

Exploration of Affordances in Subscription-Based Digital Magazines

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This study analyzed digital magazines (n=128) through the lens of affordance theory in order to determine the current state of digital publishing and establish a framework for the design and development of digital magazines. Twenty affordances were identified and categorized into four distinct groups: extend content, community involvement, utility, and entertainment. These affordances were also interrogated against Gibson's original categorization of perceived, hidden, and false affordances. In order for a digital magazine to be perceived as a successful adaptation of the print issue, it must provide the end user with a unique and immersive experience (Konet al, 2011). In this study however, it was interesting to see that 46% of the magazines reviewed were static replicas of their digital counterparts. Further, the relationship between subscriptions and affordance variety was explored. The study confirmed that there is a non-linear relationship between the two. Subscription rates are not impacted by the variety of affordances present. Future research should examine whether there is value in developing robust digital editions, or if effort should be placed elsewhere.

1. Introduction

From print to digital, the consumer magazine publishing industry is in the midst of a transformation. Print media maintains a number of limitations regarding how to engage its readers with the overall media brand. The assumption is that with the advanced development of digital technology present in the magazine publishing industry, the degree of interaction between magazine brands and readers will be enhanced. From native mobile applications (also known as apps) to subscription-based platforms like Next Issue, there appears to be a collision of online business models. With analogue dollars becoming digital dimes, and now mobile pennies, it is up to the brand to determine whether the app economy is worth the potential investment. If so, whether the return on investment (ROI) is better with a native app or a subscription-based platform.

Next Issue, is a subscription based platform that allows users access to a broad range of magazines for a monthly fee (a business model akin to Netflix in television media). The platform allows the vendor (the magazine brand) the opportunity to increase the degree of interactivity and engagement the consumer has with the digital edition through the use of Adobe Digital Publishing Suite (DPS), one of the most commonly used technologies in this space (C. White, personal communication, June 29, 2015). The incorporation of digital technology is not new to magazine brands (Valentini, 2014). However, with the increase of availability and uniqueness of applications to digital platforms, a digital edition, in today's industry, is significantly more

advanced than uploading an optimized PDF. Instead, today's digital editions approach the idea of increasing user engagement through the extension of content and community involvement. With an estimated 25 percent increase in the Compound Annual Growth Rate (CAGR) of the digital publishing industry over the next four years (by 2019) (Valentini, 2014), it is projected that digital magazines will be fully optimized for the medium on which they are presented.

There are certainly advantages specific to digital media. Mitchell, Christian, and Rosenstiel (2011) analyzed the increase in tablet usage in regards to the level by which content is absorbed by the end user. A recent study from The Association of Magazine Media (MPA) (2014) presents the idea that digitized publications are here to stay. The report shows that "79 of the 100 top-grossing 'Lifestyle' apps are magazine media brands," (p. 57) with Health & Fitness, and Food & Drink categories not far behind. Choosing to replace one medium with another stems from the belief that the new medium holds an advantage over the current selection. This can refer to format, function, as well as content (Mitchell et al, 2011). In the end, while some brands have actively sought out the digital space, others have held back from fear of losing paid subscribers (Guidone, 2000).

Much like a print magazine, a digital magazine must follow a standard set of criteria. Santos Silva (2011) outlines the six key features of a digital magazine as: "1) it has a beginning, middle, and end; 2) it is edited and curated; 3) it has an aesthetic treatment; 4) it is

date-stamped (a series of issues are published during a specific time frame, usually weekly, monthly or quarterly); 5) its contents are permanent; and 6) it is periodic" (p. 302). This has been further explored in terms of enhanced content and e-publications to define digital magazines using three specific characteristics: 1) the digital magazine must be formatted to attract an online reader through the use of digital extras, such as video clips and hyperlinks; 2) it must be designed for easy interaction between the publication and the end user (ex. easy sharing to social media); and 3) the end user must be able to interact with the advertisements (Gordon, 2011).

Broadly, digital publications can take one of two forms—digital replicas and digital editions. The digital replica, a PDF version of the print magazine and newspaper, is considered to be the earliest stated form of digital news (Ashton, 1993; Pesonen, 2014). Kon, Gosalia, and Portelette (2011) note the benefit of a digital publication, with the insistence of a unique experience for the end user. With the developmental increase of mobile technology, end users have an increased selection of features when using digital platforms. Therefore, in order to differentiate a digital edition from a digital replica, the digital edition must provide the end user with a unique and immersive experience. In turn, the end user must be able to interact with the digital content differently than they would with a print magazine (Kon et al, 2011). To generate a positive user experience for the end user, the publisher must acknowledge that "a screen is not a page and it's not looked at in the same usability context as a page" (Schijns and Smit, 2010, p. 35).

Rich media publishing capabilities provide the brand with the capability of not only publishing an interactive publication, but also previewing how rich media elements, such as an embedded Twitter box, appear prior to publishing. Analytic and data reporting capabilities give the brand the capability of determining key analytics, such as amount of time spent browsing a specific article or section. Publication management capabilities allow the brand the capability to effectively manage their workflow and store media. Content distribution capabilities allow the "end user to publish to mobile app stores (such as Google Play or Apple), internal ports, and marketplaces" (Valentini, 2014, p. 3).

This study examines which of these features are being used in the subscription-based magazine market today. Through the lens of affordance theory we describe ways that one can interact with and navigate through a pub-

lication. A successfully digitized magazine can present juxtaposition to its print counterpart. The act of flipping through a print magazine has evolved into a learned behaviour, through the reader's personal experience or observation. However, this learned behaviour isn't so apparent in the digital sphere. As another example, a print magazine affords the end user the option of reserving their place in the magazine through the use of a physical bookmark; this affordance isn't easily translated in the digital format (Maxwell, 2013). The theory of affordance, coined by Gibson (1997), states that everyday items in the world are perceived not only by how they look, but also their functionality and potential action.

In the field of HCI, Waller (2012) identifies the necessity of collaboration between design principles and affordance theory. Implementing affordance theory as a key consideration of layout and design allows the end user the opportunity to accurately perceive the intended affordance. This is essential for an artefact built for function, rather than fashion. A common issue regarding design is the assumption that aesthetics are more important than usability. Norman (2013) argues that the aesthetic appeal is only part of the artefact's success. By maintaining a co-existing relationship between aesthetics and usability, the artefact can present a higher success rate regarding user experience (Norman, 2013; Xenakis and Arnellos, 2013).

The theory of affordance framework is appropriate for this study because of the direct relationship between the end user and the artefact. The different medium used must present the end user with a unique experience when compared to the print version. Therefore, determining what affordances are currently being incorporated is valuable. However, no current industry specific framework for magazine affordances exists.

In addition to developing a categorization system for the affordances present in the magazines studied, the research examines which affordances are most frequently occurring. Lastly, we interrogate whether subscription rates are correlated with digital affordances, with higher rates for publications identifying a greater number of affordances and vice versa.

2. Methods

This study used media content analysis. This is an appropriate method to use because it is common when analyzing media in a systematic and objective manner (Macnamara, 2005; Timberlake, Pechmann, Tran et al., 2011; Berger, 2013). From the 1920s and 1930s where

media content analysis was introduced as a way to study propaganda, to the 1950s where it evolved into a research methodology for media communications, media content analysis is a primary research method regarding mass communications (Mcnamara, 2005). No study exploring affordances of digital magazines has been published; as such using content analysis to describe the landscape of affordances is a primary aim of the study.

During analysis an evolving list of affordances was maintained and every new feature was coded with either a 1 (contains the affordance) or 0 (does not contain the affordance). Not only does the dichotomous code provide the complete number of affordances present in a particular publication, but also it affords the option of analyzing the frequency of a single affordance throughout the set. There were a total of 20 affordances identified, with 3 omitted from analysis as they were imposed to all publications by the Next Issue platform (they were navigate internally, zoom in, and download).

Post-analysis all affordances were categorized and grouped in relationship to their perceived functions. This method of categorization is appropriate for this study due to the high variety of affordances present. One of the outcomes of the research is to provide a new framework for including affordances in digital publications, using affordance theory as the backdrop. This categorization is specific to the field, and will help digital publishers identify what types of interactions they are creating.

Lastly, SPSS was used to gather some descriptive statistics as well as check whether there is a relationship between the variety of affordances in a publication and number of subscriptions. This regression data is presented in results.

3. Results and discussion

This study examines the affordances present within 128 magazines, as of June 2015, located on the Next Issue platform. As shown in Figure 1, there is a 59 to 69 ratio between the number of digital replicas and the number of digital editions analyzed. This indicated that 46 percent—almost half—of the magazines analyzed in this study were digital replicas. This is based on the analysis presented by this study and may not be representative of all digital magazines. Further, data collected shows that the top three implemented affordances were read entire article (97 percent), view additional content (93 percent), and view website (86 percent).

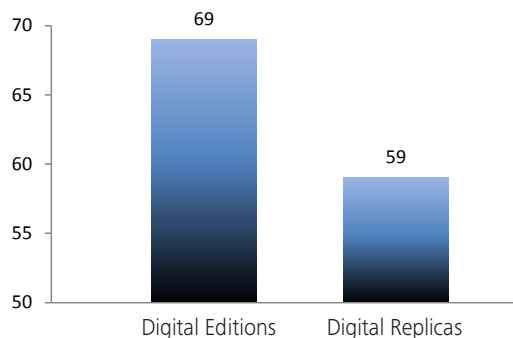


Figure 1: Comparison of Digital Editions to Digital Replicas

As a contribution to scientific literature, this study organizes affordances into four distinct categories: Extend Content, Community Involvement, Utility, and Entertainment (see Figure 3). In addition, all of the categories were only analyzed in regard to the 69 digital editions. Digital replicas were not considered because they do not offer any interactivity, thus the lack of affordances in these issues would skew the results. The four categories identified as the basis for this framework were determined based on the primary functionality of each affordance. For example, share to social media is classified as an affordance under community involvement because it affords the end user the opportunity to connect with their existing community.

Figure 2 identifies the popularity of each of the categories. We see here that extending content, which is an affordance particularly well suited to digital media is the most popular, followed by affordances that pertain to utility. It will be interesting to see how these distributions shift as digital editions grow and mature.

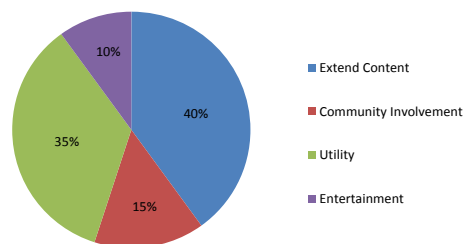


Figure 2: Affordance Categorization

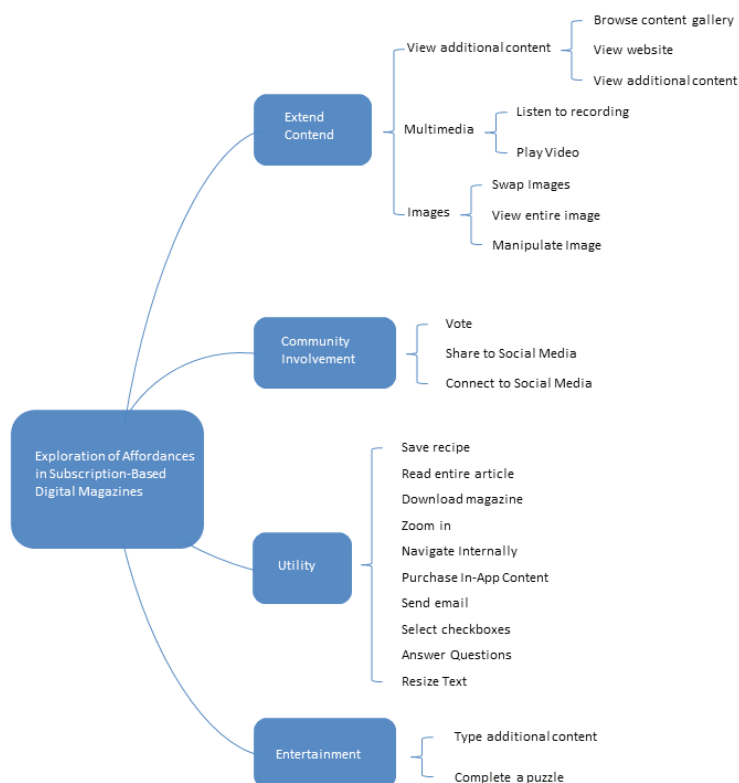


Figure 3: Mindmap of Affordance Categorization

Proposed Framework

In the following section we will explore each of the four proposed categorizations to better understand the framework being proposed.

EXTEND CONTENT

This category is an aggregation of affordances that extend the content present on the page. It consists of: images, videos, multimedia content, links, and buttons, and cumulatively accounts for 40 percent of the affordances identified (see Figure 4). Based on the data collected, in order for an affordance to be considered a successful extension of the magazine's content, it must meet two conditions:

- The digital features presented must extend the content presented on the page, be it through multimedia content, additional text, links, etc.; and
- The publication must allow the end user to engage with the interactive and multimedia content on their own accord.

The direct extension of content is primarily applicable through a digital platform. Through Next Issue's platform the magazine brand is given the necessary freedom to establish as many (or as few) interactive features as they'd like. In regards to content extension, these features include navigation to external sites, image manipulation, viewing additional content, and multimedia content.

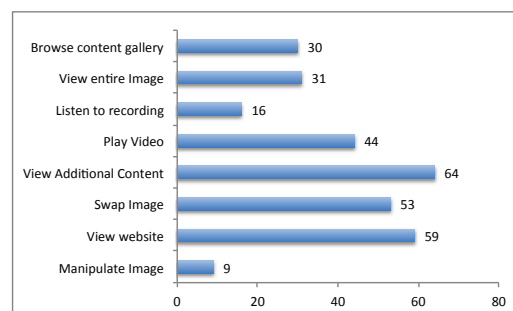


Figure 4: Extend Content Affordances

Throughout this study, content was extended primarily through links, images, and multimedia content. The top three affordances within this section included: view additional content (93 percent), view website (86 percent), and swap image (77 percent).

Compared to its print counterpart, a digital magazine lends itself more favourably to the expansion of content through the click of a button. In the case of popup content, the digital magazine allowed for the addition or removal of overlay content, therefore allowing the end user the option of interacting with the feature. For example, in the June 2015 issue of Entertainment Weekly, popup content was used to enhance a page layout containing a number of celebrities through the use of soundbite descriptions (see Image 1).

COMMUNITY INVOLVEMENT

Community Involvement, accounting for 15 percent of the affordances identified in this study, targets the end user's relationship with the brand through social media and crowdsourcing. The affordances noted within this section include: vote, connect to social media, and share to social media.



Image 1: This Week's Best Soundbites
(Entertainment Weekly)

As shown in Figure 5, the most frequently identified affordance within community involvement was connect to social media. Unlike vote and share to social media, connect to social media is compiled of two features—linked social media icons and an embedded social feed (see Figure 6). The use of linked social media icons, such as the Twitter logo, was one of the most frequently implemented features (61 percent) within this study. Connecting the magazine to the brand's social channels, or even the social channels of the magazine's key personnel, affords the end user the opportunity to expand their knowledge of the brand past a single-issue copy.

One of the difficulties of publishing a digital magazine is right management. Publishers are worried that digital content will result in a loss of paid subscriptions (Guidone, 2000). It is likely that technology around this challenge will continue to improve, and result in more sharing options thus resulting in growth for this category. An impressive example within this research includes National Geographic, which afforded end users the option of sharing a feature article or piece of the magazine via social media (see Image 2). The tweet not only identified that the article was from the digital edition of the magazine, but also provided a link for others to read along.

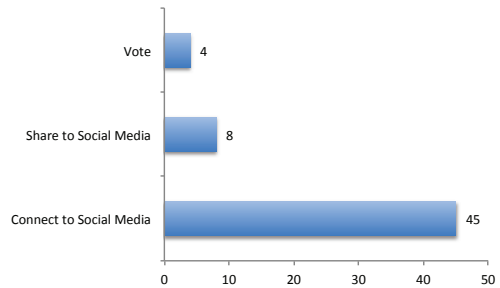


Figure 5: Community Involvement Affordances

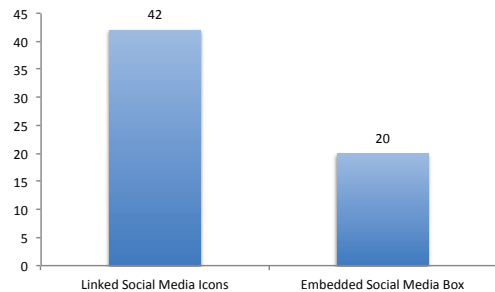


Figure 6: Connect to Social Media Features

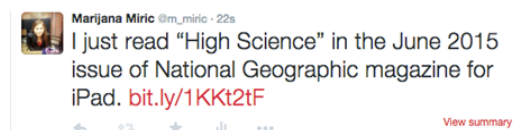


Image 2: Shared Story Tweet

UTILITY

Functionality and navigation are important features to consider when analyzing any product, let alone a digital magazine. This category accounted for 35 percent of the affordances identified within this study. Internal navigation (i.e. navigating from cover to cover) is able to take place throughout a variety of ways—navigation bar, page flipping, hyperlinks, and linked text and images. Each of these features affords the end user the ability to navigate throughout different areas of the magazine.

In addition to horizontal scrolling, where the end user moves their finger right to left to flip the page and continue the editorial, Next Issue affords the use of a vertical scroll bar where the end user is able to extend the content of the story by scrolling up and down through an embedded box. This allows the information presented in the story to be contained and for the reader to mitigate the potential for distraction. The most frequently implemented affordance in this section was read entire article (97 percent) followed by send email (62 percent). Interestingly, this category also had issues around platform, with instances where a call to action was present but not functional. This will be discussed further in a later section.

ENTERTAINMENT

Entertainment accounts for 10 percent of the affordances identified in this study, thus making it the least implemented category. Design features can be added to a digital magazine for no purpose except to entertain the end user. This study consisted of two affordances that fell under the category of entertainment—type additional content and complete a puzzle.

When examined against the remainder of affordances identified in this study, entertainment consisted of only two affordances. Under the affordance of type additional content, found in *O, The Oprah Magazine*, the end user was afforded the option of typing additional content (in this case self-declared labels) for the purpose of interpreting their life in a number of ways. By providing the space and functionality for the end user to interact with the content, the end user is able to have a

more immersive experience. However, when observed in terms of putting together a puzzle (see Image 3), the end user is presented with a different ways of interacting with the content in front of them.

A CLOSER LOOK AT THE ORIGINAL CATEGORIZATION OF AFFORDANCES

Gibson's original framework for affordance uses three specific categories—perceived, hidden, and false affordances. The goal of this section is to describe and identify how these three categories relate to the affordances determined throughout the course of this research. In order to properly determine the frequency of these categories, only the 69 magazines containing affordances were studied.



Image 3: Puzzle (National Geographic)

PERCEIVED AFFORDANCES

A perceived affordance is one where the intended action can be clearly identified for the end user. An everyday example of this is a label on a door identifying whether you should push or pull to open. Using direct perception as a guideline, 35 percent of magazine brands took lack of user knowledge into consideration and provided a legend near the front of the book. This proved useful

when examining features not familiar to the average reader, such as photo scrubbing. Iconography was a popular way to establish that an action should be taken. For example in the case of a video, the icon associated with play video is very popular and thus easily recognizable. In some instances there was a lack of guidance. For example, in the case of linked cover lines, out of the 114 magazines containing linked cover lines, only nine magazines (8 percent) provided a call to action for the end user (as shown in image 4). Unless the affordance is directly perceivable by the end user, the artefact takes on its most basic form (Smith et al, 2013).

HIDDEN AFFORDANCES

Unlike perceived affordances, hidden affordances are defined as affordances that exist, but lack clear identification in the eyes of the end user (McGrenere and Ho, 2000). In the case of this study, the most significant hidden affordance occurred when analyzing the features located under the affordance *navigate internally*.



Image 4: "Zoëy Cover Shoot Video. Tap Here!" (Cosmopolitan)

Navigate internally, was noted in 89 percent of the magazines. However, only 24 percent of magazines containing a linked Table of Contents and 8 percent of magazines containing a linked cover, presented the end user with a call to action (Figure 7). Icons or text instructions are very important for new users. Those who are used to navigating the platform are likely to tap on headlines without specific instruction (R. Swietlik, personal communication, July 21, 2015).

The question here is at what point should a publisher assume that none of its readers are new to the platform?

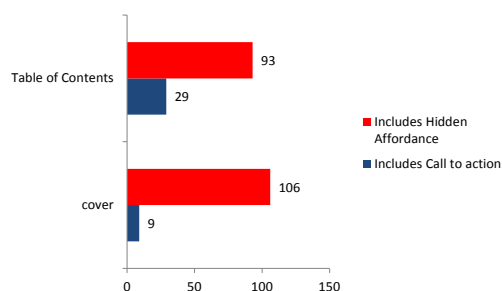


Figure 7: Hidden versus Perceived Affordances

FALSE AFFORDANCES

Unlike perceived and hidden affordances, false affordances provide the end user with the illusion of potential action. Due to the limitations presented by the Next Issue platform, a number of features developed in Adobe DPS were removed when the file was uploaded, but the designer failed to remove the signifier from the page. This affected 20 percent of magazines analyzed in this study that contained affordances.

Based on a study completed in 2014, "the range of interactivity of the final product is determined by the output file type, the type of channel the content can be deployed to, and the robustness of the solution itself" (Valentini, 2014, p. 7). In turn, this can significantly impact what type of interactivity is applied, as well as what type of affordance is triggered. Next Issue was not able to support all of the affordances that the publisher had provided in the initial digital file, leading to false affordances being present.

Common false affordance included scrapbooking recipes, images, and products into a library, as well as bookmarking specific tips or articles that stood out in

the issue. Out of the 24 magazines that included a legend, 58 percent included false affordances. According to Gaver (1991), in order for the end user to properly reject an affordance as false, it must not be perceptible by the end user. In the case of a digital magazine, users are shown a call to action, which can be classified as a perceived affordance. However, when the interaction is not successful, the affordance is classified as a false affordance. Here we need to consider the workflows used to distribute digital publications. It is likely that false affordances will be eliminated in future as we continue to develop the technology solutions involved.

Affordances and subscriptions

A scatterplot was output using SPSS in order to determine whether or not there is a linear or nonlinear relationship between the number of digital subscription rates and the number of affordances. Figure 8, visually represents the nonlinear relationship between the overall number of digital subscriptions and affordances, when analyzed against all 128 magazines. Figure 9 visually represents the nonlinear relationship between the number of digital subscriptions and affordances, when analyzed against all 69 digital editions.

Based on the visual representation shown in Figures 8 and 9, it can be inferred that there is no linear correlation between the number of digital subscriptions and the variety of affordances found in a digital magazine. To further validate the data, each category was also analyzed independently, however the relationship remained non-linear.

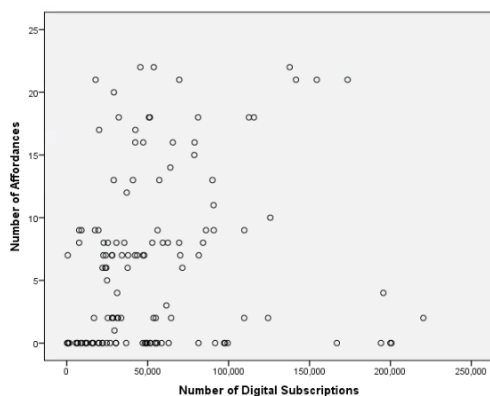


Figure 8: Analysis of all 128 Digital Magazines

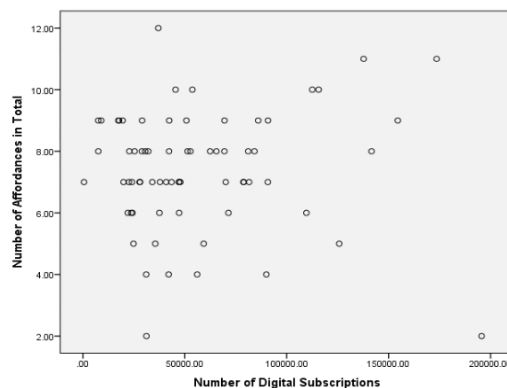


Figure 9: Analysis of all 69 Digital Editions

4. Conclusion

This paper focused on exploring the state of digital magazines through the lens of affordance theory. Twenty affordances were identified and analyzed in this study. They were then grouped into four distinct categories as a way of developing a new framework specific to the magazine industry. These affordances were grouped based on their primary purpose, clearly indicating what affordances were incorporated most frequently.

The framework developed by this study consists of four groups—extend content, community involvement, utility, and entertainment. Extend content was identified as the most frequently implemented while entertainment was the least. Based on an overall regression of the variety of affordances, as well as analysis for each category, there is no relationship between digital subscriptions and the variety or type of affordances present in a publication. As such, since subscription rates are not impacted by the variety of affordances present, and almost half of the magazines were digital replicas, future research should examine whether or not there is value in developing robust digital editions, or if effort should be placed elsewhere.

When analyzed against the categories established in Gibson's original definition, there were a number of hidden and false affordances present throughout the study. This shows that the platform for digital magazines is still evolving. For example, due to technological incompatibility, specific features, often implemented for use in a native application, conflicted with the Next

Issue platform. This, in turn, caused false affordances to exist in 20 percent of the publications studied. To use an everyday example to illustrate the issue, imagine that 2 out of 10 doors you walk through daily are labelled as "push" to open, but are in fact needing you to "pull". This can be very frustrating to the user, and in particular one that is new to a platform and still learning.

Only 35 percent of the publications studied here included a legend that helps the user understand how to navigate the magazine. Combined with the fact that many of the affordances were hidden, and some even false, it is important that this percentage increases in future. If the publisher considers the user through the lens of the proposed framework, they are less likely to make errors. Thoughtfully analyzing affordances and categorizing them will help designers ensure that each affordance is perceived appropriately by the user. Further, the sooner we establish this type of standard, the sooner the actions will become second nature. After all, you would not see "turn corner to flip page" on a printed publication today. Subscription-based providers can be very helpful in this regard, as they apply a more predictable template across all publications.

The design and development of a digital edition has not yet been standardized. This paper identified and introduced a select number of affordances currently in use throughout the magazine publishing industry. Each affordance contributed to the development of the story in a different way. By addressing the purpose of each affordance, and its contribution to the magazine, a unique strategy can be developed using this framework. After all, in order for a digital magazine to be successfully perceived as a digital edition, it must provide the end user with a unique and immersive experience throughout (Kon et al, 2011).

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