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Outsourcing Game Software: A Longitudinal Study of Make-or-Buy Decisions in U.S. Videogame Industry

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ABSTRACT
When a software provider releases its software to a platform, it is important to decide not only which platform to choose but also how to release it. This paper investigates a videogame publisher’s strategic decision to provide its videogame titles to each game platform. Specifically, this paper focuses on a game publisher’s outsourcing decision regarding its game releases. Combining transaction cost theory with theories concerning modularity and network effects, the paper examines the determinants of a game publisher’s make-or-buy decision. Then, this paper empirically tests the impact of each determinant with the videogame titles data from 1991 to 2002. The results give a foundation for future research issues regarding the application of transaction cost theory to the context of modular system architecture and network-based competition, which are the key characteristics of the IT industry, and call for new determinants of the make-or-buy decision.

Keywords
Outsourcing, make-or-buy decision, transaction cost, network effects, modularity.

INTRODUCTION
Over the past decade, researchers have been interested in the evolution of platform as a dominant design or market standard and the firm’s response strategy for a new dominant platform (Farrell and Saloner, 1985; Katz and Shapiro, 1985, 1994; Schilling, 2002; Shapiro and Varian, 1999). According to Anderson and Tushman (1990), a platform as a dominant design is preceded by the competition between rival platforms; such competition is a function of network effects (Farrell and Saloner, 1985; Katz and Shapiro, 1985, 1994; Shapiro and Varian, 1999). Specifically, it is believed that indirect network effects, the benefit due to various complementary goods such as videogame titles for a videogame platform, play a critical role for the success of platform provider (Gallagher and Park, 2002; Katz and Shapiro, 1994; Schilling, 2002, 2003). However, such issues are also critical to complementors providing complementary goods. This paper attempts to investigate a complementor’s response to a new emerging platform. Specifically, this paper attempts to answer this question: How should a complementor provide complementary goods? What factors influence such a decision?

I answer this question using the U.S. videogame industry as a research context for several reasons. First in terms of the market size, it is estimated that the number of sales units of videogame consoles (excluding the sales of game titles) will exceed 40 million units worldwide, and more than 60 million game titles were sold worldwide in 2002 (around 30 million game titles sold in the States) (In-Stat/MDR report, 2002; Market Share Reporter, 2004). Second, since its first launch to market in 1977, the dominant design has been dynamically changed due to technological discontinuity and support of complementary goods (Gallagher and Park, 2002). Third, it is shown that most videogame publishers and platform manufacturers have been providing their in-house game titles as well as varying number of game titles bought from third party game developers. Therefore, the videogame industry can provide a rich context to investigate the complementors’ make-or-buy decisions in dynamic platform environment.

THEORETICAL PERSPECTIVES
A dominant paradigm used to explain outsourcing or make-or-buy decisions is based on transaction cost theory (TCT) (Williamson, 1985). One of the basic premises of TCT is that TCT views a firm as a governance structure and transaction costs determine either markets or firms (Williamson, 1975, 1989). If transaction costs are substantial and exceed the production cost advantages of market, a firm will make components in-house (Williamson, 1989, 1991). Among the dimensions of transaction costs, asset specificity, the degree to which an asset can be redeployed without losing its value, has played a central role of determining the degree of transaction costs and make-or-buy decisions (Williamson, 1989, 1991).
Moreover, when a firm has highly specific assets coupled with high uncertainty and high transaction frequency, it tends to make products in-house.

However, each firm facing similar transaction costs actually makes various make-or-buy decisions (e.g. Leiblein and Miller, 2003). In fact, the effect of transaction costs on make-or-buy decisions will be contingent on other attributes of each firm. Specifically in the IT industry, it is argued that modularity and network effects might determine a complementor’s make-or-buy decisions (Baldwin and Clark, 2000; Katz and Shapiro, 1985, 1994; Shapiro and Varian, 1999). Combined together, the determinants of a videogame publisher’s make-or-buy decision can be categorized into two groups: transaction-level determinants and firm-level determinants on make-or-buy decision following Leiblein and Miller’s (2003) framework. Transaction level determinants refer to the transaction conditions affecting a videogame publisher’s make-or-buy decision. These factors include platform age, platform dominance, and competition in videogame market. On the other hand, firm-level determinants refer to the firm-level attributes of each game publisher including each game publisher’s inimitable knowledge, asset portability, platform experience, and identity (either platform manufacturer or not).

RESEARCH MODEL: DETERMINANTS OF MAKE-OR-BUY DECISIONS

Platform Age
While it is theoretically argued that high environmental uncertainty is positively related to make decision, the argument receives limited empirical supports. For example, Walker and Weber (1984) find that while high volume uncertainty (the fluctuation of consumer demands) influences manufacturers to choose a make decision, technological uncertainty has no impact on the decision. In the vein of TCT, frequent technological changes make it hard to flexibly respond to the technological change. As a result, the fear of being locked into a technology becoming obsolete will result in more outsourcing (Heide and John, 1990). Such technological obsolescence is substantial in videogame industry. According to Gallagher and Park (2002), the U.S. videogame industry historically follows six generations of platforms every five or six years due to technological innovation. Therefore, in the context of videogame platform, as the age of platform increases (becomes obsolete), the existing platform will be vulnerable to the entry of new platforms and thus videogame companies will be less likely to make in-house game titles specific to an old platform.

H1: The age of videogame platform is negatively related to make decision.

Platform Dominance
A videogame platform not only has technological characteristics but also has network effect characteristics (Farrell and Saloner, 1985; Katz and Shapiro, 1985, 1994; Shapiro and Varian, 1999). As the number of installed base and complementary goods increase, a platform becomes a dominant design where more game publishers would provide more game titles and more customers would join in order to enjoy a variety of available game titles. Thus, a videogame publisher would commit to develop as many game titles as possible in-house since the company can reap the potential margin of game title sales in a large installed base (Gallagher and Park, 2002).

H2: The dominance of videogame platform is positively related to make decision.

Competition
In addition to Williamson’s classic dimensions of transaction costs, empirical studies suggest that transaction costs are also influenced by supplier competition in that it would decrease transaction costs by increasing the risk of replacement of suppliers (Williamson, 1985). However, such argument should be reconsidered in the videogame industry because a supplier (developer) working for a game publisher can become a rival publisher, too (Brandenburger and Nalebuff, 1996). As the number of alternative developers increases, a videogame publisher as a buyer might choose an external game developer as a supplier for a certain game. However, during the game development project, some tacit knowledge or skill regarding the game development might be transferred to the external developer. As a result, the appropriation of knowledge by external developers might undermine the benefit of a publisher’s know-how when developers become or work for rival publishers. Therefore, the competition between publishers might lead to more in-house game titles.

H3: The competition between rival publishers per each platform is positively related to make decision.

Knowledge Inimitability
A firm’s unique knowledge is also significant as Williamson (1996: 114) argues that “the value of specialized knowledge and information may be appropriated and/or dissipated by suppliers, buyers, and rivals.” When a firm’s proprietary knowledge is
vulnerable to other company’s appropriation, the firm attempts to reduce the risk of knowledge leakage by internalizing such knowledge (e.g. patents or copyrights). Therefore, if a videogame publisher has specific inimitable knowledge, the company will be more likely to develop game titles in-house.

**H4: The videogame publisher’s knowledge inimitability is positively related to make decision.**

**Asset Portability**

The videogame industry has the characteristic of modularity which might extend the traditional TCT. Based on the modularity concept, a platform manufacturers and game titles publishers/developers can independently provide their products to the market. Baldwin and Clark (2002) describe the benefit of modularity for reducing transaction costs as follows. While the modularization of production system requires initial transaction costs of specifying, standardizing, assessing, and paying for each module, it eliminates the costs of ongoing transfers of materials and information between different modules. Specifically in terms of complementor’s view, a videogame publisher can develop virtually identical game titles across multiple platforms, which is called “porting” (Baldwin and Clark, 2000). Since the interfaces between each module are standardized in videogame system, a game publisher can convert and port an existing game title into a new platform. Therefore, the asset portability of a videogame allows reducing additional production and coordination costs maintaining the benefit of low transaction costs within a firm.

**H5: The asset portability of videogame is positively related to make decision.**

**Publisher’s Platform Experience**

When a videogame publisher is to release its first game titles to a platform, the company does not have sufficient domain knowledge specific to a new platform yet. However, as a game publisher builds its experience on the platform, the efficiency of developing its in-house game titles increases due to the company’s learning curve (Pisano, 1990). That is, a firm’s ability to develop its own game titles depends on the company’s previous experience on the platform because the company’s accumulative experience would reduce internal managing costs.

**H6: The videogame publisher’s experience on platform is positively related to make decision.**

**Platform Manufacturer**

Historically the videogame platforms without the support of game titles by platform manufacturers such as 3DO and NEC’s TurboGrafx 16 failed in the market (Schilling, 2003). One of the main reasons for the failure is that in order to induce third party game publishers, the platform manufacturers need to develop a threshold level of its own game titles (Shapiro and Varian, 1999). Since third party publishers do not have enough information whether to join a platform, it is necessary to induce them with a minimal level of complementary goods and following installed base. Therefore, platform manufacturers will tend to develop more in-house game titles than third party game publishers.

**H7: Platform manufacturers tend to make more in-house game titles than third party game publishers.**

**Interaction Effect: Competition x Platform Dominance**

Hypothesis 3 argues that as the competition per each platform increases, a game publisher would make more game titles. Such main effect will be moderated by the degree of platform dominance. Since each game publisher is more concerned with dominant platforms than non-dominant platforms, the positive effect of competition will be strengthened in dominant platforms. That is, in a dominant platform, a game publisher will be more concerned about knowledge leakage problem according to the increased number of competitors and thus more vertically integrated. On the other hand, a game publisher will be less concerned about the effect of competition in non-dominant platforms and thus be less motivated to make in-house game titles.

**H8: The positive effect of competition on make decision will be moderated by the effect of platform dominance.**

**Interaction Effect: Platform Experience x Platform Dominance**

The main effect of platform experience in H6 will be moderated by the effect of platform dominance. In dominant platforms, a game publisher would like to utilize its experience on platform and reap the market value of dominant platforms with its in-house game titles. Thus, the positive effect of publisher’s platform dominance on vertical integration will be strengthened in dominant platforms. However, a game publisher with accumulative experience on platform is less motivated to develop in-house game titles in non-dominant platforms in that the company tends to invest more resources for dominant platforms.
**H9:** The positive effect of publisher's platform experience on make decision will be moderated by the effect of platform dominance.

![Research Model](image)

**METHOD**

**Dependent Variable**

The unit of analysis in this study is the number of transactions by each game publisher for each platform in each year. The study measures the number of in-house videogame titles as the measure of dependent variable. This measurement follows Walker and Weber’s (1984) binary choice measurement of make-or-buy decision (make: 0, buy: 1) except that the study uses the cumulative number of firm’s in-house game titles. If both a publisher and a developer have a common parent company due to merger and acquisition or joint venture, their released games are coded as in-house.

**Independent Variable**

Platform age is defined as the extent to which a platform becomes obsolete, which is measured by the number years it has existed. If PlayStation is first launched in 1995, its age is coded 1 in 1995.

Platform dominance is defined as the share of each platform in the videogame market. A preliminary analysis of this study shows that the number of game title releases is positively correlated to the sales volume of platform (0.654, p<.05), validating the portion of game title releases per platform as an appropriate measurement of platform dominance.

Competition is defined as the degree of competition between publishers per each game platform. The variable is measured by the number of incumbent publishers per platform and per year, consistent with Walker and Weber’s (1984) work.

A publisher’s knowledge inimitability is measured by the number of cumulative patents of each game publisher is measured per year. The data is collected from the U.S. Patent and Trademark Office Website (www.uspto.gov).

Asset portability is defined as the extent to which a videogame publisher has ported game titles. The variable is measured by the ratio of same (ported) game title series to the total game titles released by each firm per year.

Platform experience is defined as the degree of experience of publisher per platform and per year. The variable is measured by the number of years a publisher has been releasing game titles for a certain platforms in year t.

Platform manufacturer refers to whether a game publisher is a platform manufacturer or not. In terms of measurement, if a game publisher is a platform manufacturer, the variable is coded as 1. If a publisher is not a platform manufacturer, it is codes as 0.
Control Variable

Since the collected data ranges from 1991 to 2002, I included dummy variables for each year from 1991 to 2002 (0 or 1).

Data

In order to test each hypothesis, I assembled a primary database consisting of each game title release announcement from 1991 to 2002. In order to collect transaction data, the study referred to each game platform website (e.g. www.us.playstation.com), third party game publisher’s websites (e.g. www.ea.com), and/or various game portal sites such as gamspot.com, ign.com, and gamasutra.com has been referred. After coding the total of 3617 game title release announcements consisting of the name of title, the name of developer and publisher, the name of platform, and release date, the total number of released game titles by each game publisher for each game platform in each year is counted. As a result, 1060 data points have been created.

Analysis

Before running a statistical analysis, some of variables with non-normal distribution have been transformed. The descriptive analysis shows that the number of made game titles is negatively skewed. In order to solve the problem, the raw data was transformed with square root, which satisfies the normal distribution assumption (skewness=0.928, kurtosis=0.858). Likewise, knowledge inimitability and asset portability were transformed with natural logarithm transformation.

After the transformations, the study used a hierarchical OLS regression analysis in order to investigate the effect of each independent variable on dependent variable. Model 1 as a base model includes only year in order to examine the effect of control variable. Model 2 adds the effect of transaction-level determinants including platform age, platform dominance, and competition to the base model. Model 3 includes the effect of firm-level determinants including knowledge inimitability, asset portability, platform experience, and platform manufacturer and examines the incremental explanatory power compared with Model 2. Finally, Model 4 adds two interaction effects to Model 3. The full regression model is as follows:

\[
\text{SQRT(In-house game titles)} = \alpha + \beta_1 \text{platform age} + \beta_2 \text{platform dominance} + \beta_3 \text{competition} + \beta_4 \text{ln(knowledge inimitability)} + \beta_5 \text{ln(asset portability)} + \beta_6 \text{platform experience} + \beta_7 \text{platform manufacturer} + \beta_8 \text{(competition x platform dominance)} + \beta_9 \text{(platform experience x platform dominance)} + \beta_{10} \text{year(dummy variables)} + \varepsilon
\]

RESULTS

Table 1 below summarizes the descriptive statistics including means, standard deviations, and zero-order correlations of each variable (N=1060). The table shows that all the independent and control variables are significantly correlated to the dependent variable.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>S.D.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. SQRT(Make) - DV</td>
<td>3.475</td>
<td>2.088</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Platform Age</td>
<td>0.279</td>
<td>0.190</td>
<td>-0.083</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Platform Dominance</td>
<td>27.979</td>
<td>14.420</td>
<td>0.074</td>
<td>0.097</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Competition</td>
<td>-6.066</td>
<td>1.550</td>
<td>0.236</td>
<td>-0.011\textsuperscript{a}</td>
<td>0.658</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. ln(Knowledge Inimitability)</td>
<td>-1.786</td>
<td>2.621</td>
<td>0.319</td>
<td>0.033\textsuperscript{a}</td>
<td>-0.137</td>
<td>-0.183</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. ln(Asset Portability)</td>
<td>0.918</td>
<td>1.340</td>
<td>0.247</td>
<td>-0.076</td>
<td>-0.117</td>
<td>0.082</td>
<td>0.116</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Platform Experience</td>
<td>0.066</td>
<td>0.248</td>
<td>0.281</td>
<td>0.486</td>
<td>0.046\textsuperscript{a}</td>
<td>0.215</td>
<td>0.187</td>
<td>0.202</td>
<td></td>
</tr>
<tr>
<td>8. Platform Manufacturer</td>
<td>9.590</td>
<td>9.320</td>
<td>0.168</td>
<td>0.032\textsuperscript{a}</td>
<td>-0.157</td>
<td>-0.240</td>
<td>0.642</td>
<td>0.018\textsuperscript{a}</td>
<td>0.161</td>
</tr>
</tbody>
</table>

N=1060; \textsuperscript{a}: Not significant at p<0.05

Table 1. Descriptive Statistics and Matrix of Zero-Order Correlations

Table 2 shows the comparison of each regression model. Model 1 is the baseline model explaining the significance of control variable year on vertical integration of complementary goods. Model 2 adds the effects of transaction-level determinants as shown below. The adjusted R\textsuperscript{2} of model 2 increases from 0.046 to 0.072 (\Delta R\textsuperscript{2}=0.029, p<0.001). Model 3 adds the effects of firm-level determinants. The adjusted R\textsuperscript{2} increases to 0.273 and the incremental change in R\textsuperscript{2} is 0.201 (p<0.001). Model 4
adds the two interaction effects. The adjusted $R^2$ of model 4 increases to 0.284 ($\Delta R^2=0.013$, $p<0.001$). Also, the equations of all models are significant. These comparisons confirm that each group of variables significantly contributes to the variance of dependent variable.

<table>
<thead>
<tr>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>S.E.</td>
<td>Std. B.</td>
</tr>
<tr>
<td>(Constant)</td>
<td>1.062</td>
<td>0.070</td>
<td>0.718</td>
</tr>
<tr>
<td>Year 1991</td>
<td>-0.460</td>
<td>0.177</td>
<td>-0.084</td>
</tr>
<tr>
<td>Year 1992</td>
<td>-0.579</td>
<td>0.161</td>
<td>-0.118</td>
</tr>
<tr>
<td>Year 1993</td>
<td>-0.467</td>
<td>0.156</td>
<td>-0.099</td>
</tr>
<tr>
<td>Year 1994</td>
<td>-0.487</td>
<td>0.174</td>
<td>-0.090</td>
</tr>
<tr>
<td>Year 1995</td>
<td>-0.395</td>
<td>0.146</td>
<td>-0.091</td>
</tr>
<tr>
<td>Year 1996</td>
<td>-0.161</td>
<td>0.123</td>
<td>-0.046</td>
</tr>
<tr>
<td>Year 1997</td>
<td>-0.123</td>
<td>0.120</td>
<td>-0.036</td>
</tr>
<tr>
<td>Year 1998</td>
<td>-0.198</td>
<td>0.115</td>
<td>-0.062</td>
</tr>
<tr>
<td>Year 1999</td>
<td>-0.169</td>
<td>0.106</td>
<td>-0.060</td>
</tr>
<tr>
<td>Year 2000</td>
<td>-0.010</td>
<td>0.101</td>
<td>-0.004</td>
</tr>
<tr>
<td>Year 2002</td>
<td>0.235</td>
<td>0.100</td>
<td>0.091</td>
</tr>
<tr>
<td>Platform Age</td>
<td>-0.029</td>
<td>0.014</td>
<td>-0.065</td>
</tr>
<tr>
<td>Platform Dominance</td>
<td>-0.308</td>
<td>0.406</td>
<td>-0.063</td>
</tr>
<tr>
<td>Competition</td>
<td>0.017</td>
<td>0.006</td>
<td>0.267</td>
</tr>
<tr>
<td>Knowledge</td>
<td>0.189</td>
<td>0.021</td>
<td>0.316</td>
</tr>
<tr>
<td>Inimitability</td>
<td>0.046</td>
<td>0.010</td>
<td>0.130</td>
</tr>
<tr>
<td>Asset Portability</td>
<td>0.176</td>
<td>0.024</td>
<td>0.255</td>
</tr>
<tr>
<td>Platform Experience</td>
<td>-0.056</td>
<td>0.131</td>
<td>-0.015</td>
</tr>
<tr>
<td>Platform Manufacturer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competition x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Platform Dominance</td>
<td>-0.018</td>
<td>0.011</td>
<td>-0.185</td>
</tr>
<tr>
<td>Platform Experience x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Platform Dominance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>5.590</td>
<td>0.070</td>
<td>0.718</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.046</td>
<td>0.072</td>
<td>0.273</td>
</tr>
<tr>
<td>$\Delta R^2$</td>
<td>0.055</td>
<td>0.029</td>
<td>0.201</td>
</tr>
</tbody>
</table>

**Table 2. Regression Results**

H1 tests the negative relationship between platform age and make decision of complementary goods. The result shows that the unstandardized and standardized coefficients are -0.078 and -0.176 ($p<0.001$), which represents full support of the hypothesis. That is, as a platform gets obsolete, a videogame provider would develop less in-house game titles.
H2 tests the positive relationship between platform dominance and make decision. It is shown that the unstandardized (0.599) and standardized (0.123) coefficients are not significant. The result describes that there is no difference in a publisher’s make-or-buy decision regardless of the degree of platform dominance.

H3 tests the positive relationship between competition and make decision. It is shown that the coefficients are significant as expected (coefficients: 0.012 and 0.189, p<0.05). As the competition between publishers increases, a game publisher would more likely to develop in-house game titles.

H4 tests the positive relationship between knowledge inimitability and make decision. The result fully supports the hypothesis (coefficients: 0.188 and 0.315, p<0.001). As expected, the degree of knowledge inimitability is positively related to the degree of vertical integration.

H5 tests the positive relationship between asset portability and make decision. The result fully supports the hypothesis (coefficients: 0.042 and 0.120, p<0.001). As more portable assets a firm has, a firm is more likely to develop game titles in-house.

H6 tests the positive relationship between publisher’s platform experience and make decision. The unstandardized (0.054) and standardized (0.078) coefficients are not significant (p>0.05), representing no difference in a game publisher’s make-or-buy decisions according to the degree of its platform experience.

H7 tests the positive relationship between platform manufacturer and make decision of complementary goods. The result shows that the unstandardized (-0.003) and standardized (-0.001) coefficients are not significant. That is, even if a game publisher is a platform manufacturer, the company does not make more in-house game titles compared with third party game publishers.

H8 tests the interaction effect of competition and platform dominance on make decision. The results describes that the positive effect of competition is not moderated by the degree of platform dominance. Whether in a dominant or in non-dominant game platform, a game publisher would develop more in-house game titles in a competitive platform.

H9 tests the interaction effect of publisher’s platform experience and platform dominance on make decision. The result fully supports the hypothesis (coefficients: 0.483 and 0.238, p<0.001). In this case, a game publisher will more likely to develop in-house game titles when the company has substantial experience on a dominant platform. On the other hand, a game publisher would not be more vertically integrated when the company does not have sufficient experience on platform or such platform is not a dominant one.

DISCUSSION

Discussion of Results

From the results above, some of hypotheses are not supported, which requires further explanation. First, the result does not support the positive effect of platform dominance on make decision (H2). However, platform dominance can be understood as a moderator of other independent variables. The support of H9 represents that while platform dominance itself does not have a main effect it moderates the effect of publisher’s platform experience. At the same time, the rejection of H6 shows that platform experience by itself does not have a significant effect on a publisher’s make-or-buy decision. Thus, those two determinants are interrelated and should be understood together. Although the coefficient of platform experience in Model 3 is significant (0.176, p<0.001), the significance diminishes in the presence of the interaction effect of platform experience and platform dominance, which supports the argument. Therefore, it can be concluded that only game publishers with sufficient platform experience on a dominant platform would more likely to develop its in-house game titles.

Also, the positive effect of platform manufacturer on make decision of complementary goods is not significant, which means there is no difference in the degree of in-house games between platform manufacturers and third party game publishers. In fact, while Sony PlayStation2 currently dominates the market, the company releases only a few portions of its own game titles (e.g. 7.5% in 2002). However, due to the strong support from third party publishers, the platform currently dominates the market. It can be understood that there is no significant difference in game development capacity or preference between platform manufacturers and third party game publishers. In either case, it is shown that a platform manufacturer does not necessarily develop more in-house game titles than does a third party game publisher.

Finally, while the effect of competition per platform is positively related to the make decision in H3, such main effect is not moderated by the degree of platform dominance (not supporting H8). H8 initially expects that the effect of competition between rival publishers will be stronger in a dominant platform. Whether a platform is a dominant design or not, however, the positive effect of competition per each platform on make decision is found to be consistent.
Contributions

One of the contributions of this study is that it extends transaction cost theory with network effects and modularity to determine the make-or-buy decision by videogame publishers as complementors. This study empirically discovers the effect of modularity, specifically that of asset portability on make-or-buy decision. Also, this study empirically finds the potential relationship between indirect network effects and a complementor’s make decision. In the empirical results, platform dominance measured as the indirect network effects size, can play at least a role of moderator of other independent variables. Thus, the integrated approach of transaction cost theory, modularity, and network effects may give birth to various research topics such as the effect of modularity on organizational alliances. Simultaneously, the study may guide the project managers of videogames how to release their new game titles effectively.

Limitations

The study has several limitations. First, although TCT explains the choice between market and firm governance, various forms of hybrid and alliance governance actually exists (Williamson, 1991, 1996). In fact, it can be usually found that some of the game developers have an exclusive long-term relationship with major game publishers. The study does not cover the issues regarding the hybrid modes of governance, and leaves the room for future studies.

Second, the operationalization or measurement of variables might need to be revisited. In terms of the measurement of a firm’s knowledge inimitability with the accumulative number of patents, for example, it is shown from the data that only 29 videogame publishers out of total 188 publishers have at least one patent. One issue regarding the limitations of patents is that patents do not cover all categories of knowledge; generally they do not protect tacit knowledge despite that tacit knowledge might be more related to transaction costs and make decision (Schilling and Steensma, 2002). Therefore, a refined item to measure each variable will be required.

CONCLUSION

As a system platform changes dynamically, it is necessary to view such phenomenon from the view of complementors as well as platform providers. From the view of complementors, a firm’s make-or-buy decision in order to enter a new platform is critical for its success combined with the right choice of platform. As the number of complementors such as videogame publishers or even other software developers increases, the company’s decision will bear more research issues as well as managerial implications.

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REFERENCES


