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Digitalization and evolution of business model pathways among Japanese software SMEs

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Abstract

This chapter analyzes five Japanese software small and medium-sized enterprises (SMEs) to better understand how their decision-making pathways inside the organization evolve as they develop new business models. Event-state mapping method was applied to analyze the business model pathways of the case firms. We found that once triggered, pathways included various actors and a series of steps until an outcome, the new business model, was reached. The findings indicate that the decision pathways to new models became increasingly complex over the years and the number of individuals and teams involved increases as business model evolved further.

Keywords: Japan, Digitalization, Video gaming, Platform, Business model

1.0 Introduction

Business models have been a subject of scholarly interest for decades. Publications in recent years have helped to define the aim and elements of business models. The aim can include analyses, communication, management of strategy (Al-Debei & Avison, 2010), organizational design (Casadesus-Masanell & Ricart, 2011), and value capturing (Chesbrough & Rosenbloom, 2002). Other publications have contributed to our knowledge of basic elements and characteristics of business models (Baden-Fuller & Morgan, 2010; Osterwalder et al., 2005; Teece, 2007; Zott & Amit, 2010; Zott et al., 2011), business models in information systems (Clemons, 2009; Deodhar et al., 2012; Osterwalder, Pigneur, & Clark, 2010; Rajala & Westerlund, 2007), and business models in a firms' global expansion (Khan & Fitzgerald, 2014; Ojala & Tyrväinen, 2007). Furthermore, literature discusses the evolution of business models (Baber et al., 2019; Bohnsack et al., 2014; Demil & Lecocq, 2010; Ojala, 2016a; Saebi et al., 2017; Velu, 2017) and the importance of business models to economic outcomes (Chesbrough, 2007, 2010; Pateli & Giaglis, 2005). However, the mechanisms of evolution and change contributing to a firm's business models have received much less attention (Nambisan, 2017; Ojala, 2016b; Veit et al., 2014) although clarification of these mechanisms could improve understanding of decision making when innovating and adjusting business models.

Existing studies have mainly applied dynamic capabilities (Achtenhagen et al., 2013; Demil & Lecocq, 2010; Teece, 2010; Velu, 2017) or entrepreneurship theories (Ojala, 2016a) to explain business model evolution. Dynamic capabilities can be used to understand how a firm's resources should be allocated in the changing environment (Teece, 2007; Zollo & Winter, 2002) when a firm brings new products to market and evolves its business model further (Velu, 2017). Entrepreneurship theories, especially opportunity creation (Alvarez & Barney, 2007) and effectuation (Sarasvathy, 2001, 2008) as well as initial business model development as a process (Najmaei, 2016) provide deeper understanding of entrepreneurial actions when a firm seeks a sustainable business model (Ojala, 2016a). Prior research on small technology firms has

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shown a cyclical process of development and reassessment leading to change of business models (Ojala, 2016a). However, these theories create only an abstract understanding of triggers and conditions that lead to new business models.

Digital products and related ecosystems may develop unpredictably making firms' business models less stable and encouraging constant change (Nambisan, 2017). Theories on organizational change can be applied to better understand changes in a firm's business model. These theories describe sequenced stages of change ranging from the broadly descriptive freeze-unfreeze-refreeze process (Lewin, 1947) to precisely prescriptive models (Bhagat et al., 2012; Huse, 1980; Kotter, 2012). This chapter employs a powerful tool, event-state mapping (Miles et al., 2018), to look into those high level stages and conceptualize changes in evolution processes of business models. Based on the above discussion, we are especially interested in: *What the processes for developing a new business model look like inside a technology SME and how the processes evolve over time.* We study this phenomenon by conducting qualitative case study including five Japanese technology SMEs.

2.0 Business models and organizational change

The term "business model" refers to a description of the activities and organization of a business (Osterwalder et al., 2010). A model can appear explicated in written format as well as in block formats such as the Business Model Canvas (Osterwalder et al., 2010) or in other graphical formats (Al-Debei & Avison, 2010) such as wiring diagrams. The components of a business model have been summarized as including revenue logic, value proposition, activities, value network, organizational structure, information flow, partnerships, and communication among others (Chesbrough, 2007; Luoma, 2013; Pateli & Giaglis, 2005; Zott et al., 2011).

The business models are rarely stable (Ojala, 2016a) as changes in the environment, markets, technologies, policies, etc. challenge existing business models and push firms to adjust their business models based on these changes. That is, changes in the business models lead to changes in an organization structure. In organization literature, organizational change is understood in terms of stages (Lewin, 1947) which show aggregated blocks of activities (Weske, 2012). The stages of these models represent a process overview. Academic discussion of the overview stages links change to triggers but does not link the processes as pathways among events and people from the trigger to the goal of an adjusted or new business model. Business model is, however, linked to organizational change as developing or adjusting a new business model means important change to the organization (Pateli & Giaglis, 2005).

Organizational change has been categorized as episodic change or as various incremental changes. However, the difference may be unclear because macro level appearances may seem to be episodic but micro level viewpoints may show incremental ongoing change (Standing & Mattsson, 2016; Weick & Quinn, 2004). While the processes are clear at the macro stage level within the broad unfreeze stage (Lewin, 1947),and widely researched at the micro level of decision making, the processes at the middle "meso" level within those aggregated blocks activities remain unclear, as shown in Figure 1 below. That is, we must consider decision making inside of organizations in order to understand how decisions around business models are made.

At the more granular level of individual actors, the notion of bounded rational actors meaning individuals and groups with imperfect knowledge and resources attempting to make rational decisions (Simon, 1979). The firms and actors make iterative efforts including digressions (Mintzberg et al., 1976). Nonetheless, actors process information in order to make sense (Weick, 1995). That is, we define actors as individuals

or small groups inside a firm that appear as bounded rational actors who face uncertainty, limited resources, and incomplete information as they complete sensemaking activities.

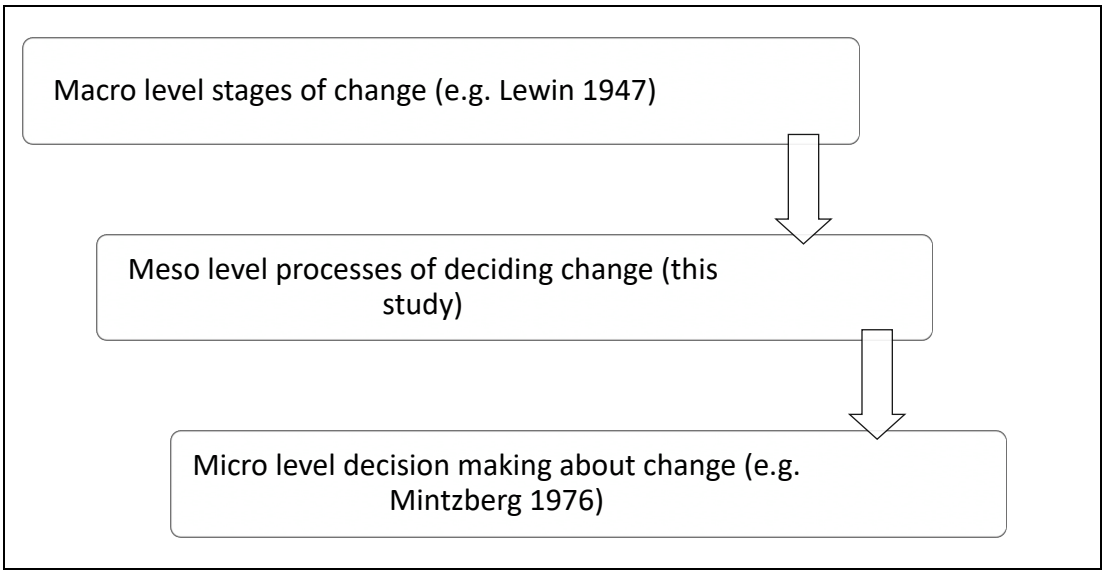

Figure 1: Focus of the Research

To better understand the meso level activities, we employ process tracing (George & Bennett, 2005) to confirm processes based on actors and their activities. Process tracing attempts to connect input with output through reasons (Gerring, 2006) as it seeks out and interprets diagnostic information about a state (Collier, 2011). Diagnostic evidence refers to conceptual frameworks, recurring empirical regularities, a hypothesis connecting those regularities, and an explanatory model about the meaning of the first theory (Collier, 2011). Process tracing is generally applied tool for identifying causality in a firm's behavior (Gerring, 2006) as processes, causality, and models found may add up to causal pathways (Gerring, 2006). In this chapter, we use event-state mapping (Miles et al., 2018), a specific process tracing method, explained in the methodology section.

3.0 Methodology

A qualitative multi-case study approach was selected for understanding complex social phenomena and describing it them the context of a real-life environment over which the investigator has little or no control (Yin, 2013).

3.1. Case Selection

Regarding case selection, "polar types" of cases are included, especially important because of the small sample size (Eisenhardt and Graebner 2007; Pettigrew 1990). Thus, the selected firms were chosen according to the following criteria: (i) The firm was classified as SME according to the definition of the Japanese Ministry of Industry and Trade (METI) (*2017 White Paper on Small Enterprises in Japan*, 2017), (ii) the sample firms included relatively young as well as old companies based on their date of establishment, (iii) the firm used digital information technologies as the main element of its core business activity, (iv) at least one representative from the strategic-level management of the firm was accessible to the researcher in order to facilitate access to key staff and information resources in the course of the interviews (Huber & Power, 1985). An overview of the selected firms can be seen in Table 1.

Firm	Year of establishment	Number of employees	Main activity	Headquarters location
Firm A	1984	8	Customized software development	Kyoto
Firm B	1990	100	Videogame development	Kyoto
Firm C	1984	132	Customized software development	Tokyo
Firm D	2001	42	Videogame development	Kyoto
Firm E	2006	130	Videogame development	Tokyo

Table 1: Overview of the selected firms

3.2. Data collection

For the purpose of the data collection process of this study, interviews were conducted to gathering qualitative data from expert sources (Table 2). We used first open, guiding questions to open discussion and inviting respondents to recall past experiences. Thereafter, we moved semi-structured interviews, covering the following aspects: (i) The origins of the firm and development of initial business model, (ii) changes made in the firm's business model as a reaction to new technologies or competition, (iii) confirmation of the current business model, and (iv) request for views or comments on the envisioned future business model for the firm. While these topics covered common aspects, the questions were tailored to each case firm based on an initial data gathering from publicly available sources, like a firm's websites.

Company	Date	Length	Company representative role
Firm A	May 29, 2017	1.5 hours	President
	Oct 10, 2017	1.5 hours	President
Firm B	June 16, 2017	2 hours	CFO and Publishing producer
	September 16, 2017	1 hour	Publishing producer
Firm C	August 4, 2017	1 hour	Chairman (former CEO)
	September 13, 2017	1 hour	Chairman (former CEO)
Firm D	August 9, 2017	2 hours	Senior Producer Creative Producer
	September 19, 2017	2 hours	Senior Producer
Firm E	November 6, 2017	1.5 hours	President & Representative Director

Table 2: List of interviews conducted

The interviews were conducted in English. In some instances, employees belonging to the case firm being interviewed helped to overcome a potential language barrier by translating comments made in Japanese by their colleagues. In the case of Firm E, a Japanese-English translator was hired for the interview session. During the interview sessions, all notes taken by the author leading the interview were written in English. Follow-up interviews were arranged and conducted with the case firms (except Firm E due to time limitations) in order to confirm the data collection from the first interview round. The audio of the interviews was recorded and subsequently transcribed. Additional sources of information arrived in the form of company brochures, news articles and books. Comparing this secondary information to the primary interview data made it possible to confirm the information (Miles et al., 2018). Secondary information was also used to confirm the consistency of the primary data and to reduce retrospective bias (Huber & Power, 1985).

3.3. Analysis of the data

We applied Event-state mapping analysis (Miles et al., 2018) as it provides insight into social processes by charting the pathways of steps in a process. Contrasting the changes in pathways as they develop over the time helped to shed light on deeper changes in the process and the activities of the managers. Unlike process tracing (George & Bennett, 2005; Gerring, 2006; Tansey, 2007), event state mapping identifies steps that are, in part, uniformly present among the situations analyzed while allowing for particular customization for each organization or situation. Process tracing however relies on interpretive history which may allow errors to arise (Welch et al., 2011).

In order to create event-state networks, pathway modeling was used. According to the pathway model methodology, all connections among nodes are possible, however not all will be in play (Myles & Brown, 2004). Connections among nodes that are not supported by the direct evidence of interviews and indirect evidence of information such as media reports are removed from the universe of potential connections. The remaining pathways are necessarily those actually used. In the analysis, the idea was to select events from a narrative based on their importance to subsequent events through causation or dependency while identifying the important states of that context (Maybury, 1995). Dependency means that subsequent events will not occur without the event in question. State refers to the situational context, such as alert, mission ended, or refueling. By following this theory, we built event-state networks to represent mental models of change processes for each of the case firms. The mental models were converted to graphic depictions showing the actors and sequence of events from trigger to process activities that resulted in a new or adjusted business model.

The nodes in the pathway models were derived from the empirical material collected. To create a pathway model, a table of four columns, triggers, actors, actions, and goals was made, a variation on the Inputs, Activities, Outputs, and Goals (see Trochim et al., 2016). Triggers are necessarily the first action in the sequence. These can be a variety of events inside the business, within the industry, or in society and the world in general. Triggers in this investigation do not indicate a root cause, merely the immediate trigger leading to action. Consideration by actors refers to evaluation, whether quick and intuitive or slow and methodical (Kahneman, 2011), and identifies the person or group involved i.e. founders, managers, boards, and staff. Steps refers to agglomerated activities such as reviews, training, research, and so on that actors might take. In this project, the Goals Achieved are business models, either a short term, draft model or the final model (Figure 2).

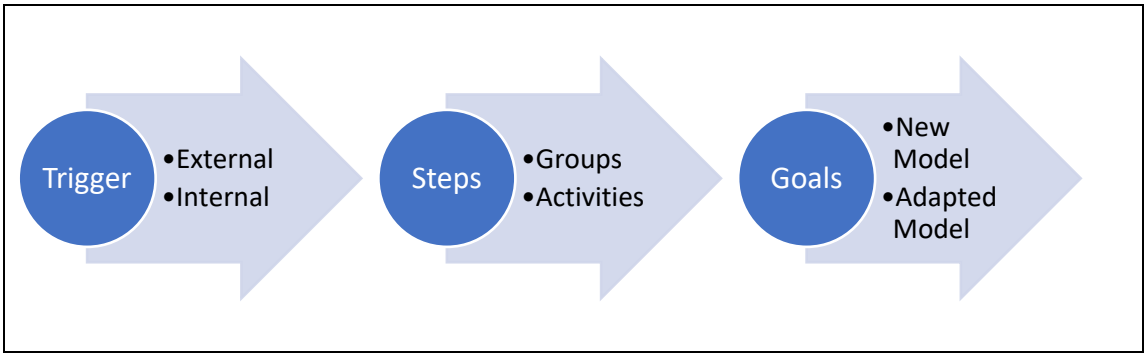

Figure 2: Abstract event state – model applied in this study

The edges between nodes indicate sequence using arrows to show which chronologically leads to the next. The trigger will always be the first item in the sequence and the goal will be the last. Generally speaking, the sequence is linear from trigger to goal, but may not be linear regarding the actors and their actions. For example, among actors and actions, the sequence may zigzag, move vertically, or occur simultaneously. Multiple triggers are also possible; these need not be mutually exclusive. The Figure 3 shows how the data was analyzed creating an event-state map. Event-state maps were created for all companies. The figure below shows paths belonging to Firm B.

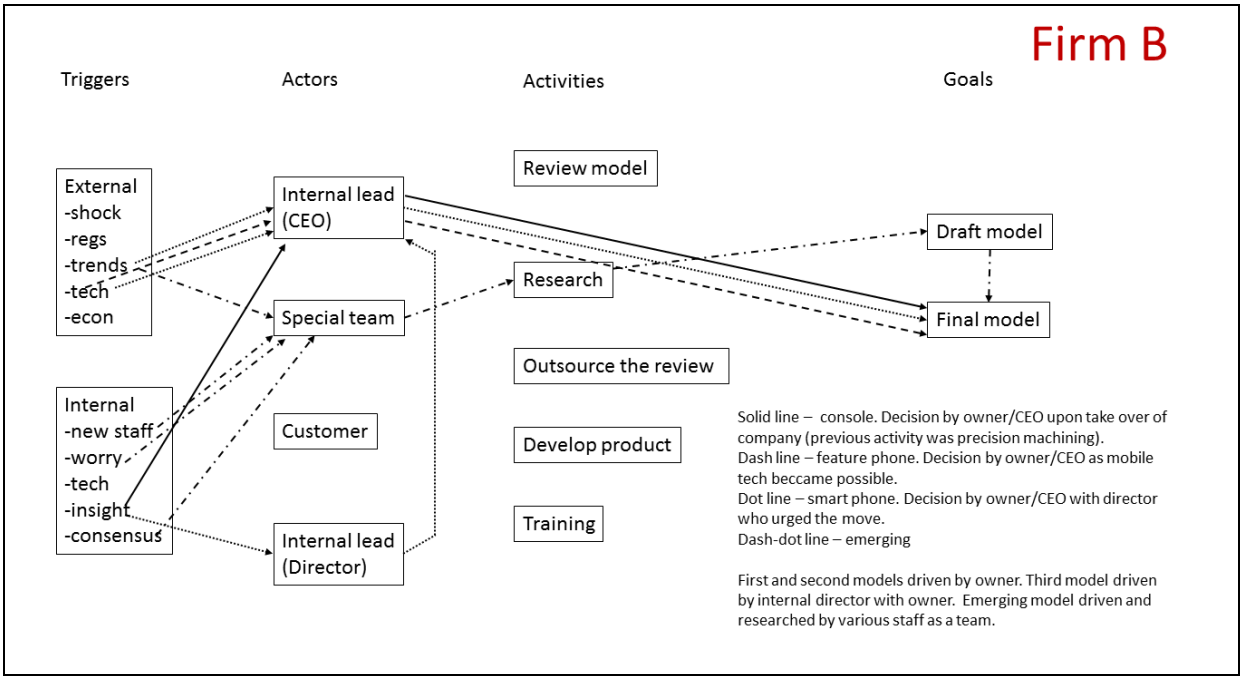

Figure 3: Pathway model example

4.0 Findings

Overall, our findings indicate that all five cases in the study applied multiple business models, including the initial business model at the time of startup and up to three additional models including the current or emerging model. All firms started with rather simple goals to serve their customers and survive in the market. Each firm expanded from simplistic business models to those offering more products, taking in more stakeholders, and accessing more information sources, both digital and physical. The firms studied

appear to be strikingly efficient at innovating their business models. Only one reported a failure at the start of the firm and one reported arriving at a draft version of a new model. Thus, the processes in place appear well suited to moving the firms directly, not blundering, toward new business models. The key findings are elaborated below.

Firstly, we found that *none of the case firms maintained the same pathway of business model development.* The initial creation of a business model and each subsequent adjustment or evolution has events and influencing actors. These events and influences necessarily have a sequence in time and thus form a pathway. While pathways are not necessarily unique and may not always change with each evolution, they do all change over time in the cases investigated here. Examples of changes include different triggers, different staff members, greater or lesser involvement of top management.

Secondly, *pathways tend to become more complex as the companies mature.* The findings reveal that the number of nodes and edges in the mapped pathways increases in most of the case firms over the time. However, Firm E was an exception; their final, third pathway became simpler than the second one, perhaps because the firm had completed intense technical capacity building by the time of the third model and was no longer in flux. The tendency for pathways to become more complex is linked to the increased number of people and groups that participate in the process of developing subsequent business models. The complexity of pathways can be expressed as the number of edges and nodes in the graphic representations of each firm's pathways. The numbers are summarized in Table 3 below to show the relative complexity of pathways to business model development in each model and company.

Firm	Model 1	Model 2	Model 3	Model 4
Firm A	9	4	13	NA
Firm B	5	5	12	14
Firm C	7	9	12	NA
Firm D	9	5	7	4
Firm E	7	9	8	NA
Total count of edges and nodes	37	32	52	18
Average	7.4	6.4	10.5	9

Table 3: Increasing complexity of pathways to model creation

Thirdly, our findings indicate that *tendency to increase the number of people involved as the firm matures* (Table 4). In all cases but one (firm A), the number of individuals involved in developing the business model increased. Firm A had only eight employees and it is the founder who directs new product development and changes to the business model. Other case firms devolved tasks of learning, monitoring the environment, identifying, and promoting business models to lower levels of staff whether formally or informally. In Firm C, the management has made sustained efforts to empower all levels of staff to expand the business model as well as the client base and product offerings.

Fourthly, *disintermediation of producing firm and end users was found in all case companies.* The value chain shortened when a business model evolved in each company studied. Firm A was able to cut out distribution platforms such as iTunes. Firm B engaged more directly with customers through touch screen

cell phones. Firm C uses its engineers as direct points of contacts allowing it freedom from the former parent company. In the case of Firm D, the value chain was made shorter and at the same time more complex in order to access more sources of information. Firm E was able to move from supplier status to a position at the top of the industry, directly accessing end users.

Firm	A	B	C	D	E
Decrease/Increase	D	I	I	I	I
Ultimate key people and groups	Founder is sole person	Formal staff group	All staff	Formal staff group	Many of staff

Table 4: Increase or decrease of people involved

Fifthly, we found that the case firms had a *tendency to move to a "state of awareness" as the firm matures.* Firms A, C, D, and F indicated that they keep alert for changes in the business environment (technology, trends, etc.) that would trigger a change in the business model. The founder of Firm A referred to this as the "helicopter view" which he himself maintains through constant reading of general news and industry trends. The move to greater awareness of the business environment included more than one person in Firms B, C, and D, diffusing the strategic awareness from one individual into groups.

Finally, it seems that the informants in the case firms had no intended purpose of attaining a business model, only of general business success. None had considered abstract business model mapping before. Similarly, no intermediate or draft models were formally developed or considered. From this we can conclude that firms are so involved in their daily activities that they do not consider their business models or how to develop them further.

5.0 Conclusions

The aim of this chapter was to provide an answer to the question: *What do the processes for developing a new business model look like inside a technology SME and how do the processes evolve over time?* We found that in general, the processes appear as a series of steps that repeat over time. A streamlined depiction of the steps shows one or more triggers, one or more agents, one or more activities, and a final new or improved business model. The pathways mapped in the case firms allow a detailed look inside the boxes depicted in Ojala's (2016a) preliminary theory of business model evolution.

This chapter also shows that the process does change and evolve over the time, specifically through the following findings:

- No company maintained the same pathway of business model development.
- Pathways tend to become more complex as the companies mature.
- Tendency to increase the number of people involved as the company matures.
- Disintermediation of producing company and end users was found in all case companies.

In conclusion, the internal processes for developing business models become more complex as digitalization develops inside and outside the firms. At the same time, if there was not from the start a "watcher in the tower" monitoring and assessing the business environment, there is now; usually it is more than one individual who keeps watch.

The fact that the firms in the case study are all still in business shows that they successfully navigated new business environments and business models. Interesting comparative information could perhaps be developed from similar firms in the same sector that did not survive in the same environment as the firms studied. Another interesting possibility would be compared Japanese technology SMEs with corresponding firms from other countries. This would show for instance how entrepreneurial culture might impact on business model evolution and firms' survival.

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