

Understanding Digital Badges through Feedback, Reward, and Narrative: A Multidisciplinary Approach to Building Better Badges in Social Environments

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ABSTRACT

Digital badges are studied and implemented for a variety of purposes. Regardless of the specific application, all badges have one thing in common: they contain explicitly designed information meant to motivate users. This information is created by the badge's developer, transferred using the badge as a vessel, and assimilated by the user. In other words, badges are devices for communication. This article examines this communication process within social environments from three different perspectives—badges as rewards, feedback mechanisms, and narrative. For each of these perspectives, this article provides examples and discusses the type of information that can be communicated as well as the design considerations required for successful communication.

Categories and Subject Descriptors

H.0 Information Systems: General

General Terms

Measurement, Performance, Design, Experimentation

Keywords

Digital badging, Education, Learning, Motivation, Goal setting, Credentials, Assessment, Experimental design, Research design

INTRODUCTION

Digital badging systems are an emerging area of interest within the academic literature (Grant & Shawgo, 2013), and include both longstanding systems (e.g., Microsoft's Xbox Achievements) and newer initiatives (e.g., Codecademy's online achievement system). In a book about badging written for young learners, a digital badge is described as "an online image that tells people about a new skill that you've learned" (Masura, 2014, p. 9). This definition works well enough for adults, too, but there are some complex information design principles buried within this simple operational definition. For instance, due to their integration of psychology, design, and communication strategies, badges are intriguing from the perspective of user interface design (UID), information architecture (IA), and experience architecture (XA).

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We can use specific strategies from these fields to consider badges as designed systems that lead audiences to and through information in particular ways.

For example, Morville and Rosenfeld (2002) have discussed the importance of labeling, organization, navigation, and searching within the context of online information systems. We can similarly consider these categories for the analysis of badges in terms of both design and functionality. Labeling relates to the captioning or layering of textual information to badges; organization relates to how the badges are grouped and deployed (e.g., individual versus tiered); navigation can be used to think about the order in which badges appear in a system; and searching can be applied to the visibility of badges and the strategies used by online audiences to discover and earn new badges. These strategies illustrate the complexity of designing effective badges within social systems; while they can seem simplistic, they actually involve a series of complex decisions about anticipated users and audiences, ideal interfaces and environments, and appropriate design.

Due to this complexity, a more nuanced approach to understanding badges within specific informational contexts is needed. This more nuanced approach also suggests different strategies with which to conceptualize and understand the function of badges in information systems. In this paper, we consider three specific paradigms through which to analyze digital badges within social environments: feedback, reward, and narrative. Through these three perspectives, we pay particular attention to badges' limitations, their social connections, and the resulting design and user testing considerations required for effective deployment of digital badges.

THREE PERSPECTIVES ON BADGING

As designed objects within technological systems, digital badges impact users' experiences within that system. For example, depending on their verbiage, imagery, and specific completion logic, badges can transmit complex information in the form of rewards, feedback, or narrative. As a result, they rely heavily on the complex interactions among information architecture, user experience, and usability.

Badges as Rewards

Badges are frequently considered for their roles as extrinsic reward systems (Blair, 2012), a designation that can cause concern due to the negative stigma associated with rewards and an overall push toward gamification (Deterding, Dixon, Khaled, & Nacke, 2011; Anderson, 2011). In this role, badges are used to

encourage users to enact certain behaviors or meet particular goals. However, researchers have hypothesized that extrinsic rewards can be perceived as controllers of behavior, reducing the sense of autonomy necessary to foster intrinsic motivation—the motivation to complete a task for the sake of completing the task (Ryan, 1982; Deci, Koestner, & Ryan, 1999).

The negative effects of reward, however, have not consistently appeared during experimentation (Cameron & Pierce, 1994). Over time, the literature has isolated the conditions necessary for these negative effects, finding that they only seem to occur under very specific circumstances. A meta-analysis that examined 96 studies found that rewards only produced negative effects when the rewards were expected, tangible, and provided for mere completion of a task (Cameron & Pierce, 1994).

If these conditions are avoided, and badges are embedded effectively within technological systems and respond to the needs and desires of the participants in that community, rewards-based badges can be successful. As previously stated, badges should not be expected or given solely for task completion. To make badges unexpected, the criteria for earning each badge should not be displayed to the user until it has been awarded. Earning the badge is then a surprise for the user because they could not have foreshadowed its award—they did not know of its existence. When the criteria are known, users may then engage in active directed badge seeking with the goal of obtaining the badge. The task is no longer being completed to improve the self; the task is being completed to get the badge. The badge is then awarded, as expected, and the learner may continue to see which other badges they can earn.

Conversely, when the criteria are unknown, this sort of active directed seeking is not possible. The user engages in tasks for their intrinsic benefits, and may or may not be awarded for something along the way. When users participate in activities seen as intrinsically rewarding, they may enter a state of flow (Csikszentmihalyi, 1975) where they become fully immersed in the activity or task at hand; the goals and feedback structures, such as badges, in game environments can influence the possibility of flow for users (Nakamura & Csikszentmihalyi, 2002). Metaphorically, with expected badges, the reward is the ice cream we paid good money to get. With unexpected badges, the reward is a second cherry on top.

Aside from being unexpected, badges should also be awarded for reasons that extend beyond task completion. In most situations, an intrinsic reason already exists for completing a task; it is needed for career training, learning to use a system, understanding a concept, connecting to peers, or self-improvement. Providing badges for completion rewards a user for tasks that hold their own intrinsic rewards. It is unnecessary. Moreover, the overjustification effect (Lepper, Greene, & Nisbett, 1973) becomes a concern. This effect describes the tendency for users to retroactively re-assign justification to a task. In these scenarios, intrinsic motivation tends to be undervalued and the extrinsic reward may instead be re-assigned as the primary justification. With respect to badges, the user may perceive that he or she was completing the task to earn the badge instead of the original intrinsic reason. As a result, the user is less likely to perform the task in the future if the badge is not present; users might question why they should perform a task when the reason for doing it in the past is no longer present.

Instead, when a task is already intrinsically justified, badges may be useful to create justification for completing a task to an exceptional

degree. While completion of a task is often intrinsically justified, the intrinsic value may not be high enough to encourage users to exert high or sustained levels of effort. In this case, embedding badges within a larger social network of users may help prompt participants to contribute in exchange for external recognition from that network. Consider an Internet forum for exchanging information on software development. A user interested in the topic or engaged in the forum community will probably make 100 posts if he or she continues to visit the forum over time. Now, perhaps this forum has only a few highly knowledgeable users and a large population of users who are new to software development. The forum administrators may want to encourage these expert users to share their knowledge with the novice members. While making 100 posts may be somewhat guaranteed, expert users may be looking to expand their own knowledge and thus prioritize communication with other expert users. However, if the forum administrators implemented a peer rating system on posts, and then used badges to reward users that make “100 posts that users have rated helpful,” exceptionality is rewarded without sacrificing the intrinsic reasons for posting in general.

Nike’s Nike+ app provides another example of effective socially embedded badges. This app showcases user design capitalizing on reputation, group identification, and individual user status within a larger system (Antin & Churchill, 2011). The Nike+ Challenge feature allows users to challenge friends who also use the app to a race, awarding a gold medal to the winner (and other players receiving a white medal). In digital badging systems like Nike+, users tap into social networks to challenge themselves alongside others; as a result, such badging systems with socially embedded elements may reinforce new patterns of behavior (e.g., running daily or weekly) as well as modify habitual behaviors (e.g., challenge a runner to go faster or further) (Blohm & Leimeister, 2013). This is only one example of a socially embedded digital badging system that effectively brings together task completion, visible rewards, and group identification. As Gibson, Ostashevski, Flintoff, Grant, and Knight (2013) argued in their analysis of digital badging systems in social networks, these tools can motivate learners to engage with online materials and activities, achieve status and recognition within their network of peers, and offer visual representations of achievements that can be shared easily with others in the network and beyond.

Badges as Feedback

While badges are frequently used as reward systems, they can serve other purposes (Abramovich, Schunn, & Higashi, 2013), like providing feedback. Feedback is information that is provided to a learner, meant to enhance their understanding of their performance or comprehension (Hattie & Timperley, 2007). Information is probably the most critical word in that definition. While rewards communicate bits of information (e.g., “good job”), feedback transcends these boundaries by increasing the complexity of the information. It becomes more than affirmation; it is also constructive. While the word reward retains a negative stigma, the word feedback has a more positive connotation. Its strong positive benefits in the learning process when properly implemented (Hattie & Timperley, 2007) are well known. For example, Kluger and DeNisi (1996) found that feedback is most effective when elaborating upon feedback from earlier trials, addressing performance since that time, and when it is given with a specific focus on recognizing correct responses.

Badges that are designed to provide feedback should consider this information. While merely awarding a badge in response to positive behavior can be compared to a pat on the back for a job well done, feedback can be given through careful design of the completion logic or through a badge's accompanying description. For example, incremental badges are a series of badges awarded for demonstrating increasing levels of mastery on a particular task (Blair, 2012). When incremental badges are used, the learner is continuously told when he or she is making progress. These badges are similar to a hot-or-cold game that only tells the player when she is getting warmer. Badges are awarded as the learner moves closer to the goal, signaling improvement since the last badge has been awarded and building upon earlier feedback.

We also know that goals should be specific and moderately difficult in order to foster intrinsic motivation (Locke & Latham, 2002). Incremental achievements are useful for this purpose, fostering gradual improvement in skill, focusing on small, precise goals and providing regular positive feedback so that the user receives neither too much direction nor too little. In the software development forum example, incremental badges may be used to break down a task into manageable goals. Badges may be given out for one, 25, 50, 100, 200, and 500 posts rated as helpful, creating several small and successive goals that acknowledge the user upon completion.

Badge descriptions are also useful for communicating feedback. Consider a scenario where exceeding a particular proficiency level requires something that the user may not have considered, or requires the development of some advanced skill—perhaps an online multiplayer game or interoperating simulation instances that allow users to take on the role of a military sniper. In this game, the user may be unable to improve accuracy at distances greater than 600 yards without understanding the effects of wind and gravity. When such required knowledge can be forecasted, it can be communicated to the learner to guide them toward improvement. A badge's description is an excellent candidate for this task: "This badge was awarded for successfully hitting a target at 550 yards. Pay attention to your indicators and account for wind and gravity as you strive to improve beyond 600 yards."

This sort of communication fulfills several roles. First, it provides positive feedback, telling the user that a desirable action or advancement has occurred. Second, it sets a manageable goal: "Improve beyond 600 yards." Third, it directs the learner to the required resources necessary to achieve that goal: "Account for wind and gravity." Fourth, it does not provide excessive support; the user must still study the effects of wind and gravity and commit them to memory before progressing. Finally, this information is provided at a relevant time, with relevant context; the information describes what the user has achieved, what should be achieved next (also facilitating goal setting), and what must be done in order to achieve it. In this manner, a simple badge is effectively able to communicate a time-sensitive complex message with relevance to context.

Again, the social structure of many systems that incorporate digital badges is meaningful in the context of feedback-based badges. Das and LaVoie (2014) argued that social feedback is a major factor driving online behavior. That is, individual response can be motivating to a point—for example, one-to-one commentary from a user to another may drive an individual to change behaviors. However, social feedback (distributed, often publicly visible, user-to-user feedback) can be more strongly motivational, with users

expending more effort in communities where they receive greater social feedback (Das & LaVoie, 2014). The user profile in social networking technologies allows for more formalized reputation management in and across networked communities; participants can use badges to find others with similar skills or shared interests (Gibson, Ostashewski, Flintoff, Grant, & Knight, 2013). Thus the affordances of the socially networked environment allow for potentially greater motivation because of the publicly visible user profile, including badges, that serves as a representation of the user's reputation across communities.

Badges as Narratives

We can also understand badges through narrative-based metaphors. As narratives, badges recount particular user behaviors and experiences within a framework of plot, character, and environment. Indeed, an organization's issuing of a particular badge can be considered "sending out a challenge" (Masura, 2014, p. 12), such as a call to action. Once that challenge has been accepted, performance-based badges speak to a user's proficiency with a set of materials (one's ability to proceed through a plot) while also potentially bolstering or diminishing ethos (character) and framing that accomplishment within the context of a larger environment (level, module, or page). Using a narrative framework for the design of badging systems allows us to think about the stories that our products and documents tell our users. Which interactions are desired, who are the types of users we wish to reward, and how do we wish to tell these user stories within the broader context of our application? Or, even more directly, which challenges can we issue to our users that will create the most compelling dramatic experiences for them as they strive to meet those challenges?

Herman (2009) explained a fundamental notion in research about narrative that separates a story from its telling, or a storyworld from its expression through discourse (see also Bal, 1997). Thus, any given story might have multiple potential tellings as expressed through different chronological framings, perspectives, media conventions, and so forth. We can consider the possible stories told by a collection of badges as distinct from the actual stories communicated through their earning by a particular user who has interacted with the system. Just as one telling of a story through a novel will look different from that same telling through a film or video game, so will one story of a user experience differ from another story of another user's experience in badge acquisition. Socially speaking, then, this presents interesting opportunities given that the adventures undertaken by each badge seeker will inevitably vary from one another.

This may be true, in fact, even if two or more users acquire exactly the same set of badges. A number of other variables may influence the way in which the badges were earned, for example, including the order in which they were obtained and the particular conditions under which each badge was unlocked for each user. Well-designed badges can be earned in a variety of different ways. By thinking about the collection of badges as a quest pool from which smaller sub-quests can be undertaken by users, we can conceptualize each badge as a distinct narrative event or sub-event. Any given event may or may not be experienced by our story's hero, or the user of the system at a particular point in time. Unlike a more traditional story, however, we may have multiple heroes and heroines acquiring badges all at the same time, meaning that multiple acts of narration are occurring simultaneously and multiple stories may be unfolding concurrently within the system.

In this sense, badges can be considered examples of what Sebastian Domsch (2013) termed storyplaying. Drawing from Bode and Dietrich's (2013) conception of the future narrative (FN), storyplaying explores the possibility spaces afforded when one combines narrative events within an interactive context. Video games, for example, which often present multiple storyline possibilities depending on the actions taken by players, are natural media through which to explore storyplaying and future narratives. Interactive fiction (e.g., Montfort, 2003) is equally at home in this medium. In fact, the distinguishing characteristic of a future narrative is "at least one situation that allows for more than one continuation" (Domsch, 2013, p. 1). Branching storylines within video games fit this definition, as do conditional logics within badging systems that allow opportunities for badges to be earned through different user behaviors and different operational logics (a collector logic, for example, requires a thoroughness of exploration from users, while an exigency logic requires extreme speed).

We can use this notion of badges as stories to consider how we design and deploy more engaging badges for our users. For example, under this narrative model, a badge designer has decisions to make about the type of stories he or she wishes to tell within a complex information system. At a high level, the entire system of badges can be considered a metanarrative that communicates values about the actions and events seemed significant enough to be called out explicitly through these designed interactions. The critical plot points, in other words, are made explicit through the selection of user behaviors which must be undertaken in order for the badges to be awarded.

Similarly, the actions and behaviors of users speak to the type of character a designer wishes for her hero or heroine to possess at the end of the experience. What types of behaviors will be most evident for a user who has amassed a large collection of badges? Thoughtful peer reviews and helpful notes on the discussion boards for other users? Stellar individual performance on exams and other assessments? Curious exploration of the nooks and crannies of an information system? The particular conditions that must be met in order for badges to be awarded again speak to the underlying value systems at work within the badging system. Badges are awarded to certain types of users who exhibit certain types of behaviors.

We can also, however, think about storyplaying as a model for teasing apart the differences between badging stories and more traditional forms of narratives as found in fiction, film, and theatre. For example, we might consider character archetypes as one way to evaluate the particular genre in which we are reading/viewing/experiencing, but these character archetypes are necessarily more fluid and dynamic when the storylines can be changed at will by the actions of a system user. Heroes may turn into villains at the drop of the hat, or at least antiheroes, as rules adapt to the behaviors of users. This is particularly evident in role-playing video games, where players may receive some badges for only behaving in questionable ways (such as picking the pockets of townspeople, for example). Similarly, well-designed badging systems may encourage users to branch out from the safe routes and explore a system in more creative or unusual ways in order to broaden their chances of acquiring new badges. In this sense, environmental pressures might be more motivating to our heroes and heroines than plot events or issues of character. In other words, Joseph Campbell's (1949) "call to action" during which the hero is drawn into the beginning of his or her quest is necessarily complicated by the interactive possibilities afforded to the storyplaying user.

The usefulness of this particular conceptualization of badging as storyplaying is perhaps in the familiarity of story to both designer and audience. Designers and users alike have both been exposed to stories from adolescence so the form and function of storytelling is intuitively natural to both sides. We can use this familiarity, then, as designers, to think about narrative qualities as design prompts for our badging systems. For example, we might think about those questions outlined earlier to consider the issues of plot, characterization, and environment when designing our badge systems. We might also think about the dramatic impact of our badges; is there a sufficiently compelling reason to release badges at particular points within our design, and, if so, are the badges designed in such a way to be dramatically compelling and impactful?

CONCLUSION

Digital badges play critical roles in social environments. As mechanisms for reward, feedback, and narrative, they can be informative or persuasive, influencing user behavior or educating users as they strive to improve knowledge, processes, or abilities. As these roles and functions are better understood, along with the resultant design considerations, badges will become important tools for facilitating the interactions between humans and systems in social spaces. As they open new lines of communication between developers and users, well-designed digital badges will enable more intimate connections. In other words, carefully constructed digital badges will make social spaces more social.

This paper contributes to this effort by transferring the lessons taught in the existing literature, from a variety of domains, to badging and to the social realm. As the field progresses, deeper theoretical and empirical study will be needed to understand how to build and use digital badges more effectively—to build better badges.

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