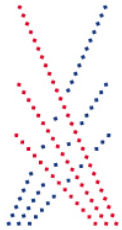

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Decision-making in Platform Leadership: The Case of App Developers

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Abstract:

Lowering the R&D and operation cost, finding answers to multifaceted issues, better understanding of the market and stakeholders' needs are widely seen as the drivers of adopting open platform leadership for large organisations. Academic research stresses the factors such satisfaction, quality of alternatives, trust, and commitment can play an important role in building a strong inter-firm relationship among platform owner and its complementors. However, we know little of what are the beliefs complementors have in the process of developing their innovation. Based on the challenges platform ecosystems place on complementors, this study investigates app developers information processing and decision making while developing their new innovative products. The research will be carried out through individual face-to-face online interviews with thirty app developers of Microsoft HoloLens device.

Keywords:

Open innovation, platform leadership, complementors, cognitive mapping, beliefs

Innovation Track

Word count: 2481

Introduction

Regardless of having a high profile and leading position in the market, large corporations like Microsoft and Apple rely on developing parts of their products/services outside of their organisations (Gawer and Henderson, 2007). Equally, other technology companies like Intel are unable to fully succeed in the market alone as their value can be recognised only after it is plugged into larger platforms or system that involve other firms' products (Cusumano and Gawer, 2002; West, 2003; Perrons, 2009). In these examples, the contribution of external stakeholders or complementors to the process of product development is significant (Perrons, 2009). This resonates perfectly with the research that has been done by Chesbrough (2006) and von Hippel (2005) on the subject of Open-Innovation. However, while Greenstein (2009) and Schilling (2009) have noted the positive effects of opening up interfaces to increase complementors' incentives to innovate, they also point out that the preservation of revenue and profit is essential. A balanced view of open innovation suggests that a more subtle understanding is required (Gawer and Cusumano, 2014).

Prior studies designate platform leadership to be the outcome of factors like R&D cost, lack of confidence in success of innovation, product failure rate, and technology which "*has become so sophisticated, broad, and expensive that even the largest companies cant's to do it all themselves*" (Leonard-Barton, 1995, p.135). As a result, a platform leadership strategy has been used by corporations like Microsoft which allows them to drive the innovation process and speed up market growth in their sector (Perrons, 2009). Platform leaders are "*organisations that successfully establish their product, service, or technology as an industry platform and rise to a position where they can influence the trajectory of the overall technological and business system of which the platform is a core element*" (Gawer and Cusumano, 2014, p.423).

Most prior research focuses on the strategic factors for the success of platform leaders. Gawer and Cusumano (2014), based on their investigations at Intel, have established four strategic options known as "four levers" for firms aiming to create platform leadership. They suggest that firm scope, technology design, external relations with complementors, and internal organisations are used to design and examine the rationality of their strategy. Giving up control on the product development by complementors is being used by platforms leaders like Intel and Amazon. Although it lowers the amount of leader's share of profit and minimises the barrier to entry for complementors, open innovation improves the adoption of the system through lowering users' fear of being locked into a particular organisation (Farrell and Gallini, 1988, Katz and Shapiro, 1994; Boudreau, 2010).

On the other hand, the Intel case study (Gawer and Henderson, 2007) shows that giving up control is not enough to achieve success as a platform leader; it also requires involving in a series of organisational workshops to create commitment (Boudreau, 2010). Also, factors such as architectural control and interdependency allow leaders to be confident in driving their new technical integrity, in their growing technology platform (Schilling, 2009). The barrier to entry for the rivals into the platform and networking between platform leader and its complementors (i.e. third-party service providers or app firms) have been shown as the positive outcomes of the inter-firms relationship (see, for example, Parker and Van Alstyne, 2005).

Gaining access to customers of the platform is the biggest motivation for the complementors to join a platform (Chellappa and Saraf, 2010). Technical documentation and support from a platform leader and the ability to exchange ideas and communicate with other developers are also known to be factors that encourage complementors to join platforms (Benlian, Hilkert, and Hess, 2015). Complementors, to achieve their goals, research suggest complementors should

share resources, lifecycle flow, and leadership (Rickmann et al., 2014). Prior studies also have shown that satisfaction and perceived usefulness can act as critical drivers for app developers to continue developing a new app for platforms. Although prior research has investigated the main aims and goals of platform leaders, there is a lack of research into the contribution of complementors to platform success.

Research also illustrates, there are some risks associated with the contribution of complementors. Lack of platform leaders' ability in providing full support for the entire collaborating businesses during the process of innovation development can result in innovation failure. Also, suppliers might find the specifications of the R&D as too specific and unique to be implemented into any other technologies which is possible to be counted as a threat for complementors. Lastly, the lack of willingness of complementors in sharing highly proprietary information among the other complementors or subsystem can also lower the chance of platform success (Monteverde and Teece, 1982; Teece, 1986; Balakrishnan and Wernerfelt, 1986; Gawer and Cusumano, 2002, p.95).

Trust is also important for platform success. Moorman, Zaltman, and Deshpande (1992) found that behaviour intention and beliefs in partner's reliability, are necessary for the existence trust. Concerning this, Kumar et al. (1996) emphasised that trust consists of two critical features. The first feature is the partner's altruism which is the belief in the progress and process of development of the other firm. And the second one is credibility and honesty of the other firm meaning the belief in other firm having the required expertise and skills as well as meeting the promises it has made through building inter-firms relationship. In an inter-firm relationship, all the firms need to value their common beliefs about the aims, behaviours, and strategies (Morgan and Hunt, 1994). However, prior studies have failed to investigate what these beliefs are. This study aims to investigate complementors' information processing and decision making during the development of innovation. It also aims to understand what set of beliefs do complementors have about the platform in the process of developing their innovations and how these beliefs might change after the launch. The research will be conducted by interviewing the app developers for the Microsoft HoloLens device.

HoloLens is a mixed reality device, and it has a see-through display which offers a mix between physical and digital realities (Microsoft HoloLens, 2019). Focusing on the Microsoft HoloLens device and its app developers and knowing the dramatic rise in the customer's demand in the mixed reality field in the next couple of years. It allows this research to have a better understanding of belief structure acts as a guide to an information domain from the early stages of product development. Therefore, the goal of this research is to investigate the beliefs and their relationship to decision environments in the platform ecosystem (Walsh, 1988).

Literature review

The highly time-consuming and costly process of R&D, especially in the high-tech sector, is encouraging organisations to use external sources for the development of their innovations (Chesbrough, 2006; Chesbrough, Vanhaverbeke, and West, 2006). Open innovation as the new paradigm for innovation management has enabled organisations to outsource part of their innovation development to external agents (Chesbrough, 2006; Gassmann, 2006). Chesbrough et al. (2006) define the concept of Open Innovation as "*... the use of purposive inflows and outflows of knowledge to accelerate internal innovation and expand the markets for external use of innovation, respectively*" (Chesbrough et al., 2006, p. 1).

West and Boger (2014) have developed a four-phase open innovation model which highlights the importance of obtaining, integrating, and commercialising innovations and also the interaction required by providing an outside-in perspective about the process of new product development. In the supplier integration phase, strong partnerships lead to knowledge and skills sharing, which would potentially increase the chance of innovation success. Large organisations by creating an open platform known as industry or external platform become the foundation for a larger number of businesses (mainly SMEs) to produce additional complementary innovations and possibly create network effects (Gawer and Cusumano, 2014).

Gawer and Cusumano (2008) argue that to develop a successful platform, platform owners need to consider two factors. Firstly, the platform must achieve a purpose which needs to be crucial to a broader technological system. Secondly, the platform must solve a problem in business which would be beneficial for other organisations and users in that particular industry. Muffatto and Roveda (2002) in their study found that large organisations like Apple and Microsoft, by developing and adopting platforms, do aim for continuously developing innovation and forming their development and operations strategies. The level of openness of organisations in allowing complementors to participate in innovation development varies on a number of dimensions. These dimensions are accessing into interface information linked to the platform, use its capabilities and accessing cost (licensing fees), or rules governing the platform (see, for example, Anvaari and Jansen, 2013).

Platform owners are able to improve their efficiency through bundling complements (Davis, MacCrisken & Murphy, 2002). For instance, by acknowledging the economies of scope in users' activities, they are able to sell a greater valuable bundle with a single marketing campaign. In addition, integrated designs do produce quality advantages via interface simplification (e.g. Apple's iPod/iTunes system). Gawer and Henderson (2007) found platform leaders like Intel, by continuously controlling the platform ecosystem while motivating complementors to innovate "on top of" the newly extended platform, carefully try to select their complementary market. Since, too many complementors in the platform might discourage other businesses to invest and join the ecosystem (Boudreau, 2012).

Building relationship and trust with complementors do allow platform leaders to create vibrant coalition around the platform ecosystem in which it leads to increasing profit margin (Gawer and Cusumano, 2014). Principal-agent theory in platform leadership studies allows researchers to investigate the relationship between complementors and platform owner in which how this relationship will act to benefit the platform leader (Sako, 1998; Perrons, 2009). In this regard, Perrons (2009) found that platform leaders use power to reduce possible risks when working with unfamiliar firms through increasing a genuine sense of trust between participants. The other studies did investigate to what extent firms think similarly and share mutual values by looking at the factors like international and cultural norms (Nooteboom, 1999), and the attitudes and beliefs of members of each organisation (Brenkert, 1998).

Developers' ability to manage their innovation has been investigated through sensemaking process between individuals at different levels (Christiansen and Varnes, 2009). Sensemaking is defined as "*the reciprocal interaction of information seeking, meaning ascription, and action*" (Thomas et al., 1993, p. 240). Based on sensemaking, individuals to take part in a cognitive process to find an answer to the complex and unclear problems (Weick, 1995; Weick, Sutcliffe, & Obstfeld, 2005; Samdanis and Lee, 2019). Individuals by developing cognitive structure can transfer complex information into a valid and appropriate context (Walsh, 1995; Weick, 1995). Therefore, to investigate the process, this research applies a sensemaking

perspective into decisions made for developing an innovation (Beverland et al., 2016; Leonardi, 2011).

Mental models have been used in organizational (Barr, Stimpert, and Huff, 1992; Weick, 1979; Van Maanen, 1984), sociology, and cognitive psychology studies (Cicourel, 1974; Goffmann, 1974) to investigate how individuals react to new situations. Reflective thinking shows a high amount of cognitive openness and capacity. Reflective thinkers improve their sensemaking through depending on private and shared (i.e., cultural) mental models in entirely new ways. Such cognitive alteration needs determination. Being able to change from being a categorical to reflective thinking requires business managers to be cognitively agile, thoughtful, and capable of sensing the dissonance between external reactions and their sensemaking (i.e., internalized mental model). Reflective thinking is typically a requirement for mental model commotion. However, it may not be the result if developers judge the less disruptive model to have the best choice and stick to it. In cases where individuals are deeply involved, mental models are not accurate anymore. Either by a radical shift, also known as conversion experience or through continues and extensive learning process that results in a gradual shift. An example of this can be when managers acknowledge their limitations due to an existing mental process (Ringberg and Reihlen, 2008; Van derVeer, 1998).

Considering complementors being reflective thinkers (since taking the risk to develop their innovation in a new platform), by applying the sensemaking mental models, this research is aiming to answer how complementors' beliefs influence long-run application software innovation and its growth in the platform ecosystem. Prior researchers have acknowledged the importance of building a successful platform by building a strong relationship between platform leader and its' complementors. However, there is a lack of knowledge of how beliefs of app developers affect their continuing innovation development. To investigate this gap, this study follows sensemaking perspective decisions made during the development of application software innovation (Beverland et al., 2016; Christiansen and Varnes, 2009; Prior, Keränen, and Koskela, 2018; Samdanis and Lee, 2019; Weick, 1995). These beliefs will be about the underlying technology (MR), the platform owner, and value appropriation. Also, factors such as organisational, social, and commercial goals of the complementors will be considered, as these factors will most likely play a role in an individual's beliefs (Oh et al., 2015; Ghazawneh & Henfridsson, 2015).

Methodology

This research by using cognitive maps as the method of analysis is aiming to investigate complementors' beliefs. The best method to address the objectives is using a multiple case study method to allow an in-depth study of complementor's decision making in the platform ecosystem. It is due to app developers having separate jobs and are not employed by the Microsoft. Through the use of a multiple case study, it is expected to understand the set of beliefs that encourage app developers to stay and repeatedly develop new apps for the same platform by questioning the past theoretical relationships and exploring the new ones. Therefore, this research will be conducted by interviewing the app developers for the Microsoft HoloLens mixed reality device.

Mixed reality (MR) environment is where virtual, and real objects are combined, given the device (Dennison, Thomas, Trout, and Rosenberg, 2018). Statistics show the worldwide adoption and usage of the MR devices is estimated to dramatically increase from 12 billion U.S. dollars in 2018 to 192 billion U.S. dollars in 2022 which indicates an immense increase

in customer's demands for MR and AR devices. (Statista, 2019). Magic Leap, Microsoft HoloLens, ODG, and Vuzix are the main headset developers in the market.

HoloLens device was introduced to the market in 2015 and has a see-through display which offers a mix between physical and digital realities (Microsoft HoloLens, 2019). This headset is targeting professionals such as surgeons, engineers, designers, builders, and police and army academies. Motion controllers, gaze, coordinate systems, and better graphics are the key criteria developers are interested in that has allowed HoloLens to reach the market-leading position. Focusing on its app developers allows this research to have a better understanding of belief structure acts as a guide to an information domain from the early stages of product development.

Data collection and analysis

Data has already been collected via 18 in-depth interviews but data collection is on-going and the results of the analysis will be available for BAM 2019.

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