A Preliminary Taxonomy of Gamification Elements for Varying Anticipated Commitment

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Abstract
We present a preliminary taxonomy of gamification elements for designing ways to engage users of a computer-based service, given different levels of expected engagement and willingness to commit time to interaction.

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Gamification elements, taxonomy

ACM Classification Keywords
H.5.m. Information interfaces and presentation (e.g. HCI): Miscellaneous.

Introduction
A benefits portal is a website where employees can access health plan offerings, 401K, career guidance and so on. But employees do not always use the benefits they are entitled to, to best advantage. In a preliminary interview study of 13 informants, we discovered that interviewees cared about the issues their benefits tackle, but were unfamiliar with their portal and its offerings. When they were asked to walk through their benefits portal, they always had trouble finding it, remembering login information and finding services, demonstrating a historical lack of engagement and commitment to its use. This resonates with findings from a recent online survey [1] which found that employees made poor choices at benefits enrollment and were "on autopilot" when making their selections.

To help improve matters, we plan to use gamification, as defined in [3]. We seek to address the needs of people who are necessarily committed to engaging with our content for more than a few seconds and to draw them into higher levels of interest, more frequent and extensive exploration and more and better use of their benefits resources.

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Element	Code	Rationale
General Framing		
Context	L	Context is always salient for whether someone is likely to invest time and effort.
Background	M/H	Time taken to absorb background may be too high to bother in low commitment context.
Narrative	M/H	See above.
General Rules and Performance Framing		
Guidance	L/M	Lightweight guidance can be carefully designed.
Internal Objectives	L	Simple objective / target can be explained by an image or short sentence.
Ambiguous Path to Objective	M/H	Puzzles need some commitment to be effective. Good puzzles may require a lot of engagement.
Renewal/ Regeneration	M	Requires some commitment to return. Wouldn't work for one-off or rare visits.
Set for Completion	L	Even a small set can be effective, so OK for low commitment.
Notable Records of Achievements	L	Easy to read things like "High Score=1035" so OK for low commitment settings.
Social Features		
Relationships	L/M	Usually requires higher commitment. Possible to apply with preexisting social vectors.
Interaction Modes	L/M	See above.
Visibility/ Accountability	L/M	See above.
Social Performance	L/M	See above.

Table 1. Taxonomy of Gamification Elements coded for Low (L), Medium (H), High (H) or Variable (V) *minimal commitment* requirements, based on the rationales.

Preliminary research did not uncover a straightforward summary of characteristic (as defined by [3]) gamification mechanics elements that are suitable for low-commitment (seconds) as opposed to medium- (minutes) or high-commitment (hours; MMOGs may entail up to 20 hours or more of play per week [12]). Our contribution in this paper, therefore, is to propose a basic taxonomy of common gamification elements in a framework that suggests the degree to which each element is likely to be exploitable at different levels of anticipated user commitment. We present this as an artifact for refinement through discussion and further research, rather than as a conclusive summary of the usefulness of gamification mechanics in different commitment contexts.

Related Work

There do exist articles that provide systematic accounts or frameworks that are helpful, but not exactly what we were looking for. Hunicke et al [6] present a Mechanics, Dynamics, and Aesthetics framework, which is designed to assist designers of games in understanding how to create an engaging experience by typing mechanics to the dynamics that afford the appropriate aesthetics for the game. However the mechanics are not itemized and classified. Yee [13] offers a framework for game play motivation, based on a factor analysis of a large survey of player motivations. However, this does not extend to the gamification features that satisfy the motivations. Deterding et al [3] provide a sophisticated definition of gamification, which places gamification elements in a model of multiple levels of design abstraction, but their objective is not to provide concrete examples of gamification elements themselves. Dignan [4] presents a 'game frame,' which is a conceptual framework or template comprising ten building blocks which he argues make up a "behavioral game" (a gamified activity) and presents specific examples of "building blocks" of gamified experiences, which are exactly what we seek, but not organized concisely nor within an taxonomic structure with guidance on what level of commitment they are best suited to. Huotari and Hamari [7] provide a definition of gamification from a service marketing perspective, in other words explaining how gamification can be applied to enhance the perceived value of a service to a user and provide some good examples of gamification elements, but not a systematic collection.

Whilst providing helpful reference material, these works do not provide a concise, timesaving but reasonably comprehensive presentation of common gamification elements in terms of the various aspects of the user experience that they support. Nor do they differentiate the value of different types of element with respect to the level of user commitment required. In response we have drawn from these and other works and surveyed online resources such as the gamification wiki [5], relevant articles such as [8,9,10,11] to inform a simple taxonomy of gamification mechanism features that can be explicitly designed into or fostered by an experience. The lead author has also drawn upon 7 years of making and analyzing games and experiencing the success of their gamification elements. The taxonomy comprehensively covers all of the elements mentioned in works we have reviewed thus far and some additional ones based on the first author's experience as a game-design, development and analytics consultant. *Note that although all of these elements can be chosen, designed or be designed for, some, such as entertainment, may correspond to phenomena that can also occur without any explicit design intent*.

Element	Code	Rationale
Intrinsic Incentives		
Curiosity	L	Curiosity can be triggered quickly and leads to higher engagement/commitment.
Challenge	L	Simple challenges can be effective even in a low commitment setting.
Entertainment	L	Simple elements can work very quickly in low commitment settings.
Social Reward / Peer Pressure	V	In low commitment setting you depend on the context to create a social vector.
Personal Returns	V	Without context, significant explaining may be necessary for some returns.
Societal Returns	V	See above.
Extrinsic Incentives		
Deals / Discounts	L	Easily understood. Can be designed with complete control.
Financial	L	See above.
Goods / Services	L	See above.
Time	L	See above.
Lottery / Draw / Bet	L	See above.
Virtual Currency / Goods	H	Only works if user is committed enough to use it.
Virtual Abilities	H	See above.
Add to Record of Achievements	M	Can work as long as the user can be made to value personal or public record.
Validation	M	See above.

Table 1 Continued

Also note that some of these mechanics, at least defined abstractly as they are here, are more frequently used without the intention to gamify but are nonetheless very useful as gamification elements.

We sum up the main categories of the taxonomy in the following sections but a more comprehensive breakout of the individual items is provided in Table 1, where each is coded for the minimum user time commitment required for it to work. Even more detailed distinctions and explanation can be found in the Appendix to this paper. Unfortunately it is too large to compress into an extended abstract format.

We were able to establish six major categories of gamification element, which may be *designed into* the experience, *designed for* in the experience, or which may *provide context for* an experience. All of the gamification elements that we were able to identify from related work or from articles online were able to be placed into the following set of top level categories at a first subcategory or second subcategory level.

- **General Framing:** Provides context and motivation for participation, for example, who is offering the gamified content and why, such as a good cause, or to generate revenue. May provide a real or fantasy back-story and other information.
- **General Rules and Performance Framing:** Explains in general what is expected such as operating an avatar in combat or scoring as high as possible on a test of health knowledge. In so doing, this orients the user towards what constitutes 'good' performance in the gamified context.
- **Social Features:** Permit the user to interact with others, at the very least outside the experience (perhaps to compare experiences), but often within the gamified experience itself.
- **Incentives:** These may be intrinsic (such as experiencing flow [2], extrinsic and, practical, material or, in the case of extrinsic incentives, purely virtual, having value only to players.
- **Resources and Constraints:** Are the bounds within which the user must operate to participate.
- **Feedback and Status Information:** Allow the user to understand what is going on, what they must do next, what they have done recently and perhaps over the entire course of their engagement. Gamification elements may also provide information about the actions of others.

In order to determine the appropriate level of minimal commitment for each category we need to dig deeper into the taxonomy. Table 1 shows the taxonomy in terms of the *minimum* level of engagement required for gamification elements (defined at the first subcategory level) to be effective; High=H, Medium=M, Low=L and Various=V; "Various" means depending on the specifics of the sub-sub category, which space precludes us from exploring in this extended abstract (but see Appendix for an overview of sub-sub category items and definitions of all items).

As mentioned, this taxonomy draws upon personal professional experience of game design and evaluation as well as existing academic literature, trade articles and other publications by game-design experts, it therefore condenses a lot of experience into one succinct summary. However, we believe its value would be much enhanced by the inclusion of scientific studies of these mechanics and their effectiveness and

Element	Code	Rationale
Resources and Constraints		
Available Game Accomplish-ments	L	All gameful experiences require something to do or accomplish.
Control Repertoire	L	All gameful experiences involve a means to control actions.
Choice Architecture	L	Easy to implement even in the simplest experience.
Specific Rules	L	Gamified experiences all require specific rules, otherwise they are just play.
Scarcity of Resources	L/M	Perhaps possible to design into low commitment games.
Temporal Aspects	L	Time-based elements are easily incorporated in low commitment settings.
Perceptual Aspects	L	Any gamified experience requires perceptual elements even if only sound
Topological Aspects	L/M	Possible but difficult to design good topological elements for low commitment situations.
Ability, Difficulty and Advanceme-nt	M	Requires commitment to confer a sense of increasing ability.
Change / Novelty	M	Difficult to design novel experiences in low commitment experiences.
Feedback and Status Information		
Graphical Indicators	L	Easy to design, and in fact critical for all gamification.
Audio Signals	L	Easy to design and often helpful for gamification.
Records of Achievement s	L	Easy to design and possibly essential in gamification.
Updated Context	L	Simple context devices can be used even in low commitment settings.

Table 1 Continued

examples of games where each element has been used, ideally with success (in place of the simple rationales, based on practical experience and overview articles, as cited here). This might be an outcome of collaborative effort at a workshop or obtained through an extensive literature survey for a journal article.

We believe that further refinement and extensions, based upon past and future studies, could make this a highly useful resource for those who wish to design gamified experiences. The reason for this is that in our experience such individuals are often not game designers and lack the expertise to know what gamification elements there are to choose from and to judge accurately which might work best for their particular context and expected level of user commitment.

Further useful elaboration of this taxonomy might also address appropriateness of gamification elements in terms of other dimensions, apart from the user commitment required, such as application domain (e.g., dull tasks, wellness, education, commerce) and platform (e.g., desktop, mobile, tablet, web).

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Appendix: Framework Details

The taxonomy in our framework consists of three tiers of categories of more or less purely gamification elements (i.e., some often can be found in other kinds of user experiences, but we argue these are still useful to include as types of gamification elements) that may or may not work well in low-commitment contexts. Definitions are provided in this appendix and Table 1 maps each top-tier and middle-tier item to minimal user time commitment requirements (L=seconds/low, M=minutes/medium or H=hours/high) for it to have a chance of being effective.

Note that our lowest level elements are still category abstractions not members. Consequently, the fact that members of the category can be gaming elements, rather than other types of user experience, may not be fully clear. For this reason, concrete examples of the gamification elements they refer to are usually given.

General Framing

Provides motivation for participation:

- **Context**: arguably not designed but chosen, e.g. setting such as workplace or SNS, dot com service
- **Background** provides objectives and motivational information such as education about a topic of interest and persuasive argumentation for 'playing'
- **Narrative**: information that sets the scene, e.g. "You're stranded on a desert island …"

General Rules and Performance Framing

Orients action, explains how to achieve the objectives or how to evaluate one's own performance:

- **Guidance**: instructions, explanations for how to use feature or play; e.g. "find the lost magic scroll"
- **Internal Objectives/targets:**
  - **Correct answers:** e.g. "Which of these is the odd one out?" "Which animal runs fastest?
  - **Choices**: e.g. pick subject matter for quiz, forks in roads, fight or flight
  - **Task executions**: e.g. fill in the blanks, find the treasure, go through the maze, fight the monster.
  - **Missions or quests:** complex task or series of tasks framed by a narrative
  - **Beat other players**
- **Non-obvious but discoverable means to accomplish objectives/targets**: e.g. puzzles, mazes, mysteries, riddles, clues, locks
- **Renewal/regeneration**: the chance to play again, given many failed attempts end in "death"
- **Template/set for completion**: e.g. "your profile is only 35% complete," or "answer all the questions"
- **Normative or "best" records of achievements**: e.g. average score [157], high score [10964]

Social Features

- **Relationships**
  - **Bonds**: e.g. partner, friend, contact
  - **Teaming**: e.g. guild in WoW, company weight loss team (typically cooperating)
  - **Cohorts**: e.g. class or race in WoW mainly sharing characteristics but may foster teaming or bonding
- **Interaction Modes**
  - **Communication & interaction channels**
  - **Commerce**; ability to trade with, sell to and/or buy from other players
  - **Gift giving**
  - **Commendations, voting**: e.g. "Like," props, connect, follow
  - **Collaboration/helping**: acting together or on one another offers performance benefit: e.g. form a team, or "heal" another
  - **Competition/rivalry/conflict**; acting against opponents or adversaries offers performance benefit: e.g. be first, "steal," "kill"
- **Visibility/accountability/reputation:** e.g. of profile or records of achievement or leaderboard
- **Information affording performance comparisons**: e.g. scores, ranking with friends, other players or with norms

Incentives

- **Intrinsic**: psychologically motivated anticipated real world outcomes, e.g.:
  - **Curiosity**: e.g. what is hidden behind the door?
  - **Challenge oneself/experience flow [2]**: e.g. can I match this score?
  - **Entertainment** (escapism, absorption)
  - **Social reward/peer pressure**: e.g. status, membership, connection, intimacy, relationship building, avoidance of negative social consequence
  - **Personal returns from gamified behaviors**: e.g. wealth, health, longevity, achievements, avoidance of negative personal consequence
  - **Societal returns from gamified behaviors**: e.g. save the environment, educate politicians
- **Extrinsic**: awarded by some entity such as game maker. Generally tied to intrinsic motivations e.g.:
  - **Material/Practical:**
    - **Deals or discounts:** similar to loyalty program
    - **Financial**: e.g. cash prize, voucher
    - **Goods/services**: e.g. tote bag, free massage
    - **Time**: time saved, vacation or time off; could be in day chunks or hour or minute chunks
    - **Lottery/draw/bet** for any of the above: as opposed to earning points to attain them
  - **Virtual:**
    - **Currency**
    - **Resources/property: Virtual Goods**
    - **Powers or abilities:** Increasing as the player progresses
    - **Add to record of achievements:** See below
    - **Validation:** Marks of approval from others, especially with visibility to others

Resources and Constraints

- **Available game accomplishments:** e.g. score, learn, find, collect, create, grow, combine, etc.
  - **Locomotion**: A special type of action that changes surrounding in-game context, e.g. move piece, rotate, turn, block, "fly," "ride"
- **Control repertoire:** e.g. click to cast die, select radio button, press arrow key, speak, gesture
- **Choice architecture:** brings together other gamification elements to structure available options at any given point for user/player to choose to make progress
- **Specific Rules**: required actions to accomplish objectives, e.g. turns, forbidden actions, penalties, handicaps **Randomness**: unpredictability adds interest
- **Scarcity of resources:** e.g. limited power or seeds
- **Temporal aspects** can add excitement or draw user back: e.g. withering of crops in Farmville or a countdown in many games
- **Perceptual**: e.g. views, concealment, text, hearing, feel; such as via joystick or vibration
- **Topological**: e.g. containers, openings, barriers, locks, paths, mazes, borders, different servers
- **Capability, difficulty and advancement**: over time, play and achievement changes settings of any of the above to maintain engagement and flow [2]
- **Change/Novelty**; new components or alterations are added over time to avoid stale experience

Feedback and Status Information

- **Graphical indicators**: e.g. to precisely reinforce a correct action or alert user to failure, sometimes called click-zen
- **Audio signals**: on their own or adding salience to the visuals
- **Records of Achievements:**
  - **Historical information**: e.g. checklist, performance gauge
  - **Progress** towards objective: e.g. 14/20 questions answered, 67% complete
  - **Badges or trophies**: e.g. scout badges
  - **Points, scores or ratings**: e.g. Space Invaders highest scorer
  - **Levels or grades**
- **Updated Context:**
  - **Resource indicator**: e.g. time left or dwindling power
  - **Indications of upcoming action, opportunities, challenges or threats**: e.g. approaching object, "daybreak," "nightfall"