Platform Paradox

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Abstract: Porter (1998) noted that with continuing global homogenization in companies’ condition to obtain resources and gain access to markets, there is an increasing need to create a local, competitive advantage in industrial clusters. He called the importance of location in this age of globalization a “location paradox.” Similarly, when industry-wide platforms appear and global development technologies are standardized, companies need to accumulate unique technical capabilities to differentiate themselves. In this paper, this phenomenon is known as the “platform paradox,” and is verified by a case of videogame industry. The utilization of development platforms (game engines and middleware) standard within this industry during the 2000s, causing global homogenization in development technology. Videogame development companies’ industrial cluster located in Japan’s city of Fukuoka cooperated in technological matters in an effort to differentiate themselves with their technological sophistication in using platforms. By aggressively sharing knowledge to optimally utilize hardware and development tools, these companies have created a store of unique

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Introduction

Abundant transportation infrastructure and advances in telecommunications technology mean that the advantages of availability of production resources and access to markets are unchanged irrespective of a company’s location. Agricultural product and large home appliance companies create large-scale production centers in regions with low labor costs, land prices, and taxes, and ship products to global markets from there. However, this does not necessarily mean that all industries in developed countries shift operations overseas. For example, Silicon Valley’s high-tech industry in the US and automotive industry in Japan have kept their high levels of competitiveness. In these industries, tight communications gained by the geographical proximity of individuals, companies, and government organizations that are the prime movers of the industry have been a source of competitive advantage. Porter (1998) coined the term “location paradox” to describe the importance of local competitiveness in the global era, as competitive advantage within industrial clusters became an important differentiator.

In this paper, focus is on platforms as having an impact similar to the “global homogenization of certain competitive factors in heightening the importance of competitive advantages in industrial clusters.”¹ Taking a cue from Porter (1998), the heightened

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¹ Platforms are products and services that function as core integrators and comprise products and services. For example, personal computer operating systems are the foundation that allow various applications to
importance of specialized knowledge for differentiation is known as global technological homogenization due to the advent of platforms—“platform paradoxes.”

Products and services offered as platforms show great economies of scale within development and production. Integration of innovations in complementary products and services is made possible as platforms appear, inspiring technological advancements via open innovation. Through these economies of scale and network externalities caused by complementary products, numerically larger platforms have the advantage of further expanding. Thus, for products and services for which language and transportation costs are not great barriers, platforms can become global de facto standards (Tatsumoto, Ogawa, & Shintaku, 2011).

When a certain platform becomes a global standard and a competitive environment based on open innovation is realized, availability of technology and sales channels within companies using these platforms are homogenized, and the barriers to entry are reduced. Simultaneously, homogenization and reducing barriers to entry cause a loss of differentiation and an intense competition, resulting in profit reduction. For example, Intel is a platform leader in the PC industry, managing various component standards to match Intel’s CPUs (Gawer & Cusumano, 2002). In doing so, it is possible to create a product by simply assembling third-party parts, the result being a highly competitive finished goods industry. In the smartphone applications arena, Apple created the App Store as a run on computers (Cusumano, 2004; Gawer & Cusumano, 2002); within services, electronic transaction services integrate various shipping, settlement, and delivery services (Kokuryo, 1999). Recent examples of platforms include Internet services that integrate SNS, e-mail services, and web games.

Under the open innovation, companies do not need to own the entire technology for products and services, because they can use the third-party technologies as required and appropriately combine them (Chesbrough, 2003).
sales platform, making it possible for individuals and small development shops to prosper, as well as sell applications. As a result of many developers selling on that platform, it becomes extraordinarily difficult to get attention.

The establishment of platforms and decreasing gap in certain areas of competence among companies stimulates them to build competence in other areas. For example, Christensen (2006) highlights that to gain core competencies in open innovation, companies have to accumulate internal technologies that cannot be imitated by others, while additionally evaluating outside technologies and incorporating them as required. Fujimoto (2004), as well, noted that if product architecture is open and modular, and a company simply assembles modular components to manufacture products, their only way to survive is to win a price war by their cost advantage. To get a high added value, companies are required to master the module use, such as organizational capability, product planning, and solution providing ability to respond to customer needs using appropriate modular components.

Local networks within industrial clusters are important in combining technologies from various companies in open innovation (Simard & West, 2006). Just as with the location paradox proposed by Porter (1998), among solutions to the platform paradox, differentiation from companies in other regions can be effectively achieved by developing and consolidating regional knowledge within an industrial cluster.

In this paper, it is confirmed that as technological differences between companies shrank with the diffusion of development platforms in the videogame industry, there is an accompanying demand for technology to use these platforms. In addition, we test the effectiveness of accumulating knowledge within industrial clusters due to this phenomenon, through the case study of a videogame industrial cluster located in Fukuoka City.
Development Platform Diffusion in the Videogame Industry

According to Ikuine (2000), who studied development processes in Japan’s videogame software development industry from the 1980s to 2000, there was a demand for overall integration under the concepts of each videogame software title, and therefore each title was developed under the producer who coordinated and optimized the overall process.

In contrast to the integral development model, the concept of a game engine arouse out of “Doom” and other PC-based first-person shooter games (i.e., games where the screen shows a peripheral view from the player’s perspective, where the player shoots at enemies with guns) in the mid-1990s. Soon companies that offered these game engines would emerge (Gregory, 2009).

A game engine is software that executes a game and provides a set of tools to create data used within the game software, as well as workflows to determine how the game will be created. It is “a comprehensive solution for game development” (Oomae, 2010). Companies can shorten development periods and reduce development costs by developing high-performance game engines and using it across their titles. They can sell it to third parties to achieve further economies of scale in the game engine development.

During the 2000s, the development load in the videogame industry increased along with the enhancement of hardware performance. An awareness of the importance of game engines arose as a response to that trend (Oomae, 2010).³

Companies developing many titles created their own game engines, and were able to recover the cost by internal use. In contrast, small-

³ Around the same time, a trend toward franchise titles that could reduce development load by reusing brand names and game concepts also took hold, though that caused the market to shrink as users lost a sense of novelty and became tired of these franchises (Wada, 2011).
and medium-sized companies select the external game engines to keep development costs low. As a result, the best game engines began to be used throughout companies’ development organizations.

In addition to the game engine, “programs that provide specific functions within game development” such as music or video are a form of middleware (Oomae, 2010). Along with game engines being broadly used across companies, middleware became important for firms as well.

As a result, companies were able to develop their own games by utilizing third-party game engines and middleware. An open innovation development model with game engines as platforms was established in the home videogame industry, as opposed to the integrated model of development in the past, where companies created all the technologies needed for internal development.

Game development companies can heighten their competitiveness by selecting and using optimal game engines and middleware, though any global competitor can make similar choices. Thus, further competence in using game engines and middleware is required, whereby “platform paradox” occurs.

### Competitiveness of a Fukuoka City Industry Cluster

In this section, the effectiveness of accumulating knowledge in industrial clusters is tested as a solution to the platform paradox in the videogame industry through the example of the videogame industry cluster of Fukuoka City.4

The historical background of the formation of the Fukuoka region

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4 Information relating to companies and organizations in this Fukuoka cluster case study is based on interview-based surveys conducted from March 9–11, 2011, as well as PR materials and websites. More details on this survey have been made public by Wada, Ichikohji, Hanzawa, Ikuine, and Zhang (2012).
cluster is as follows. There were several videogame software companies in the Fukuoka region, enough to be viewed as an agglomeration. However, each of these companies operated independently, and the agglomeration was not functioning as an industrial cluster, where would the companies cooperate to create innovations. In 2003, the presidents of LEVEL-5 Inc., CyberConnect2 Co., Ltd., and GANBARION Co., Ltd. declared their ideal of making Fukuoka “the Hollywood of the game industry,” and opened the Game Factory Fukuoka event. A year later, the group established the Game Factory’s Friendship (GFF) as an executive office to develop the success of the previous year’s event into more permanent, broader efforts. Simultaneously, they encouraged other development companies to participate and formed a cooperating framework among these companies. Current participants in this organization consist of 12 companies, including one company in Kumamoto. The organization has evolved into a partnership between industry, academia, and government, with the addition of the Fukuoka City government and Kyushu University.

Apart from one sales company and two debugging companies, these companies either develop and publish in-house or develop for publishing companies located in the Tokyo area or other regions, and none have vertical transaction relationships with other companies in the region. Baba and Shibuya (1999, 2000) analyzed the videogame cluster in the Tokyo area and discussed one of the merits of agglomeration being a close communication between publishing and development companies, but this merit does not exist here.

In addition, few developers change companies in Fukuoka, thus there is no chance of a knowledge spillover that accompanies job switching such as in the Silicon Valley and Hollywood.

What are the merits of the videogame industrial cluster in Fukuoka City? In interviews with GFF member companies, we confirmed that the first merit is the added name recognition brought to the region by
appealing the fact that several videogame development companies are located in the Fukuoka region. This not only makes it easier to take on contract development work from publishing companies in Tokyo and elsewhere but also makes it easier to draw human resources from across the country. GFF is specifically active in PR activities via various media channels, sponsoring videogame-related events, and promoting internship opportunities. As Porter (1998) noted, with regard to inter-corporate marketing and hiring activities, these can be viewed as attempts to gain more efficiency through standardizing activities within a region. However, this efficiency effect by itself can be imitated by other regions implementing the same efforts, and it cannot be stated as a unique advantage to the cluster in the Fukuoka region.

Another point given as a second merit of industrial clusters is the knowledge sharing that occurs between companies via information exchanges. Specific examples of these efforts include the GFF-sponsored debriefings held after the Game Developers Conference (GDC) and Computer Entertainment Developers Conference (CEDEC). Thus, after the GDC or CEDEC ends, creators from each company participating in the respective year become lecturers, using materials for internal corporate reports as is in half-day study sessions. Subsequently, they have roundtables for each of the various functions among the companies, and sponsor opinion exchange meetings at least twice a year after the GDC and CEDEC events. Among GFF member companies, those companies that can participate in the GDC and CEDEC are limited, though the companies that cannot participate can still share information.

The background of these efforts was the change in perception that occurred after 2000, when demand for advanced technology for videogame software development strengthened and the amount of knowledge that is required became extremely enormous to be handled by an individual company and information sharing became
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indispensable to the videogame industry. With regard to information sharing, job changes among development personnel in the Fukuoka region were infrequent; therefore, making knowledge transfer from spillovers unlikely. Thus, companies have created ways to publicly share technological knowledge.

In the videogame industry, companies have been facing mostly similar problems in using development platforms around the same time, because they develop videogame software for same hardware mostly using the same development platforms namely middleware and game engine. Companies in the industrial cluster can increase their competence using platforms by finding their own way to solve these problems and continue sharing successes with each other.

Within the Fukuoka City industrial cluster, companies must use globally used third-party platforms to increase development efficiency, but these companies will not be successful in using these platforms if they do not create competencies in sharing knowledge creation with other companies in the industrial cluster. This is what causes the phenomenon of the platform paradox.

**Discussion**

In this paper, it is confirmed that global homogenization caused by platforms increased the importance of creating competitive advantage in industrial clusters, similar to the location paradox argument proposed by Porter (1998).

However, mechanisms that demonstrate the competitive advantage of industrial clusters as confirmed in our case study differ from those discussed by Porter (1998).

Factors used to explain industrial agglomeration are the minimization of labor and transportation costs, as well as internal and external economies (Inamizu & Wakabayashi, 2013). Porter (1998) noted the importance of external economies such as peer
pressure resulting from intra-industry competition, cooperation with related and supporting industries, human resources, and infrastructure as the minimization of labor and transportation costs become useless in competing. Porter’s argument can be construed as a positioning view of strategy to explain competitiveness via environmental factors.

Saxenian (1994) criticized arguments focusing on external economies and environmental conditions within industrial agglomeration as espoused by Porter (1998), noting that performance differences in regions with external environments similar to the Silicon Valley and Route 128 cannot be explained. Further, Saxenian highlights the importance of regional intercorporate networks and cultures, intercorporate relationships, and corporate organizations. If one were to explain Saxenian’s points in strategic terms critical of Porter, it would likely be placed in the resource-based view. Saxenian states that the scope of external economies comprises intercorporate information and mutual learning, but that interactions going beyond these corporate frameworks blur the line between internal and external economies. If one was to use the concept of the transfirm organization discussed by Takahashi (2000, 2014), it is regionally created, and the organizational capabilities accumulated within it become the source of their competitiveness.

In this paper’s example of Fukuoka’s videogame industrial cluster, CyberConnect2, a company aggressively disseminating information via information exchange forums, answered that their reason for doing these information exchanges was that “videogame software succeeds or fails based on the merits of the software’s ideas and ability to entertain, and digital tools and programming technologies are nothing more than tools; winning in that area is not our objective.” Based on this philosophy, the City of Fukuoka has transfirm organizations that transcend companies, and are increasing competitiveness through the accumulation of
technological knowledge.

In addition to this accumulation of technological knowledge, sufficient capital and human resources make such advances possible through the power of a single company’s organization. The advantage of Fukuoka’s videogame industrial cluster in relation to large companies is the abundance of know-how arising from the variety of software it develops.

According to Fujimoto (2012), the evolution of organizational capabilities goes through three phases of variation, selection, and retention, necessitating diversity in organizations to induce variation. Multiple companies within an industrial cluster develop products with each product’s strategy and culture, which in turn leads to diversity of know-how. Companies then share this know-how in technology sharing forums, thus establishing a system for selecting and retaining superior technologies. This could be considered a superior system for creating innovation.

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