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APPROACH

Sandra Weniger*

Claudia Loebbecke†

*University of Cologne, Germany, sandra.weniger@uni-koeln.de

†University of Cologne, Germany, claudia.loebbecke@uni-koeln.de

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DRIVERS OF eBook USE: AN INTERDISCIPLINARY RESEARCH APPROACH

Sandra Weniger, sandra.weniger<at>uni-koeln.de

Claudia Loebbecke, claudia.loebbecke<at>uni-koeln.de

University of Cologne, Germany

Abstract

The evolution of eBooks has made the headlines in the media around the world and has led to lively discussions about if and how eBooks will change the world. Any anticipated changes that the emergence of eBooks might cause, will depend on the corresponding use of the new technology. Whereas research has extensively examined the acceptance and use of IS within organizational settings and for utilitarian purposes, less attention has been paid to the acceptance and use of primarily hedonic IS such as eBooks. In this context, this paper asks "what drives peoples' eBook use". It introduces the emerging eBook phenomenon and outlines a research model that brings together the user intentions grounded in behavioral disciplines and the business models and strategies executed by the eBook providers. It finds that there is a need of interdisciplinary research at the crossroads of psychology, marketing, strategy, and information systems (IS) in order to understand eBook use.

Keywords: hedonic IS, intention to use, intention to buy, eBooks, provider strategies.

1 INTRODUCTION

Information systems (IS) and the Internet have changed the publishing industry. Newspapers and magazines have been published online for years. More recently, with the introduction of eBooks, the digitalization wave has also reached the book sector. So far, press and market research draw a rather rosy picture. The eBook of the future will very likely be less expensive. Simplifying the process to find, buy, and 'use' trade books could support users' perceived ease of use. Likewise, improved text searching should contribute to the perceived usefulness of eBooks, all that fostering use. However, still large groups of book friends cannot imagine reading trade books on an electronic display. They still long for both compelling content material and a similar reading experience compared to that of traditional books. They do not want to miss critical elements of reading experience such as turning pages, annotating, and selecting new items to read very quickly. As everybody is talking about eBooks, one expects new business models and revenue opportunities for book retailers and device manufacturers.

However, the term eBook has been used ambiguously. The International Digital Publishing Forum (www.idpf.org) on the one hand refers to an eBook as "[a] *literary work* in the form of a digital object, consisting of one or more standard unique identifiers, metadata, and a monographic body of content, intended to be published and accessed electronically": On the other hand, it explains that the term eBook "may also refer to the *hardware devices* created for the purpose of reading eBooks". In other words, the International Digital Publishing Forum uses the term eBook both for digital book content *and* for devices such as dedicated eBook readers.

We limit our study and use the term *eBook* solely for *devices or readers that are designed primarily for the purpose of reading books and that deploy the e-ink technology to display content*. We exclude an array of other electronic devices from our study; devices such as computer monitors, laptops, netbooks, smartphones, and iPads that also allow for displaying book content in digital form. Further, as we aim at emphasizing the or maybe just 'a' hedonic context of eBook use, we look solely into the use of such defined eBooks for reading trade eBooks for sale to the general public. They mainly encompass genres such as fiction, general interest non-fiction, guidebooks, and children literature; and need to be distinguished from educational, professional, and scholarly content.¹

There has been extensive IS research on the acceptance and use of IS (Adams et al. 1992; Agarwal & Karahanna 2000; Davis 1989; Davis et al. 1992), mostly focusing on IS used in organizational settings and for productivity purposes. In contrast, eBooks – as understood in this paper – stand for primarily hedonic IS; they provide self-fulfilling rather than instrumental value to readers, serve mainly fun aspects, and are strongly connected to home and leisure activities rather than productive use (van der Heijden 2004). eBooks involve buying decisions prior to their actual use determined by providers' strategic decisions regarding their product and service offerings.

The use of hedonic IS such as the above described eBooks and especially the connection to the respective provider offerings has attracted so far only limited scientific interest. Either studies investigate providers' strategies and business models related to eBook offerings; they typically build on assumptions regarding the demand for eBooks and the related buyer preferences (Loebbecke 2010; Shaver & Shaver 2003; Stahl & Maass 2006). Or studies cover user preferences in the context of eBooks; they tackle the issue of finding out what users and potential users think about eBooks taking the perspective of consumer marketing or psychology (Chu 2003; Loebbecke et al. 2010; Walton 2008). However, we are not aware of any interdisciplinary investigation of the driving forces that shape the acceptance and use of eBooks, although any market success of eBooks requires a sufficient number of eBook users.

1 We focus on using eBooks for reading trade books in spite of a sentiment among vendors and users that some specific features of eBooks (e.g., the possibility to take well-organized notes and the possibility to conduct full-text search or to change the font size) may lead to success especially for educational, professional, and scholarly contents.

But what drives the use of eBooks? Any answer to this question needs to build on a number of research fields. It needs to reach beyond the well-established IS-based acceptance and use insights. Research into the use of eBooks should also take into account (1) the business models and strategies executed by the players involved in the eBook market as the corresponding eBook offerings should shape respective use drivers, and (2) insights on the user intentions grounded in behavioral disciplines including marketing and psychology.

To integrate of ideas and experiences from different perspectives and fields in the effort to understand what drives the use of eBooks, we have developed a research model that incorporates aspects derived from the specific eBook offerings and the corresponding eBook demand modeled as the intention to use eBooks. The model builds on prior works in IS, psychology, marketing, and strategy.

2 eBooks AS RESEARCH SETTING

eBooks as defined for this study have been available for more than a decade. Following the introduction of the Sony Reader in 2005 and the Amazon Kindle in 2007, they gained increasing public attention. By March 2010, almost 40 different devices were available for purchase worldwide (EReaderInfo 2010). Forrester Research (2009a) suggests continuous development and a steady growth combined with price decreases for dedicated eBooks (see Figure 1).

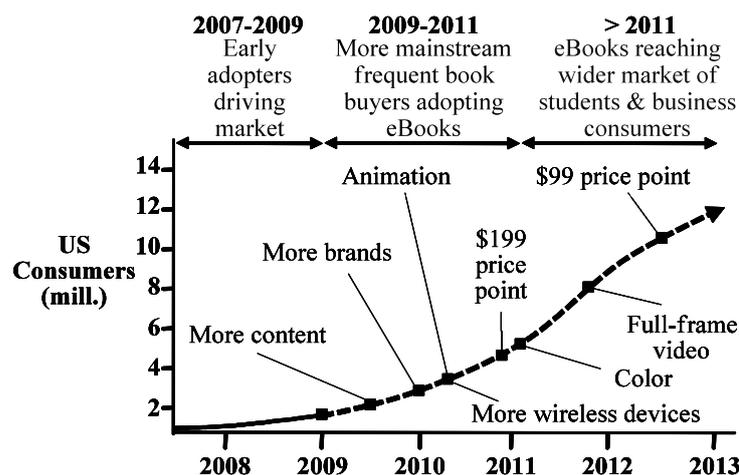


Figure 1: Predicted Demand Development (Forrester Research 2009a)

The increasing variety of devices has come along with decreasing price levels. Whereas the initial price for Amazon's Kindle 2 in 2007 was set at US\$399, after two price decreases in May 2010, Kindle 2 was available for US\$259. Almost 38% of US online adults would intend to buy an eBook within the next six months if the price were US\$98 or less (Forrester Research 2009b).

Especially in the context of reading the content of trade books on eBooks (Loebbecke et al. 2010), users appreciate that eBooks have roughly the same dimensions, but are lighter than a stack of traditional books (Wilson 2003). Ongoing technological progress is likely to reduce the weight of eBooks even further. Users like annotation and text browsing functions, links to electronic dictionaries, sound and multimedia playback, and adjustable font sizes (Chu 2003; Wilson 2003).

However, the eBook diffusion is still limited. Obviously, some issues have to be resolved for a true success story to develop. Not only does one often hear discussions about the purchasing price of the devices and the book titles: Users may also be unwilling or hesitant to abandon familiar habits related to traditional books such as putting books into shelves (Wilson 2003). Further, on a global scale, a

standardized eBook format seems to be a prerequisite for market growth. The open ePub-format (International Digital Publishing Forum 2007) goes in that direction. However, most eBooks still support only a selected number of text formats (eBook Reader Review 2010). Another related issue lies in protection of the digital content. Industry and users are still waiting for the development of broadly accepted Digital Rights Management (DRM) that satisfies users and matches national copyright laws and regulations concerning the resale price.

3 RESEARCH MODEL

From an interdisciplinary literature review across the fields of psychology, marketing, strategy, and IS, we firstly identified established technology acceptance variables such as perceived ease of use and perceived usefulness. Secondly, we became aware of the importance of specific eBook characteristics such as system quality and interoperability likely to influence acceptance and use. Hence, the resulting research model builds on insights about user intentions grounded in behavioral disciplines and concerns regarding business models components and strategies executed by the eBook providers.

In order to accommodate the research setting of eBooks as hedonic IS, we develop a research model that emphasizes the importance of intrinsically motivating states. It stresses a user's perception of eBook-specific factors, and it incorporates a link between intention to use and buying related aspects such as the price level. Derived from the fields of IS, psychology, marketing, and strategy, the model combines seven main variables: (1) quality, (2) cognitive absorption, (3) perceived usefulness, (4) perceived ease of use, (5) perceived enjoyment, (6) perceived price level, and (7) intention to use eBooks. The seven variables are briefly explained below.

The *quality* of eBooks subsumes product and service factors, all derived from providers' business strategies, which together shape the formation of user beliefs (Lederer et al. 2000; Lu et al. 2003), such as perceived usefulness and perceived enjoyment (see below). Quality has four dimensions; they are content quality, system quality, security, and interoperability.

- Content or information quality refers to the desired characteristics of the content / information product such as accuracy, meaningfulness, and relevance. It is important for the formation of user beliefs and intentions to use eBooks (Lin & Lu 2000).
- System quality refers to attributes such as response time, system accessibility, and reliability. It is likely to influence the formation of user beliefs (Davis 1993; Igarria et al. 1995; Lin & Lu 2000; Shin 2009). eBook users would probably dislike poor quality in the sense of delays in response, long waiting periods, interruptions, or bad display quality; they likely would appreciate display improvements concerning light and reflection.
- Security, pointing to a user's perception that the device is able to provide 'secure' services, directly impacts usage intentions (Salisbury et al. 2001; Shin 2009). In the eBooks context, especially privacy is a user concern. Digital Rights Management Systems (DRMS) technologies can enable content providers to monitor the actual usage of the digital content. That is one reason why, from a user's perspective, protected eBooks are less valuable than unprotected ones (Loebbecke et al. 2010; Smith & Telang 2009).
- Interoperability stands for the possibility of using digital content in multiple ways and on multiple devices (Fetscherin 2005). The lack of interoperability among the devices offered by the major players in the eBook industry has resulted in a variety of eBook reading software solutions and related DRM systems in the market, although users find interoperability between devices essential and prefer unprotected and compatible eBooks (Loebbecke et al. 2010).

Cognitive absorption, a state of deep involvement with software (Agarwal & Karahanna 2000) finds its theoretical foundations in individual psychology. Cognitive absorption has four dimensions; they are temporal dissociation, focused immersion, control, and curiosity: Temporal dissociation represents

the inability to register the passage of time while being engaged in interaction. Focused immersion refers to the experience of total engagement when other attentional demands are ignored. Control describes the user's perception of being in charge with the interaction. Curiosity refers to the extent the experience arouses an individual's sensory and cognitive curiosity. In IS, applying the concept of cognitive absorption has been mainly limited to the formation of user beliefs in productivity-oriented, organizational settings (Saade & Bahli 2005). However, representing an intrinsic motivator, in our model cognitive absorption is assumed to influence the intention to use eBooks as hedonic systems (see also van der Heijden 2004).

Perceived usefulness, a direct antecedent to the intention to use eBooks, is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis 1989, p. 320). Due to our focus on devices used for reading trade eBooks, our understanding of perceived usefulness rather refers to using an eBook for consuming trade eBook content being perceived as useful.

Perceived ease of use, the second direct antecedent shaping the intention to use eBooks, captures the degree to which a person believes that using eBooks would be free of effort (Davis 1989).

Although perceived usefulness and perceived ease of use have been developed and mainly applied to organizational settings (Davis 1989; Davis et al. 1989; Davis et al. 1992) and although Benbasat and Barki (2007) question the general suitability of utilitarian TAM constructs in hedonic contexts, we include both variables in the research model. We partially build on some literature that points to a close connection between perceived usefulness and perceived ease of use on the one hand and the hedonic value on the other (Venkatesh 1999; Venkatesh 2000; van der Heijden 2004).

Perceived enjoyment, the third direct antecedent to the intention to use eBooks, describes "the extent to which the activity of using the computer is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated" (Davis et al. 1992, p. 1113). Such intrinsic motivation is likely to influence the intention to use hedonic systems such as eBooks used for reading trade books (van der Heijden 2004).

Perceived price level, the fourth and final direct antecedent shaping the intention to use eBooks reflects that the price significantly influences the use of eBooks (Lichtenstein et al. 1993; Pavlou & Fygenon 2006; Zeithaml 1988). It directly links the 'intention to use' and buying and thus accommodates a difference between hedonic IS such as eBooks and IS mainly deployed in the organizational settings. The use of hedonic IS typically requires users being willing to pay – directly for usage or access or indirectly via advertisement based business models (Pavlou & Fygenon 2006). With perceived price level, the model captures the user's willingness to pay.

Finally, the *intention to use* serves as dependent variable determining the actual use behavior (Davis 1989; Davis et al. 1989; van der Heijden 2004).

The seven variables are linked by *ten propositions* (see Table 1). Integrating quality as a variable that influences cognitive absorption, perceived usefulness, and perceived enjoyment (Kettinger & Lee 1994; King & Epstein 1983) leads to the first three propositions. In contrast to Igarria et al. (1995) and Lin & Lu (2000), our model does not include a direct relationship between quality and perceived ease of use. A person who experiences the state of cognitive absorption while using an eBook may be so engaged in the interaction (focused immersion) that she loses her ability to register the passage of time (temporal dissociation) and rationalizes that using the eBook must be either enjoyable (P4), or useful (P5). The deeper a person is cognitively absorbed, the easier she perceives the eBook usage (P6). Further, the perceived enjoyment may serve as intrinsic motivator and as such positively influences the intention to use eBooks (P7). The 'more' users perceive eBooks as useful, the more they intend to use them; this implies P8 that perceived usefulness is likely to influence the intention to use IS (Agarwal & Karahanna 2000; Davis et al. 1992; Venkatesh 1999). The assumption that a person is more likely to use eBooks when she perceives them as easy to use (Davis 1989; Gefen & Straub 2000; Venkatesh 1999) is modeled in P9. Finally, P10 reflects that pricing and the price level perceived by the user seem to be important for the intention to use a service (Lichtenstein et al. 1993; Zeithaml 1988). Table 1 summarizes the ten propositions and the respective references.

Proposition		Selected References
P1	Quality positively influences cognitive absorption.	Kettinger, Lee '94; King, Epstein '83
P2	Quality positively influences perceived enjoyment.	Davis et al. '92
P3	Quality positively influences perceived usefulness.	Lin, Lu '00; Shin '09; Venkatesh '00
P4	Cognitive absorption positively influences perceived enjoyment.	van der Heijden '04
P5	Cognitive absorption positively influences perceived usefulness.	Agarwal, Karahanna '00
P6	Cognitive absorption positively influences perceived ease of use.	Agarwal, Karahanna '00
P7	Perceived enjoyment positively influences the intention to use eBooks.	Davis et al. '92; van der Heijden '04
P8	Perceived usefulness positively influences the intention to use eBooks.	Adams et al. '92; Davis et al. '89; Davis et al. '92; Venkatesh '99; Venkatesh '00
P9	Perceived ease of use positively influences the intention to use eBooks.	Venkatesh '99; Venkatesh '00
P10	Perceived price level negatively influences the intention to use eBooks.	Pavlou, Fygenson '06; Wu, Wang '05

Table 1: Model Propositions

4 DISCUSSION AND OUTLOOK

The model takes a holistic view. It suggests that studying the use of hedonic IS such as eBooks requires a research stream which bridges different academic disciplines. The model links acceptance and use to buying decisions. It builds on the established insight that any buying decision (demand side) is a reaction to a specific product, here eBook, offering. Any such offering results from providers' decisions regarding product design, business model, and strategy, which together determine product quality and price (supply side).

Focusing on the demand side, i.e., on users' perceptions and buying decisions as reactions to providers' offerings, the model investigates the drivers of eBooks use as they are offered in the market. In this respect, the model finds its intellectual home in traditional IS and in behavioral disciplines such as marketing and psychology. Studying user beliefs and incorporating perceived enjoyment, the model incorporates the importance of intrinsically motivating states – typical for the use of hedonic IS (Benbasat & Barki 2007; van der Heijden 2004). The model builds on psychological research which typically tries to understand the 'black-box', i.e., what happens within the user between his exposure to external stimuli and his actual behavior.

Concerning the supply side, the model includes providers' decisions as to which specific eBook features to offer via which business and pricing model. Those considerations find their theoretical grounding in the literature on business strategy, innovation, and organizational development (e.g., Caves 2002; Christensen 1997; Lee & O'Connor 2003). The providers' decisions appear twice in the research model – as quality and perceived price level. The quality variable models the users' perception of technical product qualities such as flexible color e-ink touch displays, audio and video functions, or DRM solutions. The perceived price level reflects providers' business model decisions. It bridges between the demand / user perspective by directly linking actual use and demand to providers' business decisions and resulting supply.

One may argue whether such an interdisciplinary research endeavor risks losing depth at all ends. There must have been good reasons why research designs and units of analysis traditionally differed depending on the research focus and the theoretical grounding. However with sufficient knowledge of the different academic disciplines and of the relevant markets and uses of objects under investigation (eBooks, hedonic IS), linking different elements of user behavior and provider strategies should allow for developing valuable insights. The respective research efforts² should lead to a better understanding of the acceptance and use of hedonic IS which should be important to vendors, designers, managers, and other stakeholders, who are interested in promoting system usage within their respective constituents, that the practical contribution outweighs eventual methodological deficiencies.

Further, one may debate the pros and cons of working with a holistic and interdisciplinary research model that needs genre-specific operationalization especially for the variables quality and perceived price level. The quality features modeled for eBooks naturally differ from the quality features modeled for IPTV, another well-known hedonic IS investigated based on the model outlined above (Loebbecke & Weniger 2010; Weniger 2010).

Insights based on genre-specific models allow for more tailored recommendations to practice (Hsu & Lu 2004; Jung et al. 2009; Vijayasathy 2004). But, however relevant such insights – typically published in the press, in trade magazines, and perhaps in case studies – might be, they may not lead to the theoretical advancement required for scientific work. Therefore it needs to be discussed whether various model applications to different, specifically modeled genres of hedonic IS such as eBooks, IPTV, Mobile TV, or Digital Video Recorders (Jarvenpaa & Loebbecke 2009; Loebbecke 2004; Loebbecke & Radtke 2005; Loebbecke & Radtke 2006; Loebbecke & Weniger 2010; Loebbecke et al. 2010) together could and should lead to a general research model. Or, whether for any scientific endeavor to contribute to the development of theory (Wacker 1998; Whetten 1989), it will be necessary to make use of a more generally designed model, which is simultaneously applicable across different genres of hedonic IS.

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2 For instance, when using the model for our empirical study on IPTV acceptance and use, we applied Structural Equation Modeling (SEM) and used Partial Least Squares (PLS) as SEM technique. PLS allowed considering variables with reflective and formative indicators. Calculating the variance inflation factor (VIF) and the condition index (CI), we ruled out multi-collinearity. We analyzed the local quality criteria for dependent variables with the coefficient of determination (R²) for each dependent construct and finally, to assess the proposed relationships, we tested for the sign of the path and then evaluated the significance of path coefficients (interpreted as standardized beta weights in the regression analysis).

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