

THE LOGIC OF DIGITAL PLATFORM DISRUPTION: A RESEARCH AGENDA

Erol Kazan, Department of IT Management, Copenhagen Business School, Denmark, eka.itm@cbs.dk

Chee-Wee Tan, Department of IT Management, Copenhagen Business School, Denmark,
cta.itm@cbs.dk

Eric T. K. Lim, School of Information Systems, Technology and Management UNSW Business
School, University of New South Wales, Australia, e.t.lim@unsw.edu.au

Abstract

Digital platforms are disruptive IT artifacts, because they facilitate the quick release of innovative platform derivatives from third parties (e.g., apps). This study endeavours to unravel the disruptive potential, caused by distinct designs and configurations of digital platforms on market environments. We postulate that the disruptive potential of digital platforms is determined by the degree of alignment among the business, technology and platform profiles. Furthermore, we argue that the design and configuration of the aforementioned three elements dictates the extent to which open innovation is permitted. To shed light on the disruptive potential of digital platforms, we opted for payment platforms as our unit of analysis. Through interviews with experts and payment providers, we seek to gain an in-depth appreciation of how contemporary digital payment platforms are designed and configured to foster open innovation. We envision that this study bridges existing knowledge gaps between digital platform and innovation literature.

Keywords: *Digital Platforms, Disruption, Open Innovation, Layered Modular Architecture, Digital Payment.*

Introduction

Digital platforms (e.g., Apple's App Store) are layered modular IT architectures (Yoo et al. 2010) that facilitate the quick release of innovative platform derivatives from third parties. Compared to their physical counterparts (e.g., product platforms) (Gawer et al. 2013), digital platforms are particularly disruptive because they alter conventional market structures by unbundling once glued value streams and bundling their core services with a range of other innovative platform derivatives in a rapid fashion (Burgelman et al. 2007; Downes et al. 2013). We advance a research model that defines the disruptive potential of digital platforms in terms of their: (1) strategic business profiles (Miles et al. 1978); (2) design and configuration (Iyer et al. 2010; Yoo et al. 2010); (3) technology attributes (Besen et al. 1994; Chen et al. 2010), as well as; (4) open innovation and open business models (Chesbrough 2003; West et al. 2014). In doing so, this study takes a small but concrete step towards developing a theory of digital platform disruption, while concurrently, setting the stage for recommending managerial prescriptions aimed at designing and configuring digital platforms.

Digital Platform Disruption Model: A Theoretical Overview

Disruptive innovation can be classified into new market (i.e., uncontested market space) (Kim et al. 2004), or low-end disruption (i.e., an initial underperforming market which upsets the status quo over time) (Christensen et al. 1996). By embracing the firm's perspective, we advance a research model of *digital platform disruption* (see Figure 1).

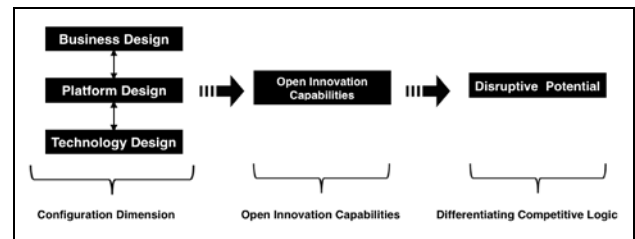


Figure 1. Digital Platform Disruption Model

Support for Open Innovation: Open innovation

is leveraging internal and external ideas to develop novel products and services (Chesbrough 2003) and open business model is the commercialization of co-created ideas (Chesbrough et al. 2006). For this reason, open innovation and open business model are suitable theoretical lenses for describing how coupled open innovation can be fostered via digital platform (West et al. 2014). Digital platforms selectively integrate (core) innovations into their core systems to augment the architectural foundation for other platform derivatives. Building on the notion of strategic alignment (Henderson et al. 1993), we delineate support for (open) innovation into: (1) **business design** (i.e., *strategic* orientation of a digital platform for a given market), (2) **platform design** (i.e., *governance* of a digital platform from an architectural viewpoint), and; (3) **technology design** (i.e., *deployment* of hardware and software). We argue that the design and configuration of these three design components culminate in *conducive* conditions for open innovation, which in turn dictates the potential of digital platforms for introducing disruptive potentials into markets (Kazan et al. 2013; Kazan et al. 2014a; Kazan et al. 2014b).

Business Design: Business management activities can be classified into *four* industry-independent *strategic business profiles* (Miles et al. 1978; Sabherwal et al. 2001): (1) *Defender* adheres to an exploitative strategy; (2) *Prospector* adheres to an explorative business strategy; (3) *Analyser* adheres to an ambidextrous business strategy (*Defender & Prospector*), and; (4) *Reactor* refers to a lack of strategy. Likewise, we contend that digital platforms may embody the abovementioned business orientation in their operations, thereby shaping the choice of technology and platform design options.

Platform Design: We conceive digital platforms not as monolithic IT artifacts, but as comprising *five* distinct *platform layers* (i.e., content, service, network, system and device) with their corresponding modules on each layer (Kazan et al. 2014b; Yoo et al. 2010). Consequently, *platform governance* (Ghazawneh et al. 2013; Iyer et al. 2010; Tiwana et al. 2010) not only determines the configuration of digital platforms on each platform layer, by being either loosely coupled or vertically integrated (cf. Pagan 2013), but it also regulates the accessibility and openness (modifiability) of *each platform layer* (Kazan et al. 2014a). We hence postulate that the *governance of platform layers* may lead to

centralized, hybrid and decentralized platforms, which in turn impacts the support of digital platforms for open innovation.

Technology Design: Standard technology components can be converted and configured into digital platforms that are either: (1) *propriety*; (2) *compatible*, or; (3) *agnostic* (Besen et al. 1994; Katz et al. 1986; Shapiro et al. 1998; West 2003; West et al. 2000). The dominance of the certain technology attributes may thus lead to differentiated technology profiles (i.e., technology design), which in turn shapes the capability of digital platforms for developing innovative platform derivatives.

Methodology

We plan to blend quantitative and qualitative methods (Creswell et al. 2007; Venkatesh et al. 2013) for validating our research model. Mixed method brings the advantage of meta-inferences to: (1) overcome weaknesses associated with reliance on a single method, and; (2) permit theoretical complementarities to emerge between qualitative and quantitative insights. Data gathered via mixed methods is not only simultaneously rich in breadth (quantitative) and depth (qualitative), it can also fulfil both explorative and confirmative objectives within the same empirical inquiry. Our mixed method approach is explorative and adheres to the sequential study approach: a qualitative study (semi-structured interviews) followed by a quantitative study (online survey) in order to yield deep insights into the configuration of disruptive digital platforms while having the capacity to generalize our findings beyond a limited sample of cases (Venkatesh et al. 2013). Beginning with multiple and interpretative case studies (Walsham 1995; Yin 2009), we have contacted knowledgeable interviewees belonging to digital payment providers as well as consultants and payment associations in order to obtain a holistic view of the digital payment landscape. Interviews were conducted in a semi-structured format. Interview questions were formulated from our proposed digital platform disruption model, especially with regards to understanding events and decisions leading up to: (1) how and why digital payment platform owners choose to design and configure their payment solutions from an architectural point of view (e.g., centralized), as well as; (2) the business and technology strategies employed by these owners when designing and configuring their digital payment platforms. Upon the completion of the qualitative study, we will embark on a quantitative study in the form of an online survey questionnaire that we plan to administer on a much larger sample of key stakeholders within the digital payment industry. It is envisioned that the data from the online survey will be utilized to validate the impact of business, platform and technology designs on the configuration of digital platforms for market disruption. In turn, this will lay the groundwork for further research into the disruptive capabilities of digital platform design and configuration.

Contributions to Theory and Practice

This study bridges knowledge gaps between innovation and digital platform literature by uncovering how digital platforms are designed and configured for innovation and disruption. By advancing a more fine-grained and integrated model of digital platform disruption, we hope to reveal: (1) distinct configurations of digital platforms corresponding to their potential for market disruption, as well as; (2) business and technology profiles which align with these configurations. From being initially descriptive and illustrating correlational relationships among the theoretical constructs, we foresee that this line of research will set the foundation for explaining and predicting digital platform disruption from both incumbents' and disrupters' standpoint. We seek to contribute to theory and practice on three fronts. First, this study extends the strategic typology of Bharadwaj et al. (2013) and Miles et al. (1978) to the context of digital platforms. Second, this research contributes to information systems strategy literature (Sabherwal et al. 2001). Past studies have investigated the attributes of *internal* IT system of organizations and their strategic implications. This research therefore aims to extend this research stream by exploring intertwined and interdependent *internal* as well as *external systems*. Third, this research also contributes to open innovation and digital platform literature by disentangling the effects of pursuing different business, platform and technology design options on the capability of digital platforms for open innovation and market disruption (Chen et al. 2010).

References

- Besen, S. M., and Farrell, J. 1994. "Choosing How to Compete: Strategies and Tactics in Standardization," *The Journal of Economic Perspectives* (8:2), pp 117-131.
- Bharadwaj, A., El Sawy, O. A., Pavlou, P. A., and Venkatraman, N. 2013. "Digital business strategy: toward a next generation of insights," *MIS Quarterly* (37:2), pp 471-482.
- Burgelman, R. A., and Grove, A. S. 2007. "Cross-boundary disruptors: powerful interindustry entrepreneurial change agents," *Strategic Entrepreneurship Journal* (1:3-4), pp 315-327.
- Chan, Y. E., Huff, S. L., Barclay, D. W., and Copeland, D. G. 1997. "Business Strategic Orientation, Information Systems Strategic Orientation, and Strategic Alignment," *Information Systems Research* (8:2), pp 125-150.
- Chen, D. Q., Mocker, M., Preston, D. S., and Teubner, A. 2010. "Information systems strategy: reconceptualization, measurement, and implications," *MIS quarterly* (34:2), pp 233-259.
- Chesbrough, H. 2003. *Open innovation: The new imperative for creating and profiting from technology*, (Harvard Business Press).
- Chesbrough, H., Vanhaverbeke, W., and West, J. 2006. *Open innovation: Researching a new paradigm*, (Oxford university press).
- Christensen, C. M., and Bower, J. L. 1996. "Customer Power, Strategic Investment, And The Failure Of Leading Firms," *Strategic Management Journal* (17:3), pp 197-218.
- Creswell, J. W., and Clark, V. L. P. 2007. "Designing and conducting mixed methods research,").
- Downes, L., and Nunes, P. F. 2013. "Big-Bang Disruption," *Harvard Business Review* (91:3), pp 44-56.
- Gawer, A., and Cusumano, M. A. 2013. "Industry Platforms and Ecosystem Innovation," *Journal of Product Innovation Management*), pp n/a-n/a.
- Ghazawneh, A., and Henfridsson, O. 2013. "Balancing platform control and external contribution in third-party development: the boundary resources model," *Information Systems Journal* (23:2), pp 173-192.
- Henderson, J. C., and Venkatraman, N. 1993. "Strategic alignment: Leveraging information technology for transforming organizations," *IBM systems journal* (32:1), pp 4-16.
- Iyer, B., and Henderson, J. C. 2010. "Preparing For The Future: Understanding The Seven Capabilities Cloud Computing," *MIS Quarterly Executive* (9:2), pp 117-131.
- Katz, M. L., and Shapiro, C. 1986. "Product Compatibility Choice in a Market with Technological Progress," *Oxford Economic Papers* (38), pp 146-165.
- Kazan, E., and Damsgaard, J. 2013. "A Framework For Analyzing Digital Payment As A Multi-Sided Platform: A Study Of Three European NFC Solutions," in *ECIS 2013: Utrecht*.
- Kazan, E., and Damsgaard, J. Year. "An Investigation Of Digital Payment Platform Designs: A Comparative Study Of Four European Solutions," Proceedings of the European Conference on Information Systems (ECIS) 2014, Tel Aviv, Israel, Association for Information Systems 2014a, p. 15.
- Kazan, E., Tan, C.-W., and Lim, E. T. K. 2014b. "Towards a Framework of Digital Platform Disruption: A Comparative Study of Centralized & Decentralized Digital Payment Providers," in *Proceedings of the Australasian Conference on Information Systems ACIS 2014: Auckland New Zealand*.
- Kim, W. C., and Mauborgne, R. 2004. "Blue Ocean Strategy," *harvard business review*), p 1.
- Miles, R. E., Snow, C. C., Meyer, A. D., and Coleman, H. J., Jr. 1978. "Organizational Strategy, Structure, and Process," *The Academy of Management Review* (3:3), pp 546-562.
- Pagani, M. 2013. "Digital Business Strategy And Value Creation: Framing The Dynamic Cycle Of Control Points," *MIS Quarterly* (37:2), pp 617-632.
- Sabherwal, R., and Chan, Y. E. 2001. "Alignment Between Business and IS Strategies: A Study of Prospectors, Analyzers, and Defenders," *Information Systems Research* (12:1), pp 11-33.
- Shapiro, C., and Varian, H. R. 1998. "Information Rules: A Strategic Guide to the Network Economy," *Harvard Business School Press Books*), p 1.

- Tiwana, A., Konsynski, B., and Bush, A. A. 2010. "Research commentary-Platform evolution: Coevolution of platform architecture, governance, and environmental dynamics," *Information Systems Research* (21:4), pp 675-687.
- Venkatesh, V., Brown, S. A., and Bala, H. 2013. "Bridging The Qualitative-Quantitative Divide: Guidelines For Conducting Mixed Methods Research In Information Systems," *MIS Quarterly* (37:1), pp 21-54.
- Walsham, G. 1995. "Interpretive case studies in IS research: nature and method," *European Journal of information systems* (4:2), pp 74-81.
- West, J. 2003. "How open is open enough?: Melding proprietary and open source platform strategies," *Research policy* (32:7), pp 1259-1285.
- West, J., and Bogers, M. 2014. "Leveraging External Sources of Innovation: A Review of Research on Open Innovation," *Journal of Product Innovation Management* (31:4), pp 814-831.
- West, J., and Dedrick, J. 2000. "Innovation and Control in Standards Architectures: The Rise and Fall of Japan's PC-98," *Information Systems Research* (11:2), pp 197-216.
- Yin, R. K. 2009. *Case study research: Design and methods*, (Sage).
- Yoo, Y., Henfridsson, O., and Lyytinen, K. 2010. "Research commentary-The new organizing logic of digital innovation: An agenda for information systems research," *Information Systems Research* (21:4), pp 724-735.