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Effectuation Logic in Digital Business Model Transformation: Insights from Japanese High-Tech Innovators

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Abstract

Purpose

The purpose of this paper is to study how digital business models evolve when entrepreneurs move to new digital platforms and how this evolution is related to effectuation and causation logics.

Design/methodology/approach

This study applies a multiple case study approach to investigate how digital business models change in small, Japanese high-tech firms providing their innovations through different digital platforms. To investigate digital business models, this study considers the elements that comprise general business models. The case firms were selected based on size, products, and transitions from physical to various digital platforms. Semi-structured interviews were conducted with the key decision-makers from the case firms.

Findings

The findings show that through digital transformation, the case firms' digital business models evolved by following effectuation logic as well as causal logic. All the firms employed causal logic when moving to new platforms, among other actions. The case firms used effectual logic with success for product development and adjustments to their network. Especially firms providing video games relied on effectuation for high impact products. Effectual logic did not play a role at all in changes to Value Delivery and had only little impact on revenue structures.

Originality/value

This research helps understand how digitalization of platforms and subsequent moves to newer digital platforms improve a firm by changing the business model elements through effectuation and causation logics. This research extends the understanding of digital business model transformation to a more granular level, business model elements.

Keywords: Effectuation, Causation, Digital platforms, Business Model, Transformation

1. Introduction

Digitalization of distribution platforms provides new entrepreneurial opportunities for firms delivering and multihoming their digital innovations and content through various platforms to end-users (Belleflamme and Toulemond, 2016). However, to reach opportunities created by digital distribution platforms¹, firms have to adjust their operations by adapting their business to digital environments. Especially, if a firm is operating with traditional delivery channels, this may include several changes to a firm's existing business model. That is, we know little about how digital business models of high-tech firms change and evolve over the time when these firms adapt new technologies and adjust their business models to new digital distribution platforms.

To better understand this phenomenon, we draw upon and integrate ideas from the entrepreneurship theories of causation and effectuation (Sarasvathy 2001, 2008) with business model literature (Cavalcante et al., 2011; Ojala, 2016a; Osterwalder et al., 2005; Teece, 2010; Zott and Amit, 2010). Within these two theories, causation focuses on planning and prediction whereas effectuation is related to creation of particular effect within means at hand (Read et al., 2009; Sarasvathy, 2001). These entrepreneurship theories can be applied to better understand how entrepreneurial opportunities emerge for new digital business models and how and under what conditions such opportunities lead to change in a business model (e.g., Ojala, 2016a, 2016b). These theories provide also a deeper understanding of the impact of entrepreneurial agency on a dynamic process where entrepreneurs act to find and adjust their business models to new environments. From the dynamic process point of view, scholars have studied business model evolution through resource re-combination (e.g., Achtenhagen et al., 2013; Demil and Lecocq, 2010) and entrepreneurial actions where entrepreneurs create and discover new opportunities (Ojala, 2016b). Even though previous works provide valuable insights to the topic, we still have meagre understanding of the decision-making logics behind business models change and evolution in a situation when a firm adapts to a new digital delivery platform for its innovations.

Based on the above discussion, the main research question asked by this paper is “How do digital business models evolve and what are the roles of effectuation and causation logics when entrepreneurs move to new digital distribution platforms?” In order to provide an answer to the research question, we conducted a multiple case study with four Japanese high-tech firms providing digital innovations. We aim to contribute business model and entrepreneurship literature by

¹ The term “digital distribution platform” refers here to subset of digital platforms that content providers can use to supply their products and services to end-users. Well known examples of digital distribution platforms are Google Play, App Store, Steam, PlayStation Store, Spotify, Netflix, etc.

integrating insights from effectuation theory to better understand how different elements of business models evolve based on effectual or causal logics.

2. Theoretical framework

In this chapter, we first introduce the ideas of our background theories, effectuation and causation logics. Thereafter, we talk about business models and how they might evolve over time. This is followed by the presentation of changes in five different elements of business models that we apply in this study to better understand change and evolution of business models. In the end, we discuss platforms, distribution platforms, and the concept of multihoming.

2.1. Effectuation and causation logics

Literature on entrepreneurship presents causation and effectuation (Sarasvathy, 2001, 2008) as opposing logics of decision-making that entrepreneurs follow as they act and react to changes in the market (Hauser et al., 2019; Hevner and Malgoude, 2019). These logics have been widely applied to study small and medium-sized enterprises (SMEs) in different contexts (see e.g., Chetty et al., 2015; Hauser et al., 2019) as within these firms, small groups typically lead decision making. Causation logic, referred also as a “predictive approach”, has its origin in economic theories and marketing schools where the aim is to predict the future while managing risk and surprises through good planning (Kotler, 1991; Read et al., 2009). That is, in causation logic, when an entrepreneur has a goal, he or she will focus on acquiring means that help to reach the goal (Sarasvathy, 2001). This kind of process includes detailed planning to reach the goals set by the entrepreneur, while helping to avoid or at least reduce surprises and risks in the market. In practice, this commonly requires a well-structured business plan that entrepreneurs follow to better predict competitors’ actions and changes in the business environment (see Chandler et al., 2011; Sarasvathy, 2008). Although planning might reduce risks related to the entrepreneur’s actions in the market, it might also limit possibilities for taking advantage of opportunities that emerge unexpectedly (cf. Sarasvathy, 2008).

In contrast, entrepreneurs who follow effectuation logic are open to surprises and they avoid overly strict planning (Read et al., 2009; Sarasvathy, 2001). In effectuation logic, entrepreneurs have a set of existing means and the focus is on choosing between different goals that can be reached with these means (Sarasvathy, 2001). Effectuation provides insights into how entrepreneurs make

decisions under uncertainty; therefore, it can be described as an essential aspect of entrepreneurial capability (Sarasvathy, 2001). Indeed, especially in the cases where the future is unpredictable, detailed planning becomes harder and the decision-making logic will more likely follow an effectual approach (Sarasvathy, 2001; Sarasvathy et al., 2013). This helps entrepreneurs to react fast to changing situations in the market and make speedy adjustments to their products and services based on unexpected competitor moves or unforeseeable development in technology (Ojala, 2016a). This seems to be particularly relevant in the case of digital technologies that develop fast and unpredictably, making it hard for entrepreneurs to foresee or control ways of action needed (Austin et al., 2011; Dattée et al., 2018; Nylén and Holmström, 2018). Although effectuation and causation logics represent rather opposite views, they can also exist in parallel (Read et al., 2009; Smolka et al., 2018).

2.2. Business models

Business models, that is, different descriptions of how firms create, capture, and deliver value, have been of scholarly interest for decades. When we take a closer look, the existing literature describes the concept of a business model in various ways. On a general level, business models can be seen as depictions of “stories that explain how enterprises work” (Magretta, 2002). Further, a business model represents interdependent activities above and beyond the focal firm that allows the firm to create value with its partners (Zott and Amit, 2010) describing how a firm and its partners create, market, and deliver that value to gain and sustain revenue (Osterwalder and Pigneur, 2013).

The extant literature on business models has greatly contributed to our knowledge of different elements and characteristics of business models (Baden-Fuller and Morgan, 2010; Osterwalder et al., 2005; Teece, 2010; Zott and Amit, 2010; Zott et al., 2011). Further, we have extensive knowledge how business models work in the field information systems (Clemons, 2009; Deodhar et al., 2012; Osterwalder and Pigneur, 2013) and in a firms’ global expansion (Khan and Fitzgerald, 2004; Ojala and Tyrväinen, 2006). The change aspect of business models has also attracted interest from several scholars (Bohnsack et al., 2014; Cavalcante et al., 2011; Demil and Lecocq, 2010; Ojala, 2016a; Saebi et al., 2017). Overall, we have an extensive amount of literature on business models from theory point of view (Zott et al., 2011) as well as how to apply business models in practice (Osterwalder and Pigneur, 2013).

Recently, researchers have put increasing attention to changes and evolution of business models (Bohnsack et al., 2014; Cavalcante et al., 2011; Demil and Lecocq, 2010). Especially in the fields

where digital technologies develop quickly and unpredictably (Nambisan, 2017; Ojala, 2016a), firms have to successfully adjust their business models to new technologies and environments. Hence, firms' success becomes reliant on their capabilities to configure resources (Amit and Han, 2017; Simon, 2011) and bring about changes in a firm's business model that is, in many cases, path dependent (Cavalcante et al., 2011) and subject to possibilities and boundaries set by existing technologies (Ojala, 2016a; Yoo et al., 2010). As the business model is a wide concept, we consider five different elements based on the previous literature to better understand the change and evolution aspects of business models.

2.3. Various elements of business models

Given the flexibility and imprecision of the concept of business model, it is necessary for researchers to define the key business model elements that are in line with the purpose of their study (Luoma, 2013). For this reason, we apply roughly the four business model elements introduced by Ojala (2016a) which are largely based on the business model pillars by Osterwalder et al. (2005). However, we integrate a fifth element, information flow, into the model. Based on previous studies (Timmers, 1998; Weill and Vitale, 2001), it plays an important role in binding other elements of the business model together. It also shows explicitly the changes that occur in firms' information exchange among the different business model elements. Accordingly, the key business model elements used in this study are explained below.

The first element, Product and/or Service, refers to a firm's innovation that it develops and markets, and the business logic behind it. This element explains how the innovation is related to other technologies in the market (Adomavicius et al., 2008; Arthur, 2009). In the case of digital distribution platforms, the innovation can be related to any of layers (content, service, network, or device) within the multilayered architecture of digital platforms (Yoo et al., 2010). The Product/Service element indicates how the firms' innovation provides value for the external partners, stakeholders, customers, etc. operating around the platform ecosystem (Al-Debei and Avison, 2010; Amit and Zott, 2001; Ojala and Helander, 2014; Osterwalder et al., 2005; Osterwalder and Pigneur, 2013).

Value Network, the second element, refers to the key actors within the ecosystem where the firm operates (Autio et al., 2017; Eaton et al., 2011; Tiwana, 2015). In order to operate successfully in a Value Network, a firm has to identify how the value of its offering might benefit other actors within the ecosystem around the platform. This value can be based on monetary or non-monetary value

(Walter et al., 2001). Further, a firm has to consider how they delivered the value so that it benefits as many actors as possible in the ecosystem (Allee, 2008; Ojala and Helander, 2014). Thereafter, it becomes possible evaluate how the other actors could add value to the firm's own offering. That is, partners within the ecosystem may provide different kinds of technologies, access to the interfaces and components, etc. enabling or supporting the firm's activities in the market (Adomavicius et al., 2008).

The third element, Value Delivery, covers how value is exchanged to the various partners and customers in the ecosystem (Ojala, 2016a). For instance, new digital technologies enable firms to create and adapt new and faster channels to deliver value to partners and end-users (Rayna and Striukova, 2016). This aspect is similar to networking as it should describe how a firm gets in contact with other actors within their ecosystem (Osterwalder et al., 2005; Osterwalder and Pigneur, 2013) and how value is exchanged with the firm's partners (Al-Debei and Avison, 2010; Osterwalder and Pigneur, 2010; Teece, 2010).

The fourth element, the Revenue Model, includes the processes through which a firm makes money by its actions in the market. In other words, this element explains how the value that a firm offers to its customers, partners, or other actors within the ecosystem, can generate financial revenue (Ojala, 2016a). Revenue Model has a central role in several works related to business models (Morris et al., 2005; Osterwalder et al., 2005; Osterwalder and Pigneur, 2010; Teece, 2010; Zott et al., 2011). Depending on a firm's strategy they may use subscription, one-time payment, or pay-per-use models for revenue with various pricing types (see e.g. Lehmann and Buxmann, 2009).

The last element, Information Flow, refers to the movement of intangible value packaged as information regardless of the route by which it travels among the partners and customers within the business model (Timmers, 1998). This information flow not only includes pushing of information from the focal firm towards its partners or customers, but also information that it receives from them and that it uses in a meaningful way to create value or to reassess the business model itself (Amit and Zott, 2001; Timmers, 1998). This element acts as a link among all the business model elements (Timmers, 1998; Weill and Vitale, 2001) allowing a firm to exchange information that is valuable to the network.

2.4. Digital Platforms

Digital platforms can be defined as extensible codebases where third parties add complementarities in the form of new modules and services (de Reuver et al., 2018; Eaton et al., 2011; Gawer, 2009).

Of interest to this paper are platforms that relate to digital products and services and which are used by several actors. Interaction between different actors has an important role in Bresnahan and Greenstein's (1999) definition of platforms as bundles of standardized elements that provide a framework for buyers and sellers to coordinate and covers physical platforms as well as digital ones. Neither party will be interested unless both parties participate. Regardless of physical or digital footprint, platforms are systems that enable two or multi-sided markets to interact (Rysman, 2009). Physical platforms have non-core features similar to digital platforms such as blocking users and shaping the behaviour of partners (Boudreau and Hagiu, 2009). This paper is mainly concerned with digital platforms that companies, users, and intermediaries coordinate around.

Loosely coupled multilayered architecture of digital platforms (Yoo et al., 2010) with standard interfaces enables firms to develop their content for different platforms that can be used to bring content available to different devices (Ojala and Lyytinen, 2018; Yoo et al., 2010). Digital distribution platforms (Cortimiglia et al., 2011; Diba and Wagner, 2015) have a critical role to firms providing content and related services for different platform. These platforms help content providers to reach a large number of potential customers easily and quickly (Cortimiglia et al., 2011; Diba and Wagner, 2015; Moore, 2009). Although firms operating platforms might have strict control regarding which devices the platform can be used (e.g. Apple controls and limits usage of its iOS platform only to Apple's products), content providers might seek to multihome their offering through several platforms. For example, videogame developers (Moore, 2009; Ojala and Lyytinen, 2018) or firms operating in the music industry (Waelbroeck, 2013) might look for several alternative platforms to multihome their content. That is, when multiple platforms can be used to carry the same content, multihoming has an important role to extend content providers' distribution possibilities (Rochet and Tirole, 2003) A firm might offer the content on multiple platforms and customers can use more than one device or network to access the same platform service (Tiwana, 2015). As a result, content can be offered across multiple platforms, and the same platform can be used to distribute and offer content from other content providers (Rochet and Tirole, 2003; Hyrynsalmi et al., 2016).

Platforms also connect different actors in an ecosystem (Tiwana, 2015). For example, when a video game is bought with a credit card, the payment platform brings together retailer and consumer while the gamer plays on another platform such as a console. Similarly, video game developers may place a game on multiple platforms such as an App store and Steam for PC environment, gaining additional markets through multihoming (Schreieck et al., 2016). Multihoming brings advantages to all sides of the market that the platform appeals to, for example, gamers, game publishers, advertisers,

and payment systems. While the adoption of digital platforms will surely impact on value delivery within a content provider's business model, movement to digital platforms from physical ones brings documented benefits to business models of technology firms (Baber et al., 2019).. However, we do not know much about these changes and related decision-making logics (cf. Ojala, 2016a).

3. Research method

This study chose qualitative method in order to understand the transition to digital distribution platforms and the evolution of the business model over time and the nature of such changes. That is, the research method guiding this study had to be suitable for understanding complex social phenomenon while providing an in-depth description of it in the context of a real-life environment over which the investigator has little or no control. According to these criteria, a qualitative multi-case study was selected (Yin, 2009). Instead of relying on a single-case study, multiple cases were selected not only to add general confidence to the findings but also as a way to gain deeper understanding and explanation of the observed phenomenon. That is, multiple instances of study help to understand how the specific conditions of each case findings may be related (Miles et al., 2014). The selected firms were chosen according to the following criteria: (i) The firms were SMEs (from 5 to 180 employees), which helped to gather information as the top managers were accessible to the researchers, (ii) the sample firms included established firms ranging from about 10 to 30 years old making it possible to study changes in business model in the course of time, (iii) the firms used several digital platforms to deliver product(s) and related services, and (iv) at least one representative from the strategic-level management of the firm was accessible to the researchers in order to facilitate access to key staff and information resources in the course of the interviews (Huber and Power, 1985). One firm was selected from a different niche in the software industry, making productivity software rather than video games in order to provide some contrast. The firms were reached through the first and second-degree networks of the authors. An overview of the case firms can be seen in Table 1. All the case firms were from Japan, where digital transformation has an important role due to the large size of the markets for different digital services (OECD, 2017).

Table 1. Overview of the selected firms

Firm	Year of establishment	Main activity	Headquarters location
A	1984	Specialized software development	Kyoto, Japan
B	1990	Videogame development	Kyoto, Japan
C	2001	Videogame development	Kyoto, Japan
D	2006	Videogame development	Tokyo, Japan

3.1. Data collection

To collect qualitative data for this study, semi-structured interviews were used for data gathering from expert sources (see Table 2). The interviews included mostly open questions inviting interviewees to recall past experiences (see Appendix A). A set of guiding questions opened discussions, but interview participants were informed that flexibility was appropriate and even necessary in the study. The interviews covered the following aspects: (i) The origins of the firm's distribution model and development of initial business model, (ii) changes made in the firm's distribution and business model as a reaction to new technologies or other triggers, (iii) confirmation of the current distribution and business model, and (iv) views on the envisioned future of the firm. While the questions covered common material, they were tailored to each case firm based on information from publicly available sources, such as websites. This information contained basic facts about establishment, size, business activity, products, and important events in the firm's history. Building the interview questions on this information provided a way to frame the conversation such that the firm was explored appropriately without missing important material. This approach also represented a tool for the time management of the interview since access to the informants was limited to one or two hours per session.

Interviews were held mostly in the case firms' headquarters, but also in more informal settings such as cafes or university offices. The interviews were conducted in English. Employees of the case firms helped to overcome a potential language barrier by translating comments made in Japanese by their colleagues. In the cases of Firm D and the most recent Firm C interview, a translator was hired for the session. During the interview sessions, all interview notes were in English; these were scanned and evaluated by the researchers.

The interviews were recorded and transcribed. Additional secondary information was gathered from firm brochures, news articles, and books. Further, news articles and old advertising material

from earlier stages of the companies were collected and used to confirm the consistency of the primary data in order to reduce retrospective bias (Huber and Power, 1985). Comparing this secondary information to the primary interview data made it possible to confirm the information and triangulate (Miles et al., 2014). Thereafter, representations of the business models were drafted as Value Network diagrams (see example in Ojala 2016a). In some instances, a Business Model Canvas was drafted and used to build diagrams. Follow-up confirmations of the collected data were conducted by email in order to confirm the data from interviews. Relevant data such as business model diagrams, tabularized data, and interview transcripts were shared with the representatives who confirmed or helped modify the information presented by the researchers. In follow-up interviews (firms B and C), specific questions were clarified, and questions missed in the initial interview were asked.

Table 2. List of interviews conducted

Firm	Date	Length	Title of the interviewee(s)
A	May 29, 2017	1.5 hours	President
	Oct 10, 2017	1.5 hours	President
B	June 16, 2017	2 hours	CFO Publishing producer
	September 16, 2017	1 hour	Publishing producer
	April 12, 2019	1 hour	CFO Publishing producer
C	August 9, 2017	2 hours	Senior Producer Creative Producer
	September 19, 2017	2 hours	Senior Producer
	April 15, 2019	2 hours	Senior Producer Studio Manager
D	November 6, 2017	1.5 hours	President

3.2. Data analysis

The method of data analysis was composed of three concurrent flows of activity, as recommended by Miles et al. (2014): (i) data condensation, (ii) data display and (iii) drawing and verifying conclusions. In data condensation, the collected data from both primary and secondary sources of information was

made concise for more manageable analysis. The interview transcripts provided the basis for chronological case narratives. Secondary sources enriched the narratives and verified data such as dates. In the data display activity, condensed data was transformed into tables and figures. In particular, graphic representations including wire diagrams with the elements of the business models of relevant stages of the case firm were built (see Figures 1 and 2 as an example). In some instances, a business model canvas was used as an intermediate step. While drawing and verifying conclusions, all relevant “patterns, explanations, causal flow and propositions” (Miles et al., 2014) were noted. This activity was not done once to draw final conclusions, rather, early conclusions were drawn and subsequently discarded, transformed or confirmed during the course of analysis. Moreover, conclusions regarding case firms were confirmed in follow-up interviews or email by the informants.

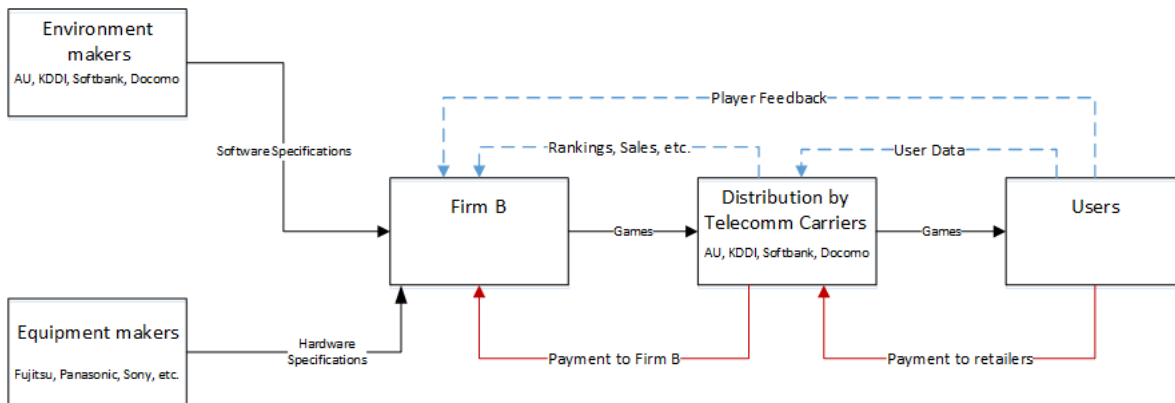


Figure 1. Business model of Firm B, 2001-2008

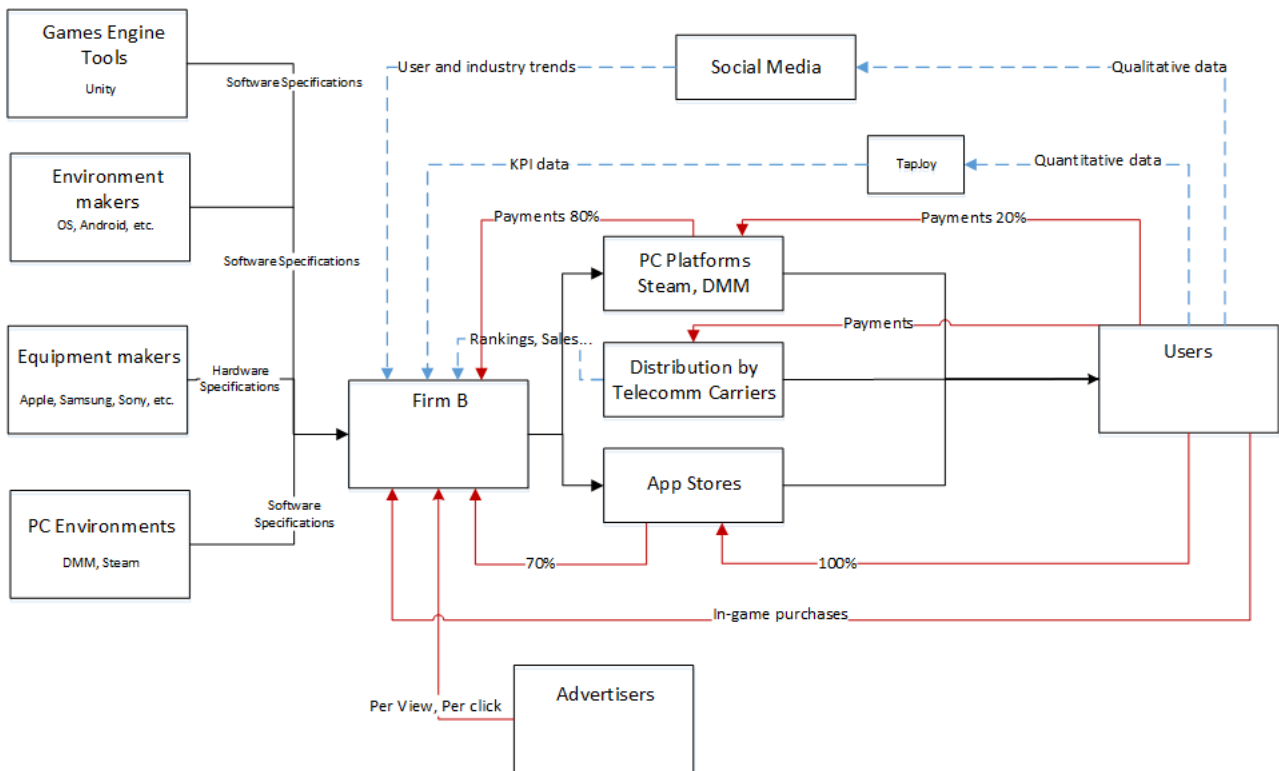


Figure 2. Business model of Firm B, 2009-2018

4. Research findings

This section includes narratives of each case firm. The narratives identify instances of effectuation versus causation in the five central elements associated with transformation of digital business models. A change to an element of a business model is considered causal if made with planning and specific predictions about benefits to the firm. Changes are considered effectual if they were made with unclear or omitted predictions about the benefits to the firm yet were nonetheless employed in business improvement. Other indications of effectual logic include opportunistic exploitation of surprises, co-innovating with value partners, risk taking with resources, etc. (Sarasvathy, 2001). The various logics of changes in the case firms' digital business model elements are elaborated in Table 3.

4.1. Firm A

Firm A was founded in 1984. The product element of the business model began when an opportunity was exploited by the entrepreneur: a computer product for Japanese ideograms, or kanji, which was needed for word processing. The opportunity was clear to the entrepreneur "...the market was so immature at the time... It was still a completely wide-open market". And thus the product was bought in order to exploit that market gap, a causal logic move. The subsequent success made it possible to create advantageous deals with publishers as well as with an association of national universities in Japan.

The firm developed a second software package and acquired a word processor. The Product element move was intended to exploit a market opportunity based on a high margin packaged software business model, an example of causation. The firm then bought a font company and related font sets from different firms and further engineered them for use with the alphabets of East-European languages and ideograms of Asian languages. The font library was licensed to customers such as major game makers and vendors of embedded systems and distributed physically. Broad awareness of the industry and its environment led the entrepreneur of Firm A to plan these moves.

The current main development effort draws in various sorts of data with broad parameters in the hope that it will be useful for an artificial intelligence (AI) product. Firm A's founder now feels under pressure to create that product and position it within the industry. He underlined the challenge of foreseeing and developing a new product with available resources saying "We have no idea how to do that. No idea. At night time I dream about 'how are we gonna do that?'" Operating within its resources and Value Network to create a product under uncertain market conditions makes this an effectual logic move.

The firm later transformed its Value Network in order to gain intended advantages: it simplified the network by bringing firms and products in-house as it developed and expanded the product packages acquired earlier in its history. In more recent years, the firm expanded its Value Network and Value Distribution by adding a key outsourced supplier in China for development and the Apple App store. The changes identified are examples of causation, based as they were on planning and intentional extension and sometimes abandonment of items.

With improvements in internet infrastructure and technology, Firm A made a Value Delivery element move from conventional shipping of physical media to delivering updates and order taking online, targeting cost reductions. Customers needing physical products can nonetheless still request

USB drives or CDs. Firm A added the Apple App Store to the Revenue Model by 2010, yet the sales volume did not make up for the commission fee. This causal logic move was intended to add customers and raise revenue. Because the move failed to raise revenues, the firm now uses the platform only for free products in order to raise their profile. Thus the reaction to the failure was to make an effectual move undertaken without specific insights about the impact it might have. In these ways, the firm added new sources of data, their webpage and App Store, to learn about customers in ways they had not expected but could use to improve firm performance.

4.2. Firm B

Firm B started operations in 1990 following the desire of the founder to create video games and move the firm he inherited out of a wholly unrelated field, precision machining. With no personal experience in the videogame industry and armed mainly with a vision, the founder took the high risk, effectual logic move of recruiting a small inexperienced team to develop games for consoles. Games were created and delivered to retailers and very little information beyond the number of units sold flowed from users to the firm. Predictions about sales and acceptance of games were not possible. In addition to unpredictability, the resources, time, hardware, and software skills needed, remained high and the entire business model remained subject to risky, unreliable returns and competition from large studios.

The founder undertook in 2001 another high risk, radical business model transformation by making games for feature phones. Devices of this sort had become increasingly widespread as was game playing on them. Entering this market successfully meant lower risk in the long term, and lower commitment of resources regarding product development. With regard to Value Delivery, the benefits included speedier inflow of cash and more data which came directly from users. Thus, the firm was accordingly better able to make incremental improvements to games. Products changed again in 2009, shifting to touch screen phones, which allowed easier access to more customers through online, carrier agnostic distribution platforms such as Apple App Store and Google Play Store. The continuing success of one game improved the predictability of the overall operations and finances of the firm. Nonetheless, uptake of new games remains unpredictable and a 2018 restructuring saw the closing of two internal studios plus the opening of a new unit to import and localize foreign games that seem suitable for Japan. Inflow of information has improved in granularity and volume with each move to a new digital platform. Development costs have shifted from emphasis on technology to human talent. The previous subscription based Revenue Model changed to a free-to-play model with

in-game purchases and in-game advertising. The Value Network of the business model now includes a new partner that is jointly investing in co-creation of a new game product. This effectual logic opportunity, though lower risk than in-house game development, was grasped opportunistically after failure of a joint project with that partner.

The transformed business model as of this writing employs multiple mobile digital platforms which provide several pathways for user information. Meanwhile, an increasingly large group of employees scan the horizon for new opportunities. All five of the business model elements have been improved and the firm continues to grow, adding employees.

4.3. Firm C

Firm C started operations in 2001 with a simple business model that satisfied a sole corporate customer. The products for that customer were developed cooperatively and provided a competitive edge to that customer. The firm expanded its products to include games because these were a heartfelt goal and vision of the founder. There was little ability of prediction in the firm that would allow them to create successful games. Nonetheless, Firm C pursued effectual logic by using its meagre existing resources to enter the mass market, not knowing what the future would bring.

Conventional industry marketing events, such as E3, were costly to a small firm and disruptive. The transformation from conventional marketing to digital platforms allowed the firm to recover resources such as worker hours lost to planning and travel while increasing cost efficiency of operations. Moving marketing efforts to digital platforms was as advantageous as the firm expected, an example of causal logic. The platform moves improved delivery of products to customers and brought richer feedback from end users. In 2012, Firm C founded an industry event for independent game studios and players not knowing the impact it might have. The event, held annually since then, has increased Firm C's exposure among independent studios, critics, and gamers as intended. At the same time, it was expected generally to create a new flow of information about the market as well as a source of business partners that could be exploited effectually and opportunistically. As the firm developed the event, it ceased participating in major trade shows which did not bring clear benefits.

Firm C expanded its Value Network adding not only face-to-face contacts through the trade show just mentioned, but also adding on-line platforms such as Steam. These platforms allowed expanded delivery of value as well as improved predictability of product performance. The firm multihomed products on various platforms calculating that some would be profitable. These moves

added revenue streams to the firm. Ultimately, game uptake is inherently hard to predict as the ultimate decision to play or not is beyond the control of the firm. The firm prefers to design games for broad audiences rather than niches based on the effectual thinking that narrowly targeted games may miss market segments entirely and that broadly targeted games are more likely to find the right players. Transformation of each element of the business model has contributed to improvement of the firm.

4.4. Firm D

Firm D was founded in 2006 when the founder and CEO left his employer and took on the high risk of starting a firm in order to exercise greater creativity, and develop games, than had been possible as an employee. The first business model however was as an outsourcing supplier to established large companies, the creating and publishing of games came a few years later. A breakthrough came in the co-development of a hit product with a large client. Firm D was initially hired for technical support but came to play a core role in development of the game. This success soon led to expansion of the Value Network with a similarly cooperative development role with a major foreign player and then a partnership with yet another foreign leading company which led to ongoing royalty payments. This last partnership was achieved by effectuating their existing contacts to gain a personal introduction to the client firm. This new stream of income was conserved in order to fund the firm's first own title on Xbox in 2012, effectuating in-house resources to create a new product they would wholly own and transforming the business model. This first game fulfilled the founder's driving vision of game development. Not all games have been successful, for example a game for building dating skills among young people was withdrawn even after gaining positive news coverage. Meanwhile, the firm simplified its supplier network by creating its own technologies to improve and replace the standard software development kits from major publishers. This effectual logic move required building up an expensive knowledge base in the hope that it would lead to higher quality work, greater competitiveness, and better profits. Despite the cost and unpredictable benefits, the firm eventually gained technical ability and greater speed in product development. Revenue sources and Value Delivery improved predictably with multihoming, causal logic moves of products to various platforms including App Store and Android in 2013 and Play Station in 2014. Information flows have become richer since the firm began publishing games owing to the greater variety and volume of data about user experience, playing habits, purchasing preferences, and so on returning to the firm from digital platforms. Additionally, they conduct increasing work for client videogame companies and

these provide industry insights that cannot be gotten from players. The Value Delivery, Revenue, Information Flow elements followed causal logic only, riskier effectuation moves appeared only regarding Products/Services and Value Network.

Table 3. Examples of Effectuation and Causation in Elements of Digital Business Models

Business model element	Firm A	Firm B	Firm C	Firm D
Product/Service Causation	-Acquired products with customer market in mind	-Became able to make incremental predictable improvements to some products	-Became able to make incremental predictable improvements to some products	-No apparent examples
Product/Service Effectuation	-Developing AI based products with no confirmed market	-Developed own games without confirmed market -Took high risk moves to maximize own freedom and creativity -Seized unexpected opportunity to develop popular IP with partner	-Co-created skills with customer -Developed own games without confirmed market -Took high risk moves to maximize own freedom and creativity	-Co-created game logic and other technical skills with customer -Developed own games without confirmed market -Took high risk moves to maximize own freedom and creativity -Inventoried resources
Value Network Causation	-Acquired firms and products with clear outcomes -Added partner (OEM) to improve product with specific benefits	-Abandoned physical distribution -Included new suppliers to deliver specific benefits	-Abandoned major trade shows due to poor benefits -Included new suppliers to deliver specific benefits	-Included new suppliers to deliver specific benefits
Value Network Effectuation	-Included App Store as partner to raise awareness	-No apparent examples	-Included mass market users without predictable uptake information -Included and excluded partners based on co-creative compatibility	-Moved key technology in-house, cutting suppliers -Used diffuse personal contacts to reach major customer
Value Delivery Causation	-Abandoned most physical distribution -Relies on channel partner to maintain customer network	-Multihomed online distribution to digital platforms with low risk -Chose to develop for new platforms	-Physical distribution enhanced with e-communication -Multihomed online distribution to digital platforms with low risk -Chose to develop for new platforms seen as low risk	-Physical distribution enhanced with e-communication -Multihomed online distribution to digital platforms with low risk -Chose to develop for new platforms seen as low risk
Value Delivery Effectuation	-No apparent examples	-No apparent examples	-No apparent examples	-No apparent examples
Revenue Model Causation	-Reduced back office costs using much lower cost 3 rd party platform -Added and App Store as revenue source knowing the revenue structure	-Included advertisers, in-app payments with more predictable revenue and data -Conformed to changes standard in the industry	-Accessed new customers in well understood market segments -Direct sales and in-app purchases with more predictable revenue and data -Chose partners able to increase revenue	-Accessed new customers in well understood market segments -In-app purchases with more predictable revenue and data
Revenue Model Effectuation	-Limited App Store to free products	-No apparent examples	-No apparent examples	-No apparent examples

Information Flow Causation	No apparent examples	-Moved from minimal and manual to high detail, faster, and automated -Moved to digital platforms to gain direct info from users	-Moved to digital platforms to gain direct info from users -Developed physical interaction with users	-Moved to digital platforms to gain direct info from users
Information flow Effectuation	-Gained faster responses from customers through online distribution -Gathering large-scale data for AI product	-Launched unexpectedly successful new events for users hoping to gain insights and players	-Developed new sources of industry information	-No apparent examples

5. Cross-case analysis

The case findings allow us to address the research question posed in the introduction: “How do digital business models evolve when entrepreneurs move to new digital distribution platforms?” Applying the business model framework of five elements as seen in Table 3, which presents specific examples of causation and effectuation that appeared in the cases. We can see that effectuation logic impacted many of the elements as the case firms’ business models improved over the years. The discussion below touches on each element of the business model and with Table 3 may help guide researchers toward promising new study topics while directing practitioners toward moves they might evaluate for implementation.

Developments in the Product/Service element included firms bringing new products to market and abandoning existing ones as new platforms were accessed. Each of the case firms showed effectuation logic changes to products and services, such as seeking new products with no promise of markets, co-development with customers, and maximizing their creativity. Still, some Product/Service-related moves, such as those from physical to digital and then to newer digital platforms, product or company acquisitions were planned choices based on predictions about outcomes. Thus, causation logic was used in moves where the firms were able to estimate risks beforehand, such as the first products and services created by Firm A, a consumer software firm. However, the creation of the first games and most gaming products and services by firms B, C, and D was routinely accomplished under conditions of risk and uncertainty. Most of the new products in the video game firms, especially those with major psychological or revenue impact, were created while the leader of the firm was under pressure and facing a challenge. Additionally, these product effectuation moves happened because of that person’s strong vision. Thus, effectuation logic has been constantly in play for these firms regarding expansion of product and services.

The moves that case firms made regarding their Value Networks followed mainly causal logic predicting an outcome and achieving it. Three of the case firms (A, C, and D) nonetheless made moderately risky moves with unforeseeable outcomes. These included distributing free products through the Apple App Store hoping to excite awareness, accepting or rejecting partners based on perceived compatibility for product co-creation, and pruning the network by cutting out technology suppliers and re-engineering that technology in-house.

Regarding Value Delivery, moves to digital platforms from physical platforms and thereafter moves to additional digital platforms by case firms had radical impact on speed of product delivery and product development. Not one of the four case firms in their combined nine decades of operation made changes to the Value Delivery element of the business model based on effectual logic. The interviews suggest that choices regarding delivery of value appeared before the case firms with starkly clear causal logic and they reacted accordingly to seize the benefits of new platforms or avoid losses associated with non-participation.

The case firms adjusted their Revenue Models drastically with conventional predictive causal thinking triggered by cost and income concerns. For example, such moves included moving from various in-house systems to a digital platform by outsourcing all back office operations to Amazon, adding in-app purchases, and increasing advertising. Effectual logic in Revenue Model changes included providing free product through the Apple App Store rather than for-fee products in hopes of indirectly driving buyers to Firm A's own website. For Firm B, faster payments were an unexpected and welcome benefit to the wellbeing of the firm, but not a targeted goal of any form of logic.

Three of the four case firms (firms B, C, and D) showed conventional causation logic planning as they improved movement of information from distributors and end users, first through the move from physical to digital platforms then when moving to other digital platforms. Information Flow generally improved with moves to new technology and platforms. Firm B, however, explained that they do not take in the maximum possible data available from the platforms it uses – they believe they have now selected and receive only the data most useful to product development and have thus eliminated noise and improved their focus. Following effectual logic, firms A and C developed data that did not have immediate apparent use. In the case of Firm A, this means very large yet granular datasets about user behavior that may be useful for an AI based next-generation application. The product, its functions, and its market remain unclear and unpredictable. Through its face-to-face industry event, Firm C brought in additional amorphous data, digital and non-digital, that is difficult to categorize and which may apply to numerous aspects of the business.

6. Discussion and conclusions

This qualitative case study makes notable contributions to the business model and entrepreneurship literature in the context of digital innovation providers. Firstly, effectuation logic appears to have the most impact in the Product/Service element of digital business models as many of these moves fulfilled visionary goals and opened new areas of digital business. Successful moves often come about because the founders were under pressure to transform the firm toward more digital business or fulfill their own vision of possibilities enabled by digital technologies (see e.g., Yoo et al., 2010). This finding reveals the important role of effectuation in digital business model evolution related to fast and unpredictably changing digital technologies (cf. Austin et al., 2012; Dattée et al., 2018; Nylén and Holmström, 2018) where the outcome of the move is uncertain (cf. Sarasvathy, 2001, 2008). As the findings of this study reveal, the gaming firms (B, C, and D) relied on effectuation logic for their most impactful products and for games in general (cf. Smolka et al., 2018) whereas Firm A followed effectuation logic only rarely, and not at all for its initial products and services. For entrepreneurship literature, the findings indicate differences in decision-making logics among digital innovators. This calls for more in-depth comparative studies on decision-making logics and specific reasons behind these logics in various industries creating digital innovations.

Secondly, in the Value Delivery element, causation logic had the main role. As digital delivery channels provided reliable replacement of physical channels with low risk, the transformations were easy to plan and predict in advance (cf. Read et al., 2009). It also seems that the maturity of the digital technologies impacts the decision-making. Most of the case firms' moves were to well-established digital platforms with standard interfaces (cf. Tiwana, 2015; Yoo et al., 2010) in the market. The situation would have been quite different if these platforms had been in the early stage of their development (cf. Ojala and Lyytinen, 2018), making the move riskier. Thus, predictive, causal logic has a stronger role when technologies are mature and have become more predictable.

Thirdly, transformations in most of the business model elements, excluding Value Delivery, included insights from both decision-making logics indicating that these logics work, in many cases, in parallel (cf. Read et al., 2009). This finding indicates that even though effectuation has an important role in one business model element, causation logic might dominate another element. Consequently, it seems that firms do not hold strictly to one logic in their decision-making and the decision-making logic depends on a firm's situation in the market and the goal of the decision. This finding builds on previous work by Smolka et al. (2018) indicating the importance of effectuation related to the specific

product aspects of the business model whereas planning (causation) facilitates entrepreneurs to draw more general directions for business model transformation.

The findings of this research offer several implications for managers of digital businesses. Because of the unbounded nature of digital technology (Nylén and Holmström, 2018), effectuation logic seems to work best in the case of exploiting creative means to gain powerful new products and services when conditions of development are unclear. That is, entrepreneurs cannot always know beforehand how the technology used with their products and services will evolve and how the digital artifacts they create will be used in the market (cf. Yoo, 2012). This uncertainty makes strict planning difficult and calls for means-oriented action and openness to create new business opportunities (cf. Read et al., 2009). Managers may implement Value Network moves and improve Value Delivery using either or both logics depending on clarity of benefits to be gained from allies. The good reputation of possible partners makes it easier to plan and join new networks without risks. However, reputable partners may exercise strong negotiation power over the small content providers, thus decreasing potential revenue. Alternatively, new, less reputable partners in the market may open new opportunities with more equal relationships but might present higher risk. With regard to Revenue structures, managers may do well to follow causal logic taking actions that are clearly understood as in many cases, revenue structures are well standardized. However, if managers are innovative, they might use effectuation logic to create new revenue streams enabled by digital technologies such as selling third party services, enticing new customer segments, or offering electronic vouchers and in-app transactions. While Information Flow may improve through moves in other business model elements, managers can target this directly. High risk moves with unclear goals may have good pay offs and managers should not neglect human interactions even as they concentrate on digital platforms. Human interaction produced key benefits for Firms A, B, and C even years after founding. Generally, to increase growth and survivability, managers should balance the use of effectuation and causation logics by considering their resources and strategic goals regarding new or enhanced in house abilities.

Overall, the findings about the business model elements and their evolution related to entrepreneurial decision-making logics provide a clearer picture of the origin and evolution of changes to digital business models. From an entrepreneurship point of view, the findings contribute to our understanding of digital innovators' business model changes based on various decisions when they move from physical distribution channels to digital distribution platforms. Although the change and evolution aspects of the business models (Bohnsack et al., 2014; Demil and Lecocq, 2010; Ojala,

2016a) have attracted increasing interest, to the best of our knowledge, this is the first systematic study aiming to reveal how effectuation and causation logics impact the elements of digital business models. Finally, this study focused solely on forming a deeper understanding of the phenomenon in the context of video game and specialized software developers providing content through digital distribution channels. That is, the findings of this study cannot be fully generalized to other industries or entrepreneurial opportunities enabled by digitalization. This calls for more studies in other contexts related to effectuation and causation logics in business model transformation.

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Appendix A. A set of guiding questions.

After briefly verifying the basic data related to date of starting operations, suppliers, customers, finance mode (bank, bootstrap etc.), description of business, we applied the following set of guiding questions:

1. How did the business start? Partners? Opportunities or passion or both?
2. How did the background of founders influence the initial business model?
3. Challenges starting (financing, competition, international issues), if any.
4. Initial government support, if any?
5. Who were the initial customers and suppliers?
6. Have the customers and suppliers changed over time?
7. How has competition changed over time?
8. How has the product line evolved over time?
9. How has the organizational structure changed over time?
10. How have changes in technology influenced the business?
11. Has the industry changed favorably or unfavorably?

Additional questions followed these, including some customized to the case firm.