4.2 Element

Whereas "serious game" describes the design of *full-fledged* games for non-entertainment purposes, "gamified" applications merely incorporate *elements of* games (or game "atoms" [10]). Of course, the boundary between "game" and "artifact with game elements" can often be blurry – is *Foursquare* a game or a "gamified" application? To complicate matters, this boundary is empirical, subjective and social: Whether you and your friends 'play' or 'use' *Foursquare* depends on your (negotiated) focus, perceptions and enactments. The addition of one informal rule or shared goal by a group of users may turn a 'merely' "gamified" application into a 'full' game. Within game studies, there is an increasing acknowledgement that any definition of "games" has to go beyond properties of the game artifact to include these situated, socially constructed meanings [19,67]. For the present purpose, this means that (a) artifactual as well as social elements of games need to be considered, and (b) artifactual elements should be conceived more in terms of *affording* gameful interpretations and enactments, rather than *being* gameful. Indeed, the characteristic of "gamified" applications might be that compared to games, they afford a more fragile, unstable 'flicker' of experiences and enactments between playful, gameful, and other, more instrumental-functionalist modes.

This leads directly to another question: Which elements belong into the set of 'game elements'? Take the "Ten Ingredients of Great Games" identified by Reeves and Read [58]: Self-representation with avatars; three-dimensional environments; narrative context; feedback; reputations, ranks, and levels; marketplaces and economies; competition under rules that are explicit and enforced; teams; parallel communication systems that can be easily configured; time pressure. Each of these elements can be found outside of games, and taken in isolation, none of them would be readily identified as 'gameful', let alone game-specific. Also, there is serious variation between the different game genres and digital versus non-digital games – avatars are common in action and roleplaying games, but not necessarily in strategy video games or card games. In addition, how game elements are perceived can also be a matter of role, whether this be designer or user. For example, the MDA model [36] suggests that designers work with mechanics to create aesthetics, whereas players experience aesthetics, and in so doing, infer knowledge about mechanics.

This points to the fact that "game" is a composite category of multiple necessary conditions. Take the "classic game model" by Juul [42]: "A game is a rule-based formal system with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the

outcome, the player feels attached to the outcome, and the consequences of the activity are optional and negotiable." As Juul himself argues, no part of this definition on its own constitutes a game. Only together do they set apart a clear figure against the background of other phenomena.

Yet as helpful as this may be for defining games, it does not answer the question of how to identify game *elements*. One solution is to treat game elements as a set of building blocks or features shared by games (rather than a set of necessary conditions for a game), comparable to Wittgensteinian family resemblances. A very strict interpretation of this approach – accepting only elements that are unique or *specific* to games – would produce an empty or very constrained set. A very liberal interpretation – any element that can be found in any game – would be boundless. We therefore suggest restricting "gamification" to the description of elements that are *characteristic* to games – elements that are found in most (but not necessarily all) games, readily associated with games, and found to play a significant role in gameplay. Of course, this is a heuristic definition with much room for debate over what is "characteristic" for games.

4.3 Design

As noted, "gamified" applications are not the only instances where *elements* of games have been repurposed. In HCI, there is a long tradition of using game controllers as input devices for other purposes. Graphic engines and authoring tools of video games are also regularly used for non-entertainment purposes (from scientific visualizations and 3D environments to fan art), as are practices of the broader game ecology, e.g. in serious gaming. For the purposes of terminological and conceptual clarity, it is more helpful to reserve the term "gamification" for the use of game *design*, not game-based technologies or practices of the wider game ecology.

When surveying the existing literature on games and "gamification", we found that such game design elements were identified on varying levels of abstraction. All of these levels should be included in the definition. Ordered from concrete to abstract, five levels can be distinguished (tab. 1): Interface design patterns [21]; game design patterns [7] or game mechanics [67]; design principles, heuristics or 'lenses' [62]; conceptual models of game design units [10,13,29,36]; game design methods and design processes [5,29].

As can be seen, this 'level model' distinguishes interface design patterns from game design patterns or game mechanics. Although they relate to the shared concept of pattern languages [26], unlike interface design patterns, neither game mechanics nor game design patterns refer to (prototypical) implemented solutions; both can be implemented with many different interface elements. Therefore, they are more abstract and thus treated as distinct.

So to restate, whereas serious games fulfill all necessary and sufficient conditions for being a game, "gamified" applications merely use several design elements from games. Seen from the perspective of the designer, what distinguishes "gamification" from 'regular' entertainment games and serious games is that they are built with the intention of a system that includes *elements* from games, not a full 'game proper'. From the user perspective, such systems entailing design elements from games can then be enacted and experienced as 'games proper', gameful, playful, or otherwise – this instability or openness is what sets them apart from 'games proper' for users.

Table 1. Levels of Game Design Elements

Level	Description	Example
Game interface design patterns	Common, successful interaction design components and design solutions for a known problem in a context, including prototypical implementations	Badge, leaderboard, level
Game design patterns and mechanics	Commonly reoccurring parts of the design of a game that concern gameplay	Time constraint, limited resources, turns
Game design principles and heuristics	Evaluative guidelines to approach a design problem or analyze a given design solution	Enduring play, clear goals, variety of game styles
Game models	Conceptual models of the components of games or game experience	MDA; challenge, fantasy, curiosity; game design atoms; CEGE
Game design methods	Game design-specific practices and processes	Playtesting, playcentric design, value conscious game design

4.4 Non-game contexts

Similar to serious games, "gamification" uses elements of games for purposes other than their normal expected use as part of an entertainment game. Now 'normal use' is a socially, historically and culturally contingent category. However, it is reasonable to assume that entertainment currently constitutes the prevalent expected use of games. Likewise, joy of use, engagement, or more generally speaking, improvement of the user experience represent the currently predominant use cases of "gamification" (in the definition proposed in this paper, gameful experiences are the most likely design goal). Still, we explicitly suggest *not* delimiting "gamification" to specific usage contexts, purposes, or scenarios. Firstly, there are no clear advantages in doing so. Secondly, the murkiness of the discourse on "serious games" can be directly linked to the fact that some authors initially tied the term to the specific context and goal of education and learning, whereas serious games proliferated into all kinds of contexts [61]. Thus, in parallel to Sawyer's taxonomy of serious games [61], we consider different usage contexts or purposes as potential subcategories: Just as there are training games, health games, or newsgames, there can be gameful design or "gamification" for training, for health, for news, and for other application areas.

Some authors have argued that games themselves can be 'gamified' [72], a case in point being meta-game platforms such as achievement systems [38,49]. In principle, this might be in line with the definition presented here – the only thing that "non-gaming contexts" *explicitly* intend to exclude is the use of game design elements *as part of designing a game*, since that would simply be game design, not "gamification". However, on closer scrutiny, classifying meta-games or other additions of game design to existing games as something other than game design becomes hard to uphold: Firstly, even in formalist game literature, meta-games are also understood as full-fledged games, "based on the effects and outcomes of other games" ([7], p. 401), not simply game design *elements*. Secondly, from the designer's perspective, given that the context of design is already that of games, it seems counter-productive to perceive the design of meta-games (or game elements) as distinct from the design of those games. Thirdly, shifting our focus to the user's perspective, it is a complex and open empirical question whether (or under what circumstances) players experience meta-game elements as part of or distinct from the "primary game". And in all cases where a meta-game system

is not experienced as distinct from the "primary" game, it appears unnecessary to create an artificial separation between the two. Finally, we have argued that part of the novelty and distinctness of "gamified" systems is the experiential 'flicker' between gameful, playful, and other modes of experience and engagement. Such flickers are arguably less likely to occur when the user is already playing a game. Classifying meta-games as "gamification" does not acknowledge this difference, but we readily admit that this constitutes a complex case that warrants further empirical research.

5. SITUATING "GAMIFICATION"

To summarize: "Gamification" refers to
- *the use* (rather than the extension) *of*
- *design* (rather than game-based technology or other game-related practices)
- *elements* (rather than full-fledged games)
- *characteristic for games* (rather than play or playfulness)
- *in non-game contexts* (regardless of specific usage intentions, contexts, or media of implementation).

This definition contrasts "gamification" against other related concepts via the two dimensions of playing/gaming and parts/whole. Both games and serious games can be differentiated from "gamification" through the parts/whole dimension. Playful design and toys can be differentiated through the playing/gaming dimension (Figure 1). In the broader scheme of trends and concepts identified as related, we find "gamification" or gameful design situated as follows: Within the socio-cultural trend of ludification, there are at least three trajectories relating to video games and HCI: the extension of games (pervasive games), the use of games in non-game contexts, and playful interaction. The use of games in non-game contexts falls into full-fledged games (serious games) and game elements, which can be further differentiated into game technology, game practices, and game design. The latter refers to "gamification" (Figure 2).
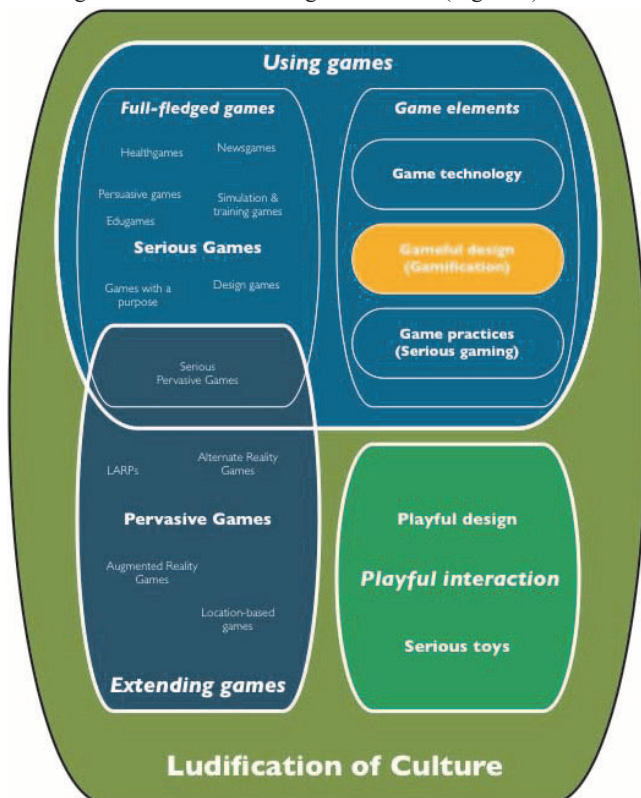

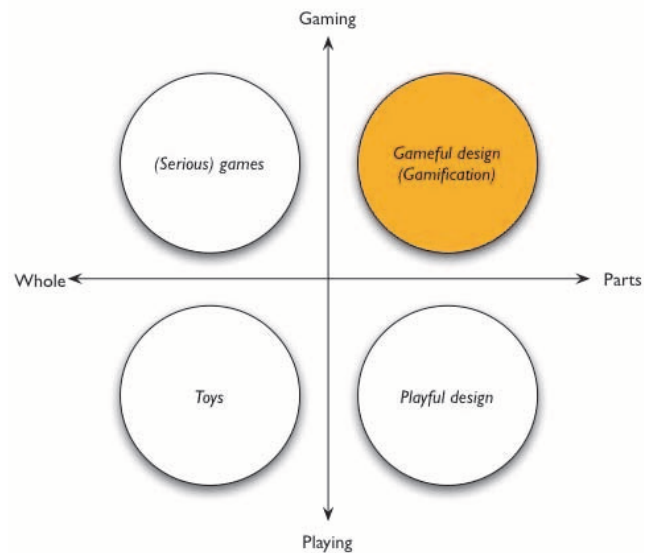Figure 2. Situating "gamification" in the larger field

Figure 1. "Gamification" between game and play, whole and parts

To date, there appears to have been only one alternative attempt to define "gamification" in academic literature. Huotari and Hamari have suggested defining "gamification" from a service-marketing perspective as a "service packaging where a core service is enhanced by a rules-based service system that provides feedback and interaction mechanisms to the user with an aim to facilitate and support the users' overall value creation." [37]

Huotari and Hamari's definition differs from our own in several ways. Firstly, by focusing on rules-based systems, it arguably covers more than games or 'gamified' services and is ultimately applicable to almost any interactive system. Even a touchpad for ordering snacks in a cinema would qualify as a "rules-based service system" (driven by software) "that provides feedback and interaction mechanisms" (people order through the interface, which confirms their orders) "with an aim to facilitate and support the users' overall value creation" (the ability to order snacks enhances the movie experience).

Secondly, focusing on rules-based systems and situating the definition within a service marketing perspective underplay the constitutive social and experiential dimensions of games.

Thirdly, the definition excludes all systems where the provision of game mechanics (tailored to a specific context) is *the core service itself*, or at least an *essential* part of it: What most 'gamified' health applications such as *Health Month* (healthmonth.com) offer is the ability to set up rules and goals for personal health behavior, to then track actual behavior against them – these game elements are not a deductable "enhancement" of another "core" service. In contrast, we believe that our definition addresses all these issues.

6. CONCLUSION

This paper argued that current "gamified" applications present emerging phenomena that warrant new concepts and research. Specifically, it suggested that insight into "gamefulness" as a complement to "playfulness" – in terms of design goals as well as user behaviors and experiences – marks a valuable and lasting contribution of studying "gamified" systems. Partly in reaction to this, the term "gameful design" – design for gameful experiences – was also introduced as a potential alternative to "gamification". Given the industry origins, charged connotations and debates

about the practice and design of "gamification", "gameful design" currently provides a new term with less baggage, and therefore a preferable term for academic discourse.

Another important point is the high level of subjectivity and contextuality in identifying "gamification". It is not possible to determine whether a given empirical system 'is' "a gamified application" or "a game" without taking recourse to either the designers' intentions or the user experiences and enactments. Indeed, in comparison to games on the one hand and utility software on the other, a distinct quality of "gamified" applications is their relative openness to varying situational modes of engagement – gameful, playful, and instrumental.

To conclude, one of the big promises of today's commercial deployments of "gamified" systems is easy access to more ecologically valid user data on the different kinds of experiences and natural categories that arise from interaction with these systems. This data will ultimately determine the validity of the distinctions introduced here. Even if they do not remain upheld in the long term, we believe that our suggested definitions of "gamification" and "gamefulness" against serious games and playful interaction clarifies discourse and thus allows research to move into more detailed study, and clearer conceptualization of the defined phenomena.

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