International Journal of Research in Marketing 33 (2016) 276–296

Contents lists available at ScienceDirect

IJRM
International Journal of Research in Marketing
journal homepage: www.elsevier.com/locate/ijresmar

Platform adoption in system markets: The roles of preference heterogeneity and consumer expectations

Michael Steiner [a,1], Nico Wiegand [b], Andreas Eggert [c,d], Klaus Backhaus [b,2]

[a] University of Witten/Herdecke, Alfred-Herrhausen-Straße 50, 58448 Witten, Germany
[b] University of Muenster, Marketing Center Muenster, Am Stadtgraben 13–15, 48143 Muenster, Germany
[c] University of Paderborn, Warburger Strasse 100, 33098 Paderborn, Germany
[d] Newcastle University Business School, 5 Barrack Road, Newcastle upon Tyne NE1 4SE, UK

ARTICLE INFO

Article history:
First received on May 26, 2014 and was under review for 6½ months
Available online 14 June 2015

Keywords:
Network effects
Platform adoption
Systems markets
Expectations management
Heterogeneity
Video gaming

ABSTRACT

Platform-based systems have become the dominant way to market consumer entertainment products. Video games are, for instance, distributed in digital data form, which can only be used on compatible hardware. Network effects drive the diffusion of such systems. This article provides insights into market heterogeneity and the role that expectations of the direct and indirect network effects plays in the game console market. The results of two empirical studies suggest that the console market is strongly fragmented and that the perceptions of network effects differ between the various target segments. The same holds for the importance of consumer expectations: For instance, hardcore gamers make predictions about the future software availability and incorporate these into their current adoption decision, while social gamers care more about the expected potential to interact with others. When introducing novel technologies, platform sponsors can benefit from improved targeting by, for example, providing software selectively, instead of large varieties early on. This study identifies the limits of go-to-market strategies derived from aggregate analyses when dealing with network effects and shows that behavioristic insights should complement them.

1. Introduction

Systems provide value through the interplay between a platform and compatible complements (Lee & O'Connor, 2003). Typical examples are most entertainment products based on hardware/software architectures[3] (e.g. Katz & Shapiro, 1994): A television set depends on the availability of TV channels, smartphones rely on software applications, e-book readers require digital book content, and game consoles are useless without compatible game titles. Increased digitalization has made these platform-based systems ubiquitous and has altered the market dynamics and consumption behavior globally. Consequently, their underlying economic peculiarities have received much attention (e.g. Eisenmann, Parker, & van Alstyne, 2011; Zhu & Iansiti, 2012). Our target is the home video game console industry, an often-cited canonical example of platform-based systems (Dubé, Hitsch, & Chintagunta, 2010; Corts & Lederman, 2009) and, with the recent release of PlayStation 4 and Xbox One, a highly topical battleground for academics and marketers.

E-mail addresses: Michael.Steiner@uni-wh.de (M. Steiner), nico.wiegand@ymail.com (N. Wiegand), aeggert@notes.upb.de (A. Eggert), Klaus.Backhaus@uni-muenster.de (K. Backhaus).
[1] Tel.: +49 2302 926 571.
[2] Tel.: +49 251 83 22861; fax: +49 251 83 22903.
[3] Prior research usually refers to the platform as *hardware* and to complements as *software* (Church & Gandal, 1992; Gandal et al., 2000). We follow this convention throughout this paper.

http://dx.doi.org/10.1016/j.ijresmar.2015.05.011
0167-8116/

System markets have primarily been discussed against the background of network effects, i.e. the dependence of consumer value on the installed base (IB) of users (Chou & Shy, 1990; Church & Gandal, 1992). Direct network effects arise when additional network members instantly enhance a product's possible uses for an individual, as in the case of direct communication technologies (Lee & O'Connor, 2003). The more people use a communication service, the more numerous their options to interact. Indirect network effects, on the other hand, are specific to system markets: A larger IB of platform owners leads to more complementary goods (CG), which in turn positively affect customers' perceived value of the platform (Stango, 2004). Therefore, it has been suggested that indirect network effects are crucial drivers of platform diffusion and eventual success (Schilling, 1999; Shankar & Bayus, 2003).

This study addresses important gaps in the literature. First, empirical research on system markets has focused on detecting the indirect network effects of various entertainment products, including DVDs (Inceoglu & Park, 2011), computer hardware and software (Frels, Shervani, & Srivastava, 2003), CDs (Basu, Mazumdar, & Raj, 2003), VCRs (Park, 2004), and home video games (Chintagunta, Nair, & Sukumar, 2009). To date, direct network effects have been rarely considered (e.g. Molina-Castillo, Munuera-Alemán, & Calantone, 2011). One reason for this is that many platform sponsors have only recently begun to integrate and promote the possibility of a direct interaction with users of the same system (e.g. in-game communication with other game console users).

Second, most previous work on indirect effects focuses on aggregate market analyses, using information on hardware sales and software quantities (e.g. Basu et al., 2003; Stremersch, Tellis, Franses, & Binken, 2007). Survey-based studies that enable individual-level data analysis are scarce.[4] Consequently, previous research often has two limitations: First, network effects are dealt with in an undifferentiated manner. Consumers are treated as homogeneous entities and the study results reflect the market averages. Heterogeneous preferences and perceptions of network variables are neglected, despite several scholars having identified these as a primary and fruitful research area in the network effects literature (e.g. Dubé et al., 2010; Zhu & Iansiti, 2012).

Third, although discussed in theoretical terms in numerous studies (Besen & Farrell, 1994; Katz & Shapiro, 1994; Lee & O'Connor, 2003), consumer expectations have rarely been considered empirically in a network context. The few studies that incorporate expectations in their attempts to model indirect network effects do so under strong assumptions, such as naïve or rational decision making (e.g. Dubé et al., 2010; Park, 2004; Zhu & Iansiti, 2012). Only Frels et al. (2003) use survey data on the expectations of the installed base's future developments and of the availability of complements. However, this study does not explicitly assess the role of expectations, instead considering them a dimension of network strength and focusing on analyzing this aggregate measure. To the best of our knowledge, no previous study has assessed the influence of expectations on system adoption from a consumer perspective.

Fourth, the initial product launch stage, which is the most competitive stage in system markets (Andreozzi, 2004; Williams, 2002), has received limited research attention. Arguably, customer expectations may play an important role in this early stage and managers need to understand whether and to what extent they impact customers' adoption intention. For example, managers could invest heavily in the software that is available right from the start. Alternatively, they might stress a console's potential to connect with other gamers. Against this background, we need more insights on how customers' direct and indirect network expectations drive their adoption intention.

We contribute to extant literature by addressing these four areas within a framework of two different, yet complementary empirical studies. First, we assess consumer heterogeneity by developing a taxonomy of game console users. Employing choice-based conjoint analysis, we elicit consumer preferences and identify latent market segments. We determine four such segments, which differ substantially in their valuation of network effects variables and personal characteristics. While study 1 clarifies *what* variables are important for consumers' adoption intention in the console market, study 2 goes a step further and provides a process model that details *how* these variables work together to form consumers' adoption intention. We integrate customer expectations of the direct and indirect network effects, that could not be included in a conjoint task which requires deterministic information on the given attributes and levels, in a hierarchy-of-effects model based on Zeithaml's (1988) perceived value model. Our analysis shows that expectations of the future network effects, which strongly depend on segment affiliation, affect platform adoption. However, our results do not confirm the unconditional importance of expectations in system markets, which some researchers suggest (e.g. Shapiro & Varian, 1999; Farrell & Klemperer, 2007).

Researchers can rely on two different approaches to study platform adoption in system markets: First, they can draw on existing sales data to estimate market response models. Second, they can use mindset metrics, such as customer attitudes, expectations and intentions to better understand the adoption process. Both approaches have their pros and cons. While market response models have the advantage of using "hard data," they can only be estimated when sales figures are available, i.e. after the market launch of the platform system. In contrast, models relying on customer mindset metrics may be employed before the market launch. We purposely conducted our studies before the market introduction at a time when relevant information on consoles, some of the first games, prices, etc. was discussed in the press and in public, but the network effects' influence on the future system value was still unclear. Our research shows how customer mindset metrics can inform managers and provide much needed guidance in the early stages of market introduction.

We contribute to research on system markets, and especially on the video game console industry, by (1) jointly examining the direct and indirect network effects at the individual level, (2) by demonstrating that the impact of the installed base and complementary goods differs between various market segments, (3) by demonstrating that expectations play a less prominent role in

[4] To our best knowledge, the only exceptions that use survey or experimental data on an individual level are the studies by Frels et al. (2003), Gupta et al. (1999), Molina-Castillo et al. (2011), and Song et al. (2009).