Volume 15, Number 2

Print ISSN 1544-1458
Online ISSN 1939-6104

ACADEMY OF STRATEGIC MANAGEMENT JOURNAL

Editor

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HOW MERGERS ARE CHANGING BANKING LANDSCAPE

James B. Bexley, Sam Houston State University

ABSTRACT

Last year, this author examined the three major financial issues impacting the merger of banking institutions and found that median price to tangible equity, median price to earnings, and premium to core deposits were the monetary drivers. While there is no doubt that the financial drivers are important, it has become apparent from examining the literature, factors such as regulatory overreach, low interest rates, problem banks, management succession, and competition have become equally important. The financial issues and the economic issues have created perfect storm to drive more shareholders to seek shelter through the merger of their bank with another bank.

Key Words: *Banks, Mergers, Regulation, Acquisition*

INTRODUCTION

There has been a spike in bank mergers and acquisitions across the country in the past decade. Larger banks are merging, mid-size banks are buying smaller community banks, and community banks are merging with other community banks. What is causing all of this movement and consolidation? Why are there becoming fewer banking options? What are the benefits to these institutions merging? Some banks were acquired because they were in trouble and some were acquired for this reason and that they added market share and assets to larger stronger banks. Some bank mergers occurred to combined assets so that two smaller banks could merge and increase profitability. Increased regulations have also increased the cost associated with banks remaining compliant in today's highly regulated banking environment. Other banks look at mergers and acquisitions as an opportunity to grow and increase shareholder value. The recent economic downturn and the impact it had on the banks has contributed to making this a prime time for banks to be purchased. Recently in 2014 most of the mergers and acquisitions have involved smaller banks that have struggled. Now with the market improving there is a shift where valuations are increasing and stronger banks will also be seeing movement as well.

LITERATURE REVIEW

The literature to support regulation as a factor was driven basically by Cornett, et al (2006) who noted in their study that regulatory burden had a major impact in promoting merger activity. Banks that had problems or sought relief from the issues facing them, tended to look for a merger partner to take the over as note by Jagtiani (2008). Barth, et al (2012) examined the number and value of bank mergers and acquisitions both domestically and globally. While their main focus was global, they found that there were three main variables in completed transactions—the rule of law in the specific country, the level of discrimination, and bank domestic credit. Winkler, et al (2014) noted that the Dodd-Frank Act had given rise to a 41 percent increase in regulatory burden. Genay and Podjasek (2014) indicated that the perfect

storm was brought about by lower interest rates coupled with a slow recovering economy. Kowalik, et al (2015) examined the post crisis merger market and noted that acquired banks tend to be smaller, have lower earnings, regulatory issues, and less capital.

The above literature addresses on the single issues, however, there is no literature to date that addresses both the financial and economic issues as joint causal effects of merger motivation. This study will focus on pulling the issues together.

REGULATORY OVERREACH

The costly regulatory environment for financial institutions to remain compliant and keep up with regulatory operational requirements has drastically increased in recent years. Unfortunately, it is expected to increase as the Dodd-Frank Act is fully implemented. This has put .an additional burden on smaller financial institutions. Part of these costs has to do this with back office, paperwork, and monitoring requirements attached to the new regulations. Many banks, large and small, are having to hiring additional employees and enhance technology to remain compliant. "The Act imposed 398 new regulations that have thus far added more than $21.8 billion in costs and 60.7 million paperwork burden hours. These measures have transformed the financial industry, overhauled mortgage lending, and directly affected the availability of credit. With roughly one-quarter of the law still left to implement, it's safe to say that the true economic impacts won't be understood for years." (Winkler, et al, 2014) The increase of cost for this regulation is expected to be around 41%.

While Dodd Frank was implemented to fix abuse and systematic weaknesses in the financial sector, it has had the opposite effect. The burdensome costs have reached beyond the financial sector to consumers and businesses. Due to the increased cost to comply with Dodd Frank, this has driven up fees and loan pricing passed on to the consumer. Part of the reason for increased mergers is with the increase in cost regarding regulations like Dodd Frank, smaller banks are not able to keep the same margins thus sell to stronger banks. This is because under Dodd Frank banks have faced increased cost of compliance, increased cost of raising capital standards, and regulatory uncertainty.

It should also be noted that most of the most expensive regulatory changes have nothing to do with the causes of the economic downturn. Much of the Dodd Frank requirements have to do with paperwork and the cost with the millions of hours of paperwork has not been consistently documented. Due to this, the heavy cost associated with Dodd Frank are often not realized by most people outside the financial industry. Dodd Frank is continually changing from updated revisions. More than 80 percent of banks have reported an increased compliance cost caused by Dodd Frank of 5%. "Increased compliance costs include the need for outside expertise, additional staff, and time spent on additional paperwork. In the survey, many small banks reported the need to trim back or eliminate some products and perks offered to customers, especially with regard to residential mortgages, home equity lines of credit, overdraft protection, and credit cards." (Winkler, et al, 2014).

Expectations are that the new regulations are ultimately going to restrict credit availability due to the risks associated with the uncertainty in these new regulations. This not only affects consumers and small businesses, but also affects the banks' ability to generate income. Dodd-Frank has cost the financial services industry 60.7 million in paperwork burden hours and costing them more than $21 billion. While Dodd-Frank is supposed to limit risk, most of the smaller firms are paying the price with stagnant job growth and being more susceptible to mergers and acquisitions. The financial industry as a whole has struggled since 2010. What is

interesting is that many of the small financial businesses, small community banks, have struggled since the passage of Dodd-Frank. Yet the larger banks and financial institutions with 1000 or more employees have grown 10.2%. It appears the smaller firms are absorbing and feeling most of the regulatory burden.

Another regulatory change was the implementation of the Consumer Financial Protection Bureau which was started a little over five years ago. This adds additional costs and paperwork hours to the burden placed on banks. The law is becoming increasingly more costly on financial institutions as agencies implement more and more costly rules and regulations. Part of the struggle, especially with the smaller banks is the restriction of products resulting from these new regulations in addition to the increased costs. There is still one quarter of the regulation left to implement so one can only assume the costs and burden will continue to increase. When these regulations where initially passed they were targeting the larger institutions, it is the smaller institutions that are truly being negatively impacted. This has led to smaller banks merging together to increase in size to remain profitable throughout this costly time.

In a study conducted by Peirce, et al (2014) at the Mercatus Center at George Mason University the following data was gathered from a sample of banks surveyed. In regards to increased compliance cost, most of the banks surveyed see Dodd-Frank and more burdensome than the Bank Secrecy Act. Staff typically was increased in small banks from one to two to handle the regulatory aspect. More than a quarter of the banks planned on hiring additional compliance staff in the next year. Smaller banks are planning on cutting products and services due to Dodd- Frank. Mortgage, home equity, and overdraft products are the primary products that are looking to be affected. This also affects revenue. "More than a quarter of respondents anticipate engaging in a merger or acquisition in the near future, which would reduce the number of small banks.. "(2014, Peirce, et al).

Banks are monitored differently depending on their size. Banks under 1B are monitored one way. $1-5B another way, $5-50B differently, and $50B plus all have the unique measures. Sometimes mergers are done not only for economies of scale but to push banks into a different regulatory bracket. Banks also responded notating that regulatory costs rather than helping consumers are negatively impacting customers. Small banks play an important role in serving small communities, small businesses, and borrowers with unique needs and due to these increased regulations are having to merge and be acquired to survive therefore the number of small banks in on the decline.

LOW INTEREST RATES

Financial institutions exist on the spread between what they pay for money and what they can charge for money. As simple as this may sound, it is the driving issue to bank profitability. A good place to begin is with the financial collapse of 2008 and the events leading up to it. Prior to the collapse, both regulations and the free market encouraged as many people to buy homes as possible. A saturated home ownership market and rising interest rates (such as the Federal funds rate hitting 5.25% in 2006) led to a decline in home construction categories. Additionally, the environment forced many subprime borrowers into default as they could not keep up with rising interest rates. As many financial institutions packaged their subprime notes and sold into the secondary market, the defaulting loans had an immediate effect.

In the first quarter of 2007 alone, the world mourned the announcement of the bankruptcy of 25 subprime lenders. Additionally, many investment vessels, such as hedge funds, began announcing major losses as a result of previous investments in the subprime mortgages. By the

end of the year, countries world-wide were coordinating in a way never before seen in an attempt to stave off the impending financial tragedy. The Fed responded in the way they knew best; dropping the Federal funds rate. By 2008, the rate was dropped down to 1%, 4.25% lower than just 2 years earlier.

Banks found it very difficult to make a profit with interest rates so low. This was compounded by the decline of the stock market leaving the public with the only safe place to put their deposits was the banking system. Banks taking the deposits, for the most part had no place to loan their money since the economy had substantially dried up the lending market. The deposits had to be backed by additional capital. Banks suddenly did not need these excess deposits. Without lending sources and low rates, many banks sought a merger partner to bail them out of their problems.

PROBLEM BANKS

Motley and Harahan (2009) in light of the 2008 Financial Crisis evaluated the largest 50 of the 73 de novo banks chartered in 2008 and examined their results after one year of operation. The results were impactful with only three of the banks reporting a profit while in the remaining 47 de novo banks of the 50 total, one bank reported a negative return of 23.33 percent, two others had a negative 9 plus percent return, and most of the remainder on average reported a negative 4.00 percent return. A negative return of average assets over a several year period would erode the capital which would seriously impact a bank's ability to continue to be solvent. The opposite was true of banks in the pre-crisis era resulting in the 50 largest de novo banks in a study prepared by Mazur and Cope (2007) wherein they reported that 20 of the 50 largest de novo banks chartered in 2005 were profitable after one year in 2006. Only one de novo bank reported a negative return on average assets of over 4.00 percent. From these examples, it is obvious that the financial condition was a major factor in post crisis charter de novo banks.

As a result of the crisis, Glasser (2009) noted in an article that the Federal Deposit Insurance Corporation issued a letter to all de novo banks that extended special reporting and examinations from five years to seven years. It was noted that the extension means banks will continue to be subjected to higher capital requirements, supervised lending limits, and more frequent examinations. The issue behind this extension was more than 80 banks failures in 2009 with approximately 20 percent in operation less than 7 years. Regulators believe this extended time close supervision will tend to help reduce de novo bank failures.

Approximately 800 de novo banks opened since 2002, and Terris (2011) found that some 9 percent have failed. He said, "Banks that were established from 2005 through 2007, just before the onset of the deep depression, had slower ramp-ups to profitability than the de novos of previous years. But failures have been more frequent among banks launched from 2002 to 2004. Nearly 17 percent of the banks established in 2003 have failed…." (Page 14). According to Genay, et al (2014) "…the severe recession triggered by the financial crisis and the subsequent slow recovery have led to lower expected real returns from investments." While it is known that low interest rates and flat yield curves can negatively impact banks' profits, what really causes these to impact banks is when they are combined with declining economic conditions. Low interest rates for the long term can have a positive effect on the economy which can drastically increase a banks profit so this ties into what occurred in the past years. The banks that could weather the storm did and now that the economy is improving are going to be in a position to thrive and prosper. This will also make them prime for being purchased as well if they wanted to sell.

MANAGEMENT SUCCESSION

Few organizations, including banking institutions have a firm plan of management succession. Many will note that they do not want to have the staff to know who will succeed the chief executive officer or one of the other "C" level officers. When the time comes due to death, resignation, retirement, or other reasons, most organizations have to rethink whether they have a qualified replacement or whether or not it might be advisable to put the bank on the merger market. Leadership to guide the organization is a very critical issue, as evidenced by seeing banks that lose a leader and cannot seem to keep the bank on course with replacement management.

COMPETITION

Bank expansion has long been a significant cause of bank mergers. Just because a bank has a branch in a large metro market does not mean that it has completed all market expansion in that area. In large cities, it may take many branches to effectively compete for the banking business and further, in order to service the entire market area.

When a bank decides they want to service a new part of the same service area, they must decide many of the same things as if they were moving to a completely new city. In short, they can merge with an existing competitor in the target market, or they can start up a new branch and grow the market share organically. If a bank is looking to quickly make an impact on market share, quickly increase net income, and quickly have a new branch fund its own expenses through the loan portfolio of that target location, then often times the best course of action would be to merge with an existing competitor.

In a similar vein, many banks may consider mergers in order to grow into a completely new market area. A well-capitalized bank that has a strong management team may decide after much research, that the shareholders and directors believe it would be in the bank's best interest to expand into a new market. At this point, assuming they do not mind paying a premium, their most likely course of action would be to merge with an existing bank group that has branches in all or most of the target market areas in the state.

Another common reason for Merger activity is to protect a bank's existing market share. For example, a large community bank might enjoy its significant market share in its operating area for a number of years. If some new bank moved into the area and started poaching good customers, the larger, more established bank might consider merging with that bank as a way to prohibit any further loss of market share. However, if the larger bank did not feel the newer bank was a threat, then it might wait and see if that bank can compete. However, this could prove a costly mistake if the larger bank makes any miscalculation. Therefore, banks that act to protect their market share must be very diligent in their research and background information of the target bank.

Still another traditional reason for a bank merger is to correct some banking ratios that may have moved outside of their target ranges. For example, assume that some critical ratios such as its loan-to-deposit ratio, liquidity ratio, net interest margin ratio, or other ratios are out of line.

The bank begins to make a number of internal changes with the aim of dropping the ratio down to the acceptable range. However, these changes will take quite some time to work through the system and the bank executives search for a faster alternative. At this point, the large community bank would attempt to merge with a bank that would balance the ratios, and combine

the new bank's high liquidity with the older, more mature bank's deposit portfolio. If all goes as intended, the result will be a nice return for the shareholders of the acquired bank, a new location or two for the acquiring bank, and a much needed injection of deposits into the framework of the existing larger bank.

Another potential reason for a merger is for income or cost diversification. Jagtiani (2008) summarized the crux of diversification. "…through diversifying mergers, the combined banks would benefit from reduced earnings volatility and default probability. The opposite of this idea is the focusing hypothesis, which predicts that mergers between similar banking firms would create more value by allowing the merging firms to concentrate in the narrow area in which they both do best" (Page 35). In other words, while an example of the focusing hypothesis would be for a niche bank to buy a similar niche bank, diversification hypothesis allows very different banks to merge as a way to increase confidence and decrease risk associated with total income. Merging two difference income streams could be likened to why a stock portfolio has multiple stocks, not just one single asset. By diversifying the income streams, shareholders and executives can feel confident that their bank does not live or die based off of one income stream.

The final noted reason for bank mergers is simply take advantages of efficiencies and inefficiencies of separate banks. Generally, the purchasing bank is more efficient across the board, and is looking to purchase an inefficient bank that it can "fix". For example, perhaps a purchasing bank has an extremely efficient loan operations department that has capacity to handle more loan volume. Their target might be an inefficient bank that has good loan production with good asset quality, but high loan operational overhead expenses. By merging with the inefficient bank, the purchasing bank can absorb the existing income while cutting a significant portion of the costs.

Since Jagtiani's article is slightly dated (being published in 2008), a reasonable person might question if his findings, and perhaps all of the listed traditional reasons for mergers, are still applicable to modern times. Kowalik,et al (2015) published an article just this year addressing many of the key traditional reasons for mergers. In short, yes; all of the listed traditional reasons for mergers are still as relevant as ever.

Their conclusions, based on the four years from 2011 to 2014, seem to match exactly what has been seen historically. Kowalik,et al (2015) noted "… the mergers of community banks over the past four years and finds they are consistent with the goals of achieving greater economies of scale and improving efficiencies. Acquired banks tend to be smaller and have a lower return on assets, lower net interest income, and higher non-interest expenses than non-acquired banks. Acquired banks may be less profitable because they tend to have lower loan and higher cash and deposit shares. In addition, the condition of acquired banks tends to be worse than their industry peers in terms of capital, supervisory examination ratings, and problem loans and assets. Among the characteristics that differentiate acquired banks, statistical analysis suggests profitability and efficiency are the most important factors"

CONCLUSION

The current banking environment is unlike anything the industry has seen before. The costly regulatory environment for financial institutions to remain compliant and keep up with regulatory operational requirements has drastically increased in recent years. Unfortunately, it is expected to increase as the Dodd-Frank Act is fully implemented. This has put .an additional burden on smaller financial institutions. Part of these costs has to do this with back office, paperwork, and monitoring requirements attached to the new regulations. Many banks, large and

small, are having to hiring additional employees and enhance technology to remain compliant. "The Act imposed 398 new regulations that have thus far added more than $21.8 billion in costs and 60.7 million paperwork burden hours.

Low interest rates impact bank spreads and is the driving issue to bank profitability. A saturated home ownership market and rising interest rates (such as the Federal funds rate hitting 5.25% in 2006) led to a decline in home construction categories. In the first quarter of 2007 alone, the bankruptcy of 25 subprime lenders shocked the nation's financial system. Additionally, many investment firms, such as hedge funds, began announcing major losses as a result of previous investments in the subprime mortgages. By the end of the year, countries world-wide were coordinating in a way never before seen in an attempt to stave off the impending financial tragedy. The Fed responded in the way they knew best; dropping the Federal funds rate. By 2008, the rate was dropped down to 1%, 4.25% lower than just 2 years earlier. Banks found it difficult to operate profitably at these low rates.

Loans started going bad as the Crisis of 2008 brought about many foreclosures, business closures, and personal bankruptcies. As a result, many banks had reserves that became depleted with all of the loan losses. Banks that had problems were forced to recapitalize, sell, or be closed by the regulatory authorities. Merger, if possible, was probably the best solution.

When the time comes due to death, resignation, retirement, or other reasons, most organizations have to rethink whether they have a qualified replacement or whether or not it might be advisable to put the bank on the merger market. Leadership to guide the organization is a very critical issue, as evidenced by seeing banks that lose a leader and cannot seem to keep the bank on course with replacement management. Again, many banks choose merger with a well-run organization as the best option.

Intense competition exists in the financial arena; therefore it is critical that a bank has all of the tools that it needs to be able to effectively compete. Competition may be the cause for banks to consider mergers in order to grow into a completely new market area. A well-capitalized bank that has a strong management team may decide after much research, that the shareholders and directors believe it would be in the bank's best interest to expand into a new market. Conversely, a bank that is under-capitalized and limited in its ability to compete may choose to merge with a strong bank.

Mergers will continue to be a major concern for the banking industry as it deals with regulatory burden, problem banks, management succession, low interest rates, and competition. Both financial and economic issues will drive merger activity in the future.

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EXPANDING THE COMPETITIVE PROFILE MATRIX (CPM): INTRODUCING THE FINANCIAL COMPETITIVE PROFILE MATRIX (FCPM)

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ABSTRACT

Capps and Glissmeyer (2012) proposed an extension to the Internal Factor Evaluation (IFE) and External Factor Evaluation (EFE) matrices that included an Internal Competitive Profile Matrix (ICPM) and an External Competitive Profile Matrix (ECPM) that uses a forced ranking which provides greater depth of understanding to the internal and external categories to which organizations must attend. Cassidy, Glissmeyer and Capps (2013) visually mapped an Internal-External (I-E) Matrix using traditional and extended techniques to enable greater comparative understanding of the relative strengths, weaknesses, opportunities, and threats of respective companies in an analogous Company Comparison Internal-External (CCI-E) Matrix. Because of the different points plotted when mapping it seems adjustments are needed using both methods. Due to the additional insights provided by extending the competitive profile matrix (CPM) concepts, a more thorough understanding should be possible by constructing a CPM for each functional area of business. Thus, this paper focuses on the functional area of finance and introduces the Financial Competitive Profile Matrix (FCPM), which provides a greater depth of understanding in the functional area by providing a more detailed analytical matrix tool to the basic strategic management decision-making process, especially if the point of the process is to not overlook something of major importance that may impact the firm.

Key Words*: Performance Measurement, Competitive Profile Matrix, Internal Factor Evaluation Matrix, External Factor Evaluation Matrix, Internal-External Matrix, Strategic Decision-Making, Strategic Decision-Making Analytical Tools*

INTRODUCTION

There is always need to advance analytical tools used in the strategic decision-making process (Fleisher and Bensoussan, 2003, 2007; Chang and Huang, 2006; Bygrave and Zacharkis, 2010; Capps and Glissmeyer, 2012; Cassidy, Glissmeyer and Capps, 2013; Capps & Cassidy, 2015). Capps and Glissmeyer (2012) advanced the strategic decision-making process by creating the ICPM and ECPM for added insight. Cassidy, Glissmeyer and Capps (2013) visually mapped an I-E matrix using both traditional and extended concepts. This produced different plotting points; sometimes the result was also a different cell assignment. These different approaches provided extra insight, but also suggested questions: would a CPM based on a business function provide more insight due to improving the thoroughness of the strategic management decision-making process? And, what should be included in these business functional areas to improve the analytical strategic decision-making process. This paper addresses these two questions and strives for a more in-depth understanding of the strategic decision-making process? We begin

with a review that includes examples of traditional and extended concepts and then introduce the first new functional matrix: the Financial Competitive matrix (FCPM).

EXAMPLE RESULTS OF NEW AND OLD PARADIGMS

When the plotted points are determined using both the traditional and extended methods, outcomes frequently differ and the end result can be another cell assignment when mapped on the Internal-External (I-E) matrix. Please note examples below (See Tables 1 through 5 and Figure 1).

Table 1
TRADITIONAL METHOD TO COMPETITIVE PROFILE MATRIX (CPM) FOR FOUR HYPOTHETICAL FIRMS

		Company 1		Company 2		Company 3		Company 4	
Critical Success Factors	**Weight**	**Rating**	**Score**	**Rating**	**Score**	**Rating**	**Score**	**Rating**	**Score**
Advertising	0.20	1	0.20	4	0.80	3	0.60	3	0.60
Product Quality	0.10	4	0.40	3	0.30	2	0.20	2	0.20
Price Competitiveness	0.10	3	0.30	2	0.20	4	0.40	1	0.10
Management	0.10	4	0.40	2	0.20	3	0.30	2	0.20
Financial Position	0.15	4	0.60	2	0.30	3	0.45	3	0.45
Customer Loyalty	0.10	4	0.40	3	0.30	2	0.20	3	0.30
Global Expansion	0.20	4	0.80	1	0.20	2	0.40	1	0.20
Market Share	0.05	1	0.05	4	0.20	3	0.15	3	0.15
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Total	**1.00**		**3.15**		**2.50**		**2.70**		**2.20**

Table 2
TRADITIONAL METHOD TO EXTERNAL FACTOR EVALUATION (EFE) MATRIX FOR FOUR HYPOTHETICAL FIRMS

		Company 1		Company 2		Company 3		Company 4	
External Factors For Success	**Weight**	**Rating**	**Score**	**Rating**	**Score**	**Weight**	**Rating**	**Score**	**Rating**
The Competition	0.125	2	0.250	4	0.500	3	0.375	2	0.250
Economic Impact	0.125	4	0.500	4	0.500	1	0.125	1	0.125
Social-Cultural-Demo	0.125	4	0.500	2	0.250	4	0.500	2	0.250
Political-Legal-Govt	0.125	3	0.375	1	0.125	3	0.375	2	0.250
Natural Environment	0.125	3	0.375	2	0.250	1	0.125	3	0.375
Technological Change	0.125	4	0.500	1	0.125	3	0.375	3	0.375
Trends	0.125	2	0.250	1	0.125	2	0.250	3	0.375
Market Share	0.125	2	0.250	4	0.500	4	0.500	2	0.250
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Total	**1.00**		**3.000**		**2.375**		**2.625**		**2.250**

Table 3
TRADITIONAL METHOD TO INTERNAL FACTOR EVALUATION (IFE) MATRIX FOR FOUR HYPOTHETICAL FIRMS

Internal Factors For Success	Weight	Company 1 Rating	Company 1 Score	Company 2 Rating	Company 2 Score	Company 3 Rating	Company 3 Score	Company 4 Rating	Company 4 Score
Management Team	0.10	1	0.10	4	0.40	4	0.80	2	0.20
Org Structure/Culture	0.10	4	0.40	3	0.30	1	0.10	1	0.10
Distinctive Competency	0.10	3	0.30	2	0.20	3	0.30	1	0.10
Competitive Advantage	0.10	4	0.40	1	0.10	2	0.20	2	0.20
Operations	0.10	4	0.40	1	0.10	1	0.10	3	0.30
Marketing	0.10	4	0.40	1	0.10	2	0.20	4	0.40
Human Resources	0.10	4	0.40	1	0.10	2	0.20	4	0.40
Finance & Accounting	0.10	1	0.10	3	0.30	3	0.30	2	0.20
Information Tech/Sys	0.10	3	0.30	1	0.10	1	0.10	4	0.40
R&D	0.10	2	0.20	2	0.20	3	0.30	1	0.10
	------		------		------		------		------
Total	**1.00**		**3.00**		**1.900**		**2.600**		**2.400**

The Internal-External (I-E) Matrix is a portfolio management tool used to compare divisions of an organization in terms of revenue and percentage profit with respect to the IFE and EFE matrix scores. The I-E Matrix categorizes IFE as weak, average or strong on one axis, and categorizes EFE as low, medium, and high on the other axis. Revenue and percentage profit are displayed by division based on the size of the divisional marker within the matrix.

To better compare companies using the extended ECPM and ICPM measures, the authors developed a company comparison tool analogous to the I-E Matrix, the Company Comparison I-E Matrix (CCI-E Matrix). The matrix plots each company in terms of its ECPM on the vertical axis and ICPM on the horizontal axis (see Figure 1). In the example provided the relative superiority of each company could be compared to the others in terms of external factors, internal factors, or both. The example below clearly shows that company 1 is superior to company 4 in terms of both external and internal factors. It also shows that company 1 and company 3 are the same in terms of internal factors. A comparison of companies 2 and 3 show that company 3 is superior in terms of internal factors but that company 2 is superior in terms of external factors. Please note the differences between a traditional approach to company strategic analysis and improvements using the ICPM and ECPM in Figure 1. The squares indicate the traditional values obtained using the EFE and EFE values plotted on a standard I-E Matrix. The circles indicate the values obtained using the ECPM and ICPM values. The changes indicate the differences obtained by forced ranking and highlight discernments gained by the technique. Tables 4 and 5 illustrate the calculations of the new ECPM and ICPM. Figure 1 compares the plotted results of the traditional approach and ECPM and ICPM totals to illustrate the differences and benefits of the technique.

In the examples provided the relative superiority of each company using both methods can be compared to the others in terms of external factors, internal factors, or both. The examples show that company 1 is superior to company 4 in terms of both external and internal factors regardless of method used. It also shows that company 1 and company 3 are the same in terms of ICPM scores. A comparison of companies 2 and 3 show that company 3 is superior in terms of ICPM but that company 2 is superior in terms of ECPM. The changes indicate the differences obtained by forced ranking and highlight the additional insights gained by the method. While the same information can be derived from the tabular data provided in Tables 4 and 5, the CCI-E Matrix puts all the information together for ease of visual comparison. As such it provides better

visual communication of data and additional insight for strategic analysts and intended audiences.

Table 4
EXTERNAL COMPETITIVE PROFILE MATRIX (ECPM) METHOD FOR FOUR HYPOTHETICAL FIRMS

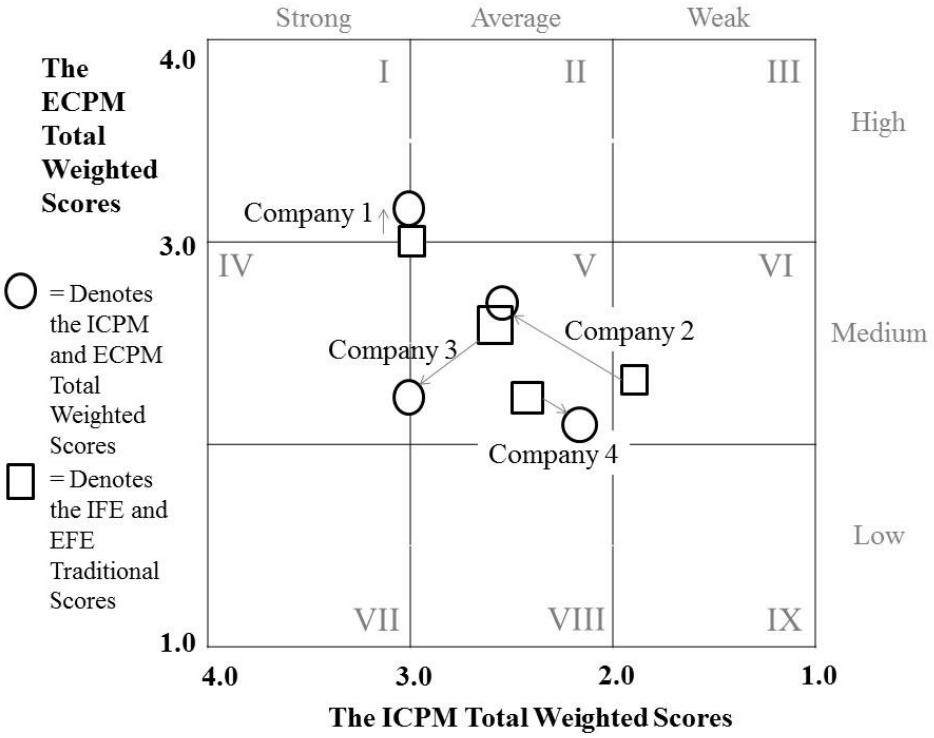
External Factors For		Company 1		Company 2		Company 3		Company 4	
Success	**Weight**	**Rating**	**Score**	**Rating**	**Score**	**Weight**	**Rating**	**Score**	**Rating**
The Competition	0.125	1	0.125	4	0.50	3	0.375	2	0.25
Economic Impact	0.125	4	0.50	3	0.375	2	0.25	1	0.125
Social-Cultural-Demo	0.125	3	0.375	2	0.25	4	0.50	1	0.125
Political-Legal-Govt	0.125	4	0.50	1	0.125	3	0.375	2	0.25
Natural Environment	0.125	4	0.50	2	0.50	1	0.125	3	0.375
Technological Change	0.125	4	0.50	1	0.50	2	0.25	3	0.375
Trends	0.125	4	0.50	1	0.125	2	0.25	3	0.375
Market Share	0.125	1	0.125	4	0.50	3	0.125	2	0.25
	------		------		------		------		------
Total	**1.00**		**3.125**		**2.75**		**2.25**		**2.125**

TABLE 5
INTERNAL COMPETITIVE PROFILE MATRIX (ICPM) METHOD FOR FOUR HYPOTHETICAL FIRMS

Internal Factors For		Company 1		Company 2		Company 3		Company 4	
Success	**Weight**	**Rating**	**Score**	**Rating**	**Score**	**Rating**	**Score**	**Rating**	**Score**
Management Team	0.10	1	0.10	4	0.80	3	0.60	2	0.20
Org Structure/ Culture	0.10	4	0.40	3	0.30	2	0.20	1	0.10
Distinctive Competency	0.10	3	0.30	2	0.20	4	0.40	1	0.10
Competitive/ Advantage	0.10	4	0.40	1	0.10	3	0.30	2	0.20
Operations	0.10	4	0.40	2	0.30	1	0.10	3	0.30
Marketing	0.10	4	0.40	1	0.10	2	0.20	3	0.30
Human Resources	0.10	4	0.40	1	0.20	2	0.30	3	0.30
Finance & Accounting	0.10	1	0.10	4	0.20	3	0.30	2	0.20
Information Tech/Systems	0.10	3	0.30	1	0.10	2	0.20	4	0.40
R&D	0.10	2	0.20	3	0.30	4	0.40	1	0.10
	------		------		------		------		------
Total	**1.00**		**3.00**		**2.60**		**3.00**		**2.20**

The extensions above are logical and theoretically sound, but also need to be validated with empirical data samples and constructed data sets intended to test the utility of the model. However, we recognize the CCI-E Matrix as a valuable strategic analytical matrix tool that complements the expanded CPM matrices developed by Capps and Glissmeyer (2012). It converts the data into a sharper strategic picture that allows for easy comparison of all companies in the analysis. It helps to more easily incorporate and interpret ECPM and ICPM in strategic analysis, so executives can better plan to improve a company's competitive advantage. Please see Figure 1 below:

Figure 1
COMPANY COMPARISON I-E (CCI-E) MATRIX USING ICPM AND ECPM FOR THE FOUR HYPOTHETICAL COMPANIES



Taking the strategic management decision-making process to the next level of analysis requires focusing on all the functional areas of business: operations, marketing, finance, human resources, information technology, and research and development. Thus, the authors begin by introducing the Financial Competitive Profile Matrix (FCPM). Please see Figure 2 below for the Financial Competitive Profile Matrix (FCPM).

Table 6
INTRODUCING THE FINANCIAL COMPETITIVE PROFILE MATRIX (FCPM) FOR FOUR HYPOTHETICAL FIRMS

Critical Success Factors in		**Company 1**		**Company 2**		**Company 3**		**Company 4**	
Finance	**Weight**	**Rating**	**Score**	**Rating**	**Score**	**Weight**	**Rating**	**Score**	**Rating**
Revenue	0.10	1	.10	2	.20	3	.30	4	.40
Profit Margin	0.10	2	.20	3	.30	1	.10	4	.40
Quick Ratio	0.10	4	.40	3	.30	2	.20	1	.10
Current Ratio	0.10	3	.30	2	.20	1	.10	4	.40
Return on Investment (ROI)	0.10	2	.20	3	.30	1	.10	4	.40
Return on Equity (ROE)	0.10	2	.20	3	.30	1	.10	4	.40
Return on Assets (ROA)	0.10	3	.30	1	.10	4	.40	2	.20
Earnings Per Share (EPS)	0.10	1	.10	3	.30	2	.20	4	.40
	------		------		------		------		------
Total	**1.00**		**2.00**		**2.70**		**2.10**		**3.20**

ADJUSTMENTS AND EXPLANATIONS

The basics of the FCPM are presented above. Adjustments certainly may be made weighting the ten financial factors differently based on industry or uniqueness. The authors' prefer forced ranking when rating the factors. A FCPM forces a more complete standardized evaluation that highlights major differences. The FCPM is useful to strategic management students as they learn to make the strategic management decision-making process more thorough.

SUMMARY AND CONCLUSION

This paper reviewed previous extensions, the ICPM, ECPM and CCI-E. Then the Financial Competitive Profile Matrix (FCPM) was introduced as a logical expansion to a CPM. The authors offered a Financial Competitive Profile Matrix (FCPM) as an example in Figure 2. Our conclusion is simple. We next address all functional areas of business by creating a CPM for each. A CPM for every functional area will provide improved analytical understanding and advance the strategic management decision-making process. The analytical decision-making process is an important aspect of strategic management. Not overlooking data is vital. A FCPM helps prevent this.

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PROTECTING INFORMATION: ACTIVE CYBER DEFENCE FOR THE BUSINESS ENTITY: A PREREQUISITE CORPORATE POLICY

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ABSTRACT

Corporations have the ability to collect a vast array of information, conduct analysis on the information, and profoundly influence the private lives of their customers. Those customers are also citizens. Using social contract theory, cybersecurity, and deterrence theory, this exploratory research examines the interface of citizens, governments, and corporations. It further seeks to determine if the corporate policy makers and managers are prepared to activate counter offensive cyber defence strategies to protect the information asset. This paper considers only the quantitative aspects of measurement that may lead to activation strategies by corporations. In a small sample size, findings indicate corporations have the ability and the technical competency to activate cyber defence strategies, though little hesitant to activate defensive actions due to statutory and legal issues and operational consequences that may be detrimental to the business entity.

INTRODUCTION

We now live in a period of time where the flow of information and protecting that information involves corporations and governments (Castell, 2009; Hood & Galas, 2003; Keyl, 2002). This period of time has been characterized as the "Information Age" (Floridi, 2002). The essence of the Information Age is captured succinctly by Bruce, Hick, and Cooper (2004) in their opening comments about the role of information in contemporary society and its impact within the corporate environment.

> *Information is the most valuable commodity in the world. It's more valuable than money, for with it one can make money. It's more valuable than power, for with it one can achieve power. It's more valuable than goods, for with it one can build, acquire, and improve goods. In any business, in any industry, in any part of the world, the right information is absolutely priceless. (Bruce, Hick, & Cooper, 2004, p. 11)*

Webster (2006) proposed that the "information society" is subject to abuse, threats, and could be used to cause harm to the individuals who surrendered their personal information to the corporation. This harm has been variously estimated to cost each identity theft victim approximately $1,600 (USD) (Baum, 2007) to recover from identity theft. For corporations the cost of cybercrime is expensive.

According to Ponemon Institute (2012) investigations, incident recovery, and victim payments doubled between 2010 – 2012 (Table 1), and expect to increase for the foreseeable future.

Table 1 CYBER SECURITY BREACH COSTS			
YEAR	**Days**	**COST/DAY**	**Cost / Incident**
2012	24	$24,475	$591,780
2011	18	$22,986	$413,789
2010	14	$17,696	$247,744

Source: Ponemon Institute LLC. (2012). Aftermath of a data breach study. Traverse City, MI: Ponemon Institute.

IBM's 2015 study of the corporate data breach costs "for each lost or stolen record containing sensitive and confidential information increased 6 percent, jumping from $145 in 2014 to $154 in 2015. The lowest cost per lost or stolen record is in the transportation industry, at $121, and the public sector, at $68. The retail industry's average cost increased exponentially, from $105 last year to $165".

In response to these concerns a growing cybersecurity industry, corporations, science and computer science researchers have developed a number of tactical and strategic responses such as firewalls, encryption, and software tools (Hopkins, 2011; Lachow, 2013; Public Safety Canada, 2011) to protect information assets. Despite the level of success, these tactical and strategic responses have caused frustration. The cyber criminals continue to steal information, damage corporate assets, seemingly, without any consequence (Public Safety Canada, 2011). This has caused the corporations to seriously assess the relevancy and effectiveness of their cyber protection policies and possible activation of corporate cyber-defensive strategies against cyber criminals.

One possible alternative to current cybersecurity practices is to develop and utilize an active cyber defence (ACD) strategy. ACD is a series of technological and socially engineered tactics which focus on deterring the cybercriminal. ACD relies on hacker techniques such as hack backs, denial of services attack, malware deployment, and ransomware. In other words corporations and governments would use the same technologies a cybercriminal uses when attacking.

Dogrul, Aslan, and Celik (2011) defined cyber deterrence as the "proactive measures that are taken to counter cyber-terrorism activities. The mission of cyber deterrence is to prevent enemies from conducting future attacks by changing their minds, by attacking their technology, or by more palpable means such as confiscation, termination, incarceration, casualty, or destruction" (p. 39). However, the current legal environment clearly prevents corporations from engaging in ACD.

This paper explored the following questions:

1. Are corporations and governments willing and able to conduct active cyber defence operations?
2. If active cyber defence were legalized would corporate decision makers conduct ACD?

PROTECTING THE INFORMATION SOCIETY

Castell's (2010) study of networked societies and Hopkins (2011) study of protecting the information society revealed that it was necessary to understand how society constructs "cybersecurity" as a social phenomenon. Within the scope of cybersecurity is corporate network security, cybercrime, and information security. All of which consists of someone using technology as a tool to commit a crime against a person, information asset, intellectual asset, or

physical component of society (financial systems, medical devices, automobiles). The scope of the cybercrime, therefore, can include: physically visiting the site and gaining access to the room where the data are stored; virtually or physically moving from one computer network to another computer network; and some form of social contact such as email request for information or a phone call asking for specific usernames and passwords.

Active Cyber Defence

Baker (2013) discussing the ACD as a policy option, told the US Senate Subcommittee on Crime and Terrorism (May 8, 2013) "…we can't defend our way out of this fix…. (n.p.)". Referring to the continued reliance on passive cybersecurity practices such as firewalls, password protecting, and encryption.

Protecting information asset(s) within a corporate entity is accomplished using a robust design of networks and software, and the use of technology such as firewalls, and encryption; human resourcing, and physical security components, is a major challenge. These security tasks include training employees on how to create strong passwords, building rooms and offices which have strong doors, walls, and two or three levels of user authentication to gain access to premises and computer systems. These forms of access typically include user authentication via biometrics (fingerprint scanning, retina scans), special designated keys, and specific permissions to work in secure locations. One other method of protecting in the information society is called, active cyber defence.

Currently, only government organizations have capabilities to conduct offensive cyber operations which are known as active defence operations (Armistead, 2004; West, 2012). Examples of governments conducting these operations include Stuxnet, Russia's alleged involvement in the Estonia cyber-attacks, and China's attack on Google. However, companies have also engaged cybersecurity contractors to conduct active defence operations known has hackbacks (Menn, 2012), even though this may be illegal in United States and other jurisdictions. This decision to hackback appears to be linked to the emerging active defence discourse (Lachow, 2013). To reframe ACD, it is summed up as "attack the attackers".

The extent of ACD use in the corporate environment is subject to debate. While Menn indicated corporations have the ability and capacity to undertake ACD strategies, Bejtlich (2014) and Lachow, (2013) have quantified the extent of this practice. Lachow (2013) claims 36% of the 180 organizations surveyed conducted active defence operations. A detailed analysis of the original article by nCircle (who conducted the survey) shows that nCircle asked "have you ever engaged in retaliatory hacking?" Further analysis of the nCircle (2012) article revealed that the survey sample is from BlackHat conference attendees, not necessarily representing individual organizations. The attendee's statements still reveal an interesting trend; 64% said never, 23% once, and 13% said frequently. A similar study was also completed by Cyber Security Index (Bejtlich, 2014).

Bejtlich (2014) cites the formation of a Cybersecurity Index. This study notes the survey was distributed to approximately 200 corporate members. The authors of the Cyber Security Index confirmed that the survey data is accurate, but the data were not linked to specific demographics. Working from the premise that the survey is valid, the survey has profound implications. 8% of the respondents indicate that they conduct active cyber defence operations. Similarly, cybercrime victims groups such as "Artists Against 419," are mobilizing victims around the world to strike back (Rigakos, 2012). In otherwords, both surveys confirm active cyber defence is being utilized.

All within the existing of corporations and information security is a component of the social contract referenced by Obama. Is it possible we are now moving to a new model of safety and security as defined by social contact between government, citizens, and corporations?

SOCIAL CONTRACT THEORY: GOVERNMENTS, CORPORATIONS, AND INDIVIDUALS

Social Contract Theory (SCT) encompasses "the view that persons' moral and/or political obligations are dependent upon a contract or agreement among them to form the society in which they live."(Friend, 2004, np). SCT evolved from the intellectual movement established by Plato and Aristotle's original civil society arguments and continued through to the present iteration of Rawls' Sense of Justice (SofJ) framework (Rawls, 1963; Ritchie, 1891).

Currently, the Internet Security Alliance (2008) report to the Obama Administration and 111th Congress references the "larger social good" that government and industry must address when considering new information security services. These services are designed to protect commerce, food, water, investments, and public interest (p. 2 -5). The implication of this new social contract is not lost government, corporations, and citizens/consumers.

For example, food, water, and shelter are scarce resources which require redistribution so that all members of society may benefit. Extending the scare resources argument to the information society may seem odd until one reflects on the exponential volume of data which is a representation of food, water, shelter, clothing, natural resources, and law. These data about the public resources are no longer the sole purview of the decision makers who are able to exert State control and security mechanisms to protect data. Instead, the data are now protected and secured predominately by corporations and their decision makers.

Moreover, Arquilla (2012) notes that the interface between government and corporations influences the critical infrastructure (electric power, natural gas, and water dams) which society heavily relies upon. In other words, securing the information is a corporate responsibility which is linked to tactical and strategic objectives within national security domain which is tasked with protecting society at large.

Deterring the Cybercriminal

Criminals who use computers to attack other computer networks or to steal information are called cybercriminals. Given the predominate reliance on information to secure food, water, clothing and shelter deterring the cybercriminal is a critical to ensure a safe and secure information society. This section will introduce the sense of justice framework to model deterrence. The contemporary iteration of SCT, is the Sense of Justice (SofJ) developed by Rawls (2008). According to Krebs (2011), Rawls' Sense of Justice is an evolutionary process by which individuals or groups "distribute resources in fair ways (distributive justice), to honor the commitments they make to others (commutative justice), to punish cheaters (corrective justice), and to develop effective ways of resolving conflicts of interest and making fair decisions (procedural justice)" (p. 232).

Within the scope of Information Society Rawls SoJ provides a framework to evaluate the safety and security tensions between corporations and government and the role of ACD. Seeking security requires there be a mechanism to promote a civil society through four types of justice. These are distributive, commutative, and corrective. A fourth justice, procedural addresses how

society seeks to apply remedies to some sort of injustice incurred. These are now discussed in detail.

Distributive justice means that someone is responsible for the distribution of goods from a common stock (Pakaluk, 2005, p. 196). In other words, corporations and governments enter into an agreement with their citizens and constituents about how resources are distributed, in terms of principles of equality, equity, reward, and merit. Implicit in this distribution agreement is some form of negotiation. For example, Rawls (1963) and Internet Security Alliance (2008) note a series of trade-offs between what is best for citizens but also what is necessary for government and corporations to fulfill their duties to citizens.

Commutative justice means there are agreements between people and rulers. The agreements are expressed as promises, commitments, and other kinds of social contracts. It is in this context in which crime is committed. For example, people expect the government to provide police services which protect them from criminals. However, how do people seek recourse for identity theft via internet or privacy breaches? Seeking recourse is further complicated when the identify information (name, date of birth, financial records) is held by private corporations often in jurisdictions outside the victim's country. As such, the social contract now extends to include corporations.

Corrective justice, on the other hand, means that there are means for correcting the inequality…created through an act of injustice, by taking goods away from the offender and restoring goods to the victim, or by simply punishing the offender" (Pakaluk, 2005 p. 196). It is within this domain in which deterrence, vengeance, forgiveness, revenge, restitutions, and retribution exist, in other words, the righting of wrongs (Pakaluk, 2005; Ritchie, 1891). The Information Society undermines this tenet because the victim, offender, and the "data" stolen are in different jurisdictions, and the offence may only be discovered through third parties. For this research paper; active cyber deterrence is the corrective measure being considered.

Corporate Decision Makers Demographics

Social contract theory adopts the stance that individuals can make rational choices based on lived experiences, and those choices tend to create a reality which promotes the emancipation of the individual, while seeking the best possible outcome for society.

From this notion then comes the question of what influences the individual decision maker who is tasked with the responsibility of protecting the information society? Researchers have identified a number of factors; amount of information available (Furner,2010; Kennerley & Mason, 2008; von Lubitz et al.,2008); blurring of war, terrorism, and crime (Buzan, Waever, and de Wilde, 1998; Castells, 2009; Webster, 2006). In otherwords; corporate decision makers are now exposed to a risk rich environment, too much information, and seemingly no clear lines of who is conducting an attack against their network.

Complicating this matter further, the demographics of corporate decision makers is a factor to consider. The decision maker's wealth, position of authority (MacCrimmon and Wehrung, 1990). In addition to demographics researchers noted; acute stress linked ambiguity of information did not impair decision making (Pabst, Schoofs, Pawlikowski, Brand, and Wolf, 2013), but, time (Das & Teng, 2001) did. Within the confines of this current research, these factors may have a cumulative effect as decision makers need to link cyber-attacks, victimization, and asset damage which occur in seconds, minutes, hours, days, weeks and months. Similarly, the time between the attack and when victim experiences the harm is measured in weeks or months (Allison, Schuck, & Lersch, 2005).

THE RESEARCH QUESTION(S)

This research proposal intends to contribute to a conceptual analysis and exploration of active defence as a viable information security practice by examining the decision makers who are responsible for protecting the information society. From this examination, we hope that this research can inform ACD policy development at the tactical and strategic level.

The research question which guides this exploration is:

"*What are the factors that influence corporate decision-making processes when deciding whether, or not, their organization should engage in active defence?"*

The following sub-questions will be used to focus this research:

1. *How does "offensive corporate cyber operation" differ from "active defense?*
2. *What is (are) the objective(s) of an active defense operation? i) deter, ii) disruption, iii) deference, and / or iv) destruction?*

These questions are a synthesis of nine years of research and investigations into online child pornography cases, fraudulent products being sold online and mass email phishing operations (e.g. Nigerian Prince Letter scam). More specifically, during these nine years, we have noted an emerging discourse amongst law enforcement, justice and public safety, and corporate decision makers. This discourse can be summed up into two thematic questions:

1. *Are we stopping the bleeding?*
2. *Are we slowing the bleeding? (i.e. is the current justice and public safety processes only working sometimes).*

These four sub-questions illustrate the complex balance cybersecurity professionals must attain when considering the goal of ACD operations, and more specifically, the role of deterrence, harm, and threat when securing the internet, securing the information stored on information technology systems, and also managing the situation when there is a cybersecurity incident (war, crime, terrorism) incident.

Traditional cybersecurity research tends to focus on the technological solutions of network security and/or reworking existing information security policies. Such policies generally rely upon conventional deterrence models which consider time/space and proximity of victim to offender. Our research project on cybersecurity adopts a different perspective: technological focused solutions need to be realigned to include a sociological scope. Therefore, this research will utilize the following bodies of knowledge; sense of justice, social contract theory, and related research on corporate decision-making. The next section will summarize the associated literature which is available to date.

RESEARCH METHODOLOGY

The methodology for this pilot study incorporated quantitative measures though a mixed research design may also provide necessary further explanation of the key findings found in this pilot study. For the pilot study, the sample is described first, followed by a discussion of the measures used, including the sampling frame, dependent and independent variables. After the initial data review of the data, we discuss the manipulation of the data set and how the

measurement model may explain the main study results. While multivariate analyses have gained prominence as a social science method, there are critiques of quantitative methodology. The primary critique appears to be quantitative methods impose specific views of causality, measure, and objectivity which do not adequately address the contextual nature of social sciences research (Denzin, 2010; Hesse-Biber, 2010; Maxwell, 2010). One means of addressing this contextual nature is to utilize a quantitative methodology which can explore the contextual nature of risk, harm, threats, and the information society in which offensive cyber operations. Several path analysis models have been generated based on the literature and TAM models above.

Quantitative Methodology – Survey Instrument

Five different survey instruments have been reviewed which allude to or specifically address cybersecurity practices relevant to this pilot research design. These surveys are:

1. Cyber Security Index, January 2014 developed by Geer and Pareek (2013)(as referenced by Bejtlich, 2014) theme question to examining active defence attitudes,
2. nCircle (as referenced in Lachow (2013) article) reference to revenge attacks
3. Public Safety Canada (2011) study of personal attitudes.
4. Ponemon Institute LLC (2012) study of identity breaches, and
5. RAND (2005) study of national security survey.

Our analysis of the five cybersecurity surveys reveal that three of the five surveys (Public Safety Canada, Ponemon Institute, and RAND Corporation) collected demographic data of the person or organization, types of harm (costs, identify theft) and types of attacks. The remaining two specifically asked about some form of offensive cyber operation (Cyber Security Index, nCircle); these two surveys appear to have collected limited demographic information. Furthermore, the audience of all five surveys was corporations and government organizations predominately from the Europe and North America. While the five surveys have made valuable contributions to society's understanding of cybercrime, the different attributes of the surveys do not lend themselves to comparative analysis. Our research will create the opportunity to systematically examine decision makers within corporations who are responsible for protecting the information assets of the information society within a global context.

Sampling Frame (Survey Participants)

The literature revealed many stakeholders who are influenced by the information society. This research will only examine the corporate decision makers who are responsible for protecting the information assets of the organization. According to Armistead (2004) and Singer and Friedman (2014) those responsible for protecting the information assets can be grouped into three broad classifications:

1. Those responsible for deploying the software utilized in active defence.
2. Those responsible for the legal liability and risks of the organization, and
3. Those responsible for the policies and procedures associated with physical security, human resources, and technology / network security.

These specific groups are linked to the risk assessment process and operations (Armistead, 2004, p. 68) or to specific organizational mandates associated with protecting information assets (University of Washington, 2014). Those responsible include Chief

Technology Officer, Chief Information Security office, Chief Information Officer, Legal Counsel for Organization, Chief Financial Officer. And all their associated reporting personnel.

Selecting Industry Sample

Those who have information assets which warrant protection will be identified using the following industry classification schemes. The industry sample will be drawn from the North American Industry Classification System (NAICS)(Statistics Canada, 2012) and the International Standard Industrial Classification of All Economic Activities, Rev. 4 (United Nations, 2008). Industry associations which represent the various industries will be approached to identify random participants.

DATA COLLECTION AND ANALYSIS OF SURVEY DATA

This pilot research utilized a survey instrument which was distributed using online survey software site Fluid Surveys after ethics committee approval. Statistical analysis was conducted using SPSS version 23. The survey used for this study consisted of six factor categories;

1. Protecting Information Society (independent variables)
2. Demographics (independent variables)
3. Social Contract Theory (dependent) & Sense of Justice (dependent)
4. Organizational Information Technology and Information Asset (dependent)
5. Decision Making (dependent)

The survey consists of Likert scale questions with nominal, ordinal, and interval levels of measurements. The analysis consisted of a multivariate design which combined variables to form a composite variable (Meyers et al., 2006). The combining of the variables is possible using factors analysis, multiple regression analysis, and model fitting. As such, multivariate design enables this research to examine multiple variables which are components of harm, threats, or deterrence and then identify specific subsets of each component which are the dominate drivers of that specific component.

The survey was administered to a sample of approximately 500 individuals age 18 and older, with a job title responsible for active defence tactics and corporate strategic practice. The distribution of survey participants is a homogeneous representation of cybersecurity environment.

Data Analysis

All the measurement variables involving corporate decision making and government intervention were included in a factor analytic model so as to measure loading. Table 2 below shows both the raw and scaled communalities (PCA model). Corporate and governmental level of responsibilities for protection of the information study load at .8 and greater. Responsibility of the corporations to lobby the governments for activation of cyber defence strategies is strongly supported at an extraction factor of .874.

Table 2
PCA MODEL 1 COMMUNALITIES

Survey Questions	Raw		Rescaled	
	Initial	Extraction	Initial	Extraction
Corporations can protect the information society.	1.007	.478	1.000	.474
Governments and Corporations can help each other protect the information society.	.452	.166	1.000	.366
Governments and Corporations share the same responsibility to protect the information society.	1.668	1.390	1.000	.833
Corporations should lobby the government to actively engage cyberattackers who threaten the information society.	1.176	1.029	1.000	.874
Corporations are socially responsible members who can protect the information society.	1.572	1.340	1.000	.853
Corporations have a social obligation to inform the public about how they will be engaging cyberattackers.	1.072	.646	1.000	.603
Corporations should be empowered with more legal powers to engage cyberattackers.	1.225	.618	1.000	.505

Table 3 shows that three key components constituted from both corporate and governmental level of responsibility for counter defensive strategies that account 69% of the variance, which connotes that the this shared level of responsibility will be the key prerequisite condition to work against the cyber criminals both from the statutory and corporate perspective.

Table 3
MODEL VARIANCE TOTAL VARIANCE EXPLAINED

		Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Raw	1	3.220	39.402	39.402	3.220	39.402	39.402
	2	1.249	15.280	54.682	1.249	15.280	54.682
	3	1.199	14.672	69.354	1.199	14.672	69.354
	4	.912	11.157	80.511			
	5	.808	9.892	90.403			
	6	.623	7.626	98.029			
	7	.161	1.971	100.000			
Rescaled	1	3.220	39.402	39.402	2.464	35.203	35.203
	2	1.249	15.280	54.682	1.056	15.084	50.287
	3	1.199	14.672	69.354	.989	14.134	64.421
	4	.912	11.157	80.511			
	5	.808	9.892	90.403			
	6	.623	7.626	98.029			
	7	.161	1.971	100.000			

The scree plot, Figure 1, demonstrates that the three key components of active defence strategies are impacted by corporate responsibility and governmental intervention on the policy side. These include:

1. Governments and Corporations share the same responsibility to protect the information society.
2. Corporations should lobby the government to actively engage cyber attackers who threaten the information society.
3. Corporations are socially responsible members who can protect the information society.

Figure 1
KEY COMPONENTS OF ACTIVE DEFENCE

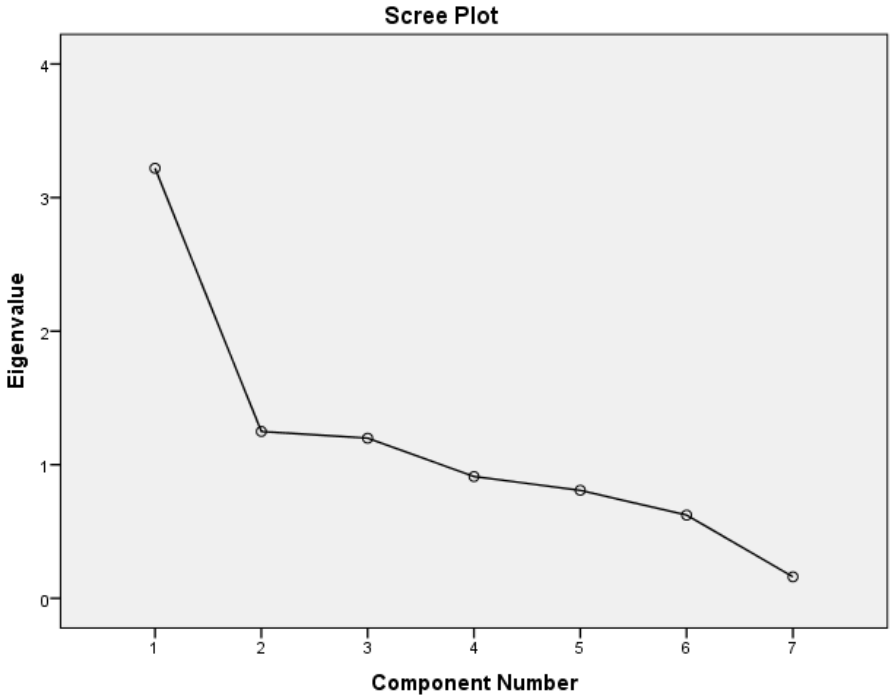


Table 4 further demonstrates the level of significance of the need for governmental leadership in its fiduciary role to ensure the legislative framework will be in place to safeguard the information society and provide the prerequisite platform for the corporation to actively engage in ACD. On both the categories, respondents strongly agree with government intervention in the process.

Table 4
DESCRIPTIVE STATISTICS ON GOVERNMENT INTERVENTION POLICY RESPONSIBILITY

Variables	Liekert Scale	Mean	Std. Deviation	N
Governments can protect the information society.	Strongly Agree	2.25	1.500	4
	Agree	3.46	1.050	13
	Neutral	3.38	1.408	8
	Disagree	2.80	1.304	5
	Total	**3.17**	**1.262**	**30**
Governments and Corporations share the same responsibility to protect the information society.	Strongly Agree	1.25	.500	4
	Agree	2.85	1.405	13
	Neutral	1.87	.991	8
	Disagree	2.60	1.342	5
	Total	**2.33**	**1.295**	**30**

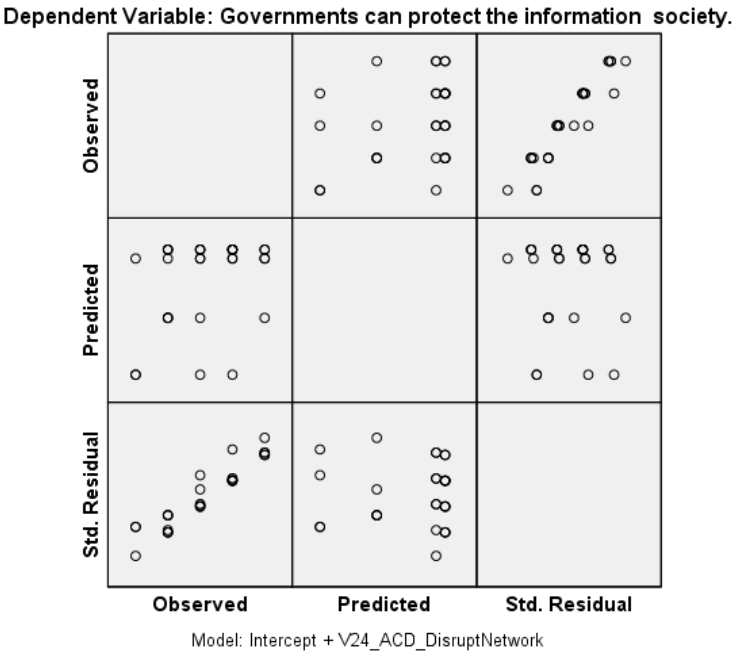
Table 5 shows the results of test of homogeneity of variance violations. These are tests for homogeneity of variance violations for the dependent variables. The evaluation shown for Government and Corporations variable is statistically significant at p <.05. The overall government protection of information society is not statistically significant.

Table 5
LEVENE'S TEST OF EQUALITY OF ERROR VARIANCES[a]

	F	df1	df2	Sig.
Governments can protect the information society.	.499	3	26	.686
Governments and Corporations share the same responsibility to protect the information society.	3.471	3	26	.030
Tests the null hypothesis that the error variance of the dependent variable is equal across groups.				
a. Design: Intercept + V24_ACD_DisruptNetwork				

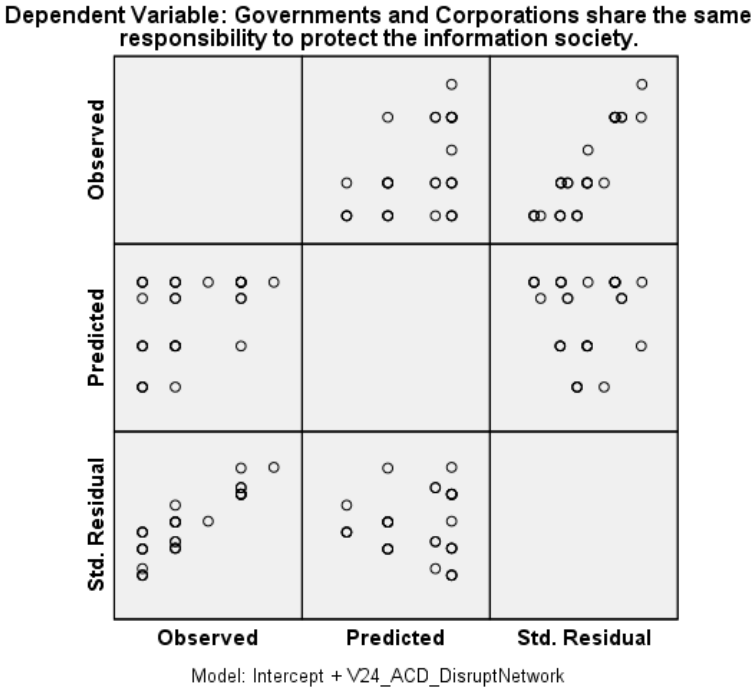
Figure 2 plots observed vs. predicted values by standard residuals shows the predicted and observed residuals for the dependent variable of Government Protection of Information Society further emphasized the government's role to protect the societal information asset, which is also inclusive of corporate information assets.

Figure 2
OBSERVED * PREDICTED * STD. RESIDUAL PLOTS



Similarly, Figure 3, the shared responsibility between governments and corporation show similar standard residual errors between observed vs. predicted residuals, attesting to the need that cyber defence and counter offensive strategies display similar error patterns.

Figure 3
OBSERVED * PREDICTED * STD. RESIDUAL PLOTS



Tables 5 and 6 show an ANOVA model, the model variables are:

Dependent Variable: Corporations should lobby the government to actively engage cyber attackers who threaten the information society.
Predictors: (Constant), Deterrence does not work in cyberspace.

Table 5
MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.406[a]	.165	.134	.933

a. Predictors: (Constant), Deterrence does not work in cyberspace.

The overall model fit at p<.05 shows model significance.

Table 6
ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.629	1	4.629	5.316	**.029[b]**
	Residual	23.509	27	.871		
	Total	28.138	28			

a. Dependent Variable: Corporations should lobby the government to actively engage cyber attackers who threaten the information society.

b. Predictors: (Constant), Deterrence does not work in cyberspace.

Further, Table 7 shows a high level of significance for the cyber deterrence factor at p<.05, indicating cyber deterrence may be a significant factor in employing corporate cyber strategies, thus the need to initiate formal cyber defence strategies that can quickly be implemented without delay, before corporations suffer damage to information asset.

Table 7
COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.944	.560		1.684	.104
	Deterrence does not work in cyberspace.	.414	.180	.406	2.306	.029

a. Dependent Variable: Corporations should lobby the government to actively engage cyber attackers who threaten the information society.

CONCLUSION

Information is the most valuable commodity in the world ((Bruce, Hick, & Cooper, 2004, p. 11). In any business, in any industry, in any part of the world, the right information is absolutely priceless. (Bruce, Hick, & Cooper, 2004, p. 11). S Webster (2006) proposed that the "information society" is subject to abuse, threats, and could be used to cause harm to the individuals who surrendered their personal information to the corporation since the expansion on online e-commerce business platforms, the number of users have been increasing exponentially. This level of information explosion has necessitated that corporations need to access this new platform and use it as an efficient commerce platform. This increased level of activity has created many opportunities for cyber criminals to target corporate data bases, and where applicable, impact financial damage to corporations, as we have recently seen with Target Corporation, in the USA. Similar cyber-attacks on the Canada Revenue Agency, Bank of Canada. If such attacks are not stopped with counter offensive corporate strategies, monumental damage both monetary and other ways is inevitable. Therefore, cyber-criminal behavior needs to be stopped, counter defended so as to protect the societal and corporate information asset.

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APPENDIX A - SURVEY INSTRUMENT

Dear Information Security and Information Technology Professional, Living in the information age presents a number of challenges to citizens, governments, and companies. The focus of my Doctor of Social Sciences research is to examine one specific question: What are corporate information technology professionals' thoughts on using active defence as a very specific technique to deter cyberattackers? As an information technology professional your participation in this survey will contribute to this debate, and is greatly appreciated.If you wish to establish my credentials, I invite you to contact Dr. Bernard Schissel head of the Doctor of Social Sciences program at Royal Roads University. Dr. Schissel can be contacted at +1 800 788 8028 or via email at Bernard.schissel@royalroads.ca. This survey is voluntary and requires approximately 20 minutes of your time. You are under no obligation to participate and if you choose to participate, you may refuse to answer questions that you do not want to answer. Participants should print a copy of the consent form to keep for your personal records. If you choose to exit the survey at any time during the survey using the Discard button your data will be withdrawn. Please remember, once you submit your survey responses, you will not be able to withdraw from the study given the anonymous nature of your responses. By clicking start you have agreed to participate and provided free and informed consent. Similarly, if you do not submit the survey, then you have withdrawn your consent. Your decision to complete this survey will be interpreted as an indication of your consent to participate. In advance, thank you for participating in this research. Your contribution to this research is appreciated. Should you have any comments or questions about this survey, please email me at Patrick_neal@bcit.ca. If I have missed something that you believe will contribute to this research please add your comments at the end of the survey. Sincerely, Patrick Neal Doctor of Social Sciences Candidate Royal Roads University.

1. How much do you agree or disagree with each statement?
2. Governments can protect the information society.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
    - n/a
3. Corporations can protect the information society.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
    - n/a
4. Citizens do not trust corporations to protect the information society.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
    - n/a
5. Citizens do not trust governments to protect the information society.
    - Strongly Agree
    - Agree

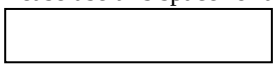
- Neutral
- Disagree
- Strongly Disagree
- n/a

6. Governments and Corporations can help each other protect the information society.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree
   - n/a
7. Governments and Corporations share the same responsibility to protect the information society.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree
   - n/a
8. Please use this space for additional comments.

9. How much do you agree or disagree with each statement?
10. Society needs accurate information to ensure we can meet our basic survival needs (securing food, water, shelter, clothing).
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
    - n/a
11. Information is the life blood of modern society.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
    - n/a
12. Information is a commodity similar to oil and gold.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
    - n/a
13. Corporations should lobby the government to actively engage cyberattackers who threaten the information society.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
    - n/a
14. Corporations should be empowered with more legal powers to engage cyberattackers.
    - Strongly Agree
    - Agree
    - Neutral

- Disagree
- Strongly Disagree
- n/a

15. Corporations are socially responsible members who can protect the information society.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
    - n/a
16. Corporations have a social obligation to inform the public about how they will be engaging cyberattackers.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
    - n/a
17. Please use this space for additional comments.



18. How much do you agree or disagree with each statement?
19. Cyberattackers can be deterred.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
    - n/a
20. Deterrence does not work in cyberspace.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
    - n/a
21. Cyberattackers fear jail time.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
    - n/a
22. Cyberattackers fear being captured.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
    - n/a
23. Attacking a cyberattackers computer network will deter further cyberattacks.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
    - n/a

24. Attacking a cyberattackers social network will facilitate deterrence.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
    - n/a
25. Please use this space for additional comments.

26. How much do you agree or disagree with each statement?
27. Active defence will deter cyberattackers.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
    - n/a
28. Active defence is a systematic disruption of cyberattacker's computer network.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
    - n/a
29. Active defence is a systematic deterrence of a cyberattacker's computer network.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
    - n/a
30. Active defence is a revenge attack on a cyberattacker's computer network.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
    - n/a
31. Active defence can be legislated.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
    - n/a
32. Active defence can be insured.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
    - n/a
33. I would conduct an active defence operation if the corporation has liability insurance.
    - Strongly Agree
    - Agree

- Neutral
- Disagree
- Strongly Disagree
- n/a

34. I would conduct an active defence operation if the corporation has the legal jurisdiction to conduct active defence operation.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
    - n/a
35. Please use this space for additional comments.
36. What is your age?
    Enter N/A if you prefer not to answer.
37. What is your sex?
    - Male
    - Female
    - Prefer not to answer
38. What is your current relationship status?
    - Married
    - Divorced
    - Common Law
    - Single
    - Prefer not to answer
39. How many children do you have?
    Enter N/A if you prefer not to answer.
40. What is your highest level of education obtained?
    - High School
    - College
    - University - Bachelor
    - University - Master
    - University - Doctoral
    - Prefer not to answer
41. What is your primary industry / service sector?
    Pick your three primary sectors.
    - Accommodation and food services
    - Administrative and support
    - Agriculture, forestry, fishing and hunting
    - Arts, entertainment and recreation
    - Construction
    - Educational services
    - Finance and insurance
    - Health care and social assistance
    - Information and cultural industries
    - Management of companies and enterprises
    - Manufacturing
    - Mining, quarrying, and oil and gas extraction
    - Other services (except public administration)
    - Professional, scientific and technical services
    - Public administration

- Real estate and rental and leasing
- Retail trade
- Transportation and warehousing
- Utilities
- Waste management services
- Wholesale trade
- Prefer not to answer

42. How many years do you have in IT security?
    Enter N/A if you prefer not to answer
43. What is your current position on the IT Security Team?
    Enter N/A if you prefer not to answer
44. Does your organization have a dedicated IT Security Response Team?
    - Yes
    - No
    - Prefer not to answer
45. How many cyberattacks have you witnessed in the past 5 years?
    Enter N/A if you prefer not to answer
46. How many cyberattackes have you investigated in the past 5 years?
    Enter N/A if you prefer not to answer
47. How many AD operations have you been involved in the past 5 years?
    Enter N/A if you prefer not to answer
48. How many AD operations have you witnessed in the past 5 years?
    Enter N/A if you prefer not to answer
49. Select the Top 3 Computer Security concerns you have.
    - Computer Virus
    - Denial of Service
    - Electronic Vandalism
    - Embezzlement
    - Fraud
    - Theft of intellectual property
    - Unlicensed use or copying digital products
    - Theft of personal information
    - Theft of financial information
    - Other computer security (hacking, spoofing, phishing, sniffing, pinging, scanning, spyware, etc)
    - Breaches linked to stolen laptops, cellphones, and smartphones.
    - Prefer not to answer
50. Please use this space for additional comments
51. Thank you for completing this survey and submitting your answers.
52. Please use this space for additional comments.

HOW EMPLOYEES' PERCEPTIONS OF COMPETENCY MODELS AFFECT JOB SATISFACTION? MEDIATING EFFECT OF SOCIAL EXCHANGE

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Uğur Yozgat, Marmara University
Taha Yusuf Çakarel, Marmara University

ABSTRACT

With growing emphasis being placed on human resource competencies as a means to be the indicator of employee potential to produce performance outcomes i.e. employee creativity and in turn organizational innovation, this study seeks to determine if competencies are predictive of employee behavior; determine if there is a relationship between competencies and job satisfaction of employees' perceptions; and determine the mediating effect of social exchange in this relationship. Analyses of 207 employees working in banking, telecommunications, health care, aeronautical and food industries in Turkey show that perceptions of competency model relevance and fairness has a positive effect on intrinsic and extrinsic job satisfaction. Also results show that social exchange partially mediated the relationship between perceptions of competency model relevance and fairness and intrinsic and extrinsic job.

INTRODUCTION

In today's competitive marketplace, firms in every industry are seeking new ways for gaining and sustaining competitive advantage. Human resource competencies are viewed as the critical resource behind a firm's core competencies, and, thus, competitive advantage (Redmond, 2011; Lawler, 1994; Nordhaug & Gronhaug, 1994; Wright, McMahan & McWilliams, 1994). In this context, firms' human resources management should focus on competencies for gaining and sustaining competitive advantage. In human resource management literature, competency is defined as "a set of observable performance dimensions, including individual knowledge, skills, attitudes, and behaviors, as well as collective team, process, and organizational capabilities that are linked to high performance, and provide the organization with sustainable competitive advantage" (Athey and Orth, 1999:216). Competency approach in human resources management is used as a tool for performance evaluation, career development, remuneration and dismissal decisions because competencies is considered to represent an area affecting behavior of individual performance and therefore business success. Hence competency models has gained a great deal of interest and seen as a method of directly focusing on the management system contributing to organizational success and sustainability (Dubois & Rothwell, 2004; Levine, 1997). If employees' competencies, skills, ideas and labor are used effectively in business operations, output and efficiency in terms of business and job satisfaction in terms of employees will be positively affected. It is important both for employees and businesses that employees comprehending the necessity of competency-based approach and employees perceptions about the fair applications of competency models for each employee. Employee's job satisfaction and organizational commitment will be positively affected if employee perceives his/her competencies assessed fairly, in this case both employee's and business performance will

increase (Campion et. al., 2011). The relationship between employees and their organizations are basically conceptualized as a social and economic exchange. Social exchange relationship is emerged when the relationship between employee and organization rely on trust and a high degree of mutual obligation (Shore et. al., 2006). Research show that competency models have positive effects on employee performance and outputs providing transparency about objectives and performance measures set for employees and improving the consistency of human resources applications (Redmond, 2013; Ramlall, 2006). In contrast, there are studies examine the situations of competency models viewed as a source of tension for employees. In these studies, employees' lack of trust in management's strategies and the situations that employees fail to understand their individual fit within a competency framework are discussed. Thereby, the main object of this paper is to examine how employees perceive competency model relevance and fairness and this perception's effect on job satisfaction. In this context, mediating role of social exchange is investigated. For purposes of this study, first, prior theories and research focusing on competency models, job satisfaction and social exchange are reviewed. Second, research hypotheses are developed and research model is presented. Third, discussion of the methods and findings are explained in the light of the research conducted. Finally, discussion about the research results is stated expressly.

LITERATURE REVIEW

Competency and Competency Models

The concept of competency was developed in the 1960s incorporates elements such as leadership and superior performance. The concept of competency including behavior, knowledge and attitudes that enables creation of high performance level consistently and effectively is important for the sustainability of business (Cira & Benjamin, 1998). Today competencies are a significant source of data relating to employees' qualifications at the individual level and in the business. This data is an important criterion in training and development, performance evaluation, career development, remuneration and hiring decisions by human resources management. To this end, many businesses tend to associate the concept of competency with business mission, vision, and objectives. The purpose of determination of competencies depends on the vision that the company wants to achieve, the mission that the company should accomplish and the formulation and implementation of strategies needed for achieving this mission. Competency in terms of human resources is summarized as the knowledge, skills and abilities that distinguish high performance from average performance, as the structures that help to define the knowledge and the skill level, as the observable behavioral characteristics that is important to realize the fundamental responsibility of a role or a job (Schippmann, et. al., 2000; Zemke & Zemke, 1999; Parry, 1998). Competencies owned by a business are a collection of characteristics and skills of the existing workforce. The success of the various functional departments of the company depends on the qualifications, knowledge, skills and competencies of the employees in those departments. The differences in the skills and competencies of employees lead to companies' competencies to be different (Alldredge & Nilan, 2000). Due to the individual-based content of competency concept, individual analysis and the results of this analysis subjected to human resource management in the management of competency provide an opportunity for the creation of action at the organizational level (Lahti, 1999). The potential of employees is associated with their competencies. Identification of individual competencies, also the revelation of the individual's potential, ensure the recognition of the strengths and

insufficient abilities. Identification of competencies, directs individual behavior and the organization in order to get the results wanted. Well-defined competencies that can be measured, allows the assessment of the behavior and attitudes able to achieve superior performance. With this feedback, deficient competencies can be developed. Competencies also make business can be distinguished. Businesses will acquire a different identity from other businesses by their specific competency criteria that they determined. To achieve this, businesses should determine distinctive competencies and should pay attention to alignment of these competencies with the business strategy, goals and the culture. Competencies are integrated with management practices and these competencies can be integrated with functions such as recruitment and performance evaluation, etc. (Smallwood, et. al., 2000). Competency models are developed derived from its strategic importance in terms of employees and businesses. What is meant by competency model is that "a decision tool used in determining and developing the competencies required to perform employees' jobs and responsibilities undertaken in line with the strategic objectives of the business completely and accurately as expected from employees" (Chen & Naquin, 2006). In this context, the competency model has been described as a systematic process aimed at eliciting both as an individual and organizational level of competence in detail (Mirabile, 1997). Based on the concept of competency, Schippmann et al made efforts to develop competency models. In the literature, research focused on the processes that contribute to the development of competency model and competency model contributing to each of these processes are discussed. Competency models basically serve as employees' complete and accurate understanding of what is expected from them in line with the objectives of the company. Therefore, it is possible to address the competency model as a descriptive tool providing a consistent framework for all employees (Hill, 2012; Vazirani, 2010; Green, 1999). Competency models has added a strategic dimension to the traditional concept of business analysis, has an important place in human resources practices and particularly played an important role in recruitment, training and development and talent management becoming compliant practices. Identification of competencies and their levels are considered as the first step in the process of creating a competency model. First, competencies should be converted into observable behavior and should be identified and should be measured (Derven, 2008). Only in this way it will be able to benefit from the competencies and competency models. The primary purpose of competency models is to influence strategically aligned behavior by outlining the behavioral themes that are expected and rewarded across all jobs in the organization (Sanchez & Levine, 2009). How the competency models are perceived by the employees in the organization plays an important role on employee outcomes (Serim, et. al, 2014) Employee perceptions of competency models is defined as the degree to which employees perceive the organization's competency model to be both strategically and personally relevant and that they are fairly rewarded for displaying the behavior outlined in the competency model (Redmond, 2013, 2011). Herein, employees' perceptions on competency models are based on relevance and fairness: "Relevance" indicates whether employees perceive competency models as important to reaching both organizational and individual goals; "Fairness" refers to employee perceptions of whether competency models are impartial (Redmond, 2013, 2011). Fairness is often assessed along the dimension of distributive justice, referring to the perceived fairness of rewards (Bowen, et. al., 1988). It is important for business that management's support to the competency models and their practices and employees' both strategic as well as personal perceptions on competency models as relevant and fair.

Social Exchange

Most of the studies about the exchange relationship between businesses and their employees are based on "Social Exchange Theory" (Masterson, et. al., 2000). "Social Exchange Theory", under certain conditions, expresses individuals tend to respond in a positive way against the person or persons who benefit them. Positive relational interaction between supervisors and employees are provided through social exchange and in this case the employees are spending more time and energy to their job, and it makes them to be more creative and more responsible. And as a result, it makes a positive effect from various perspectives for the whole organization (Wayne, et. al., 1997; Graham, 1991). Social exchange relationship will be affected positively if employees perceive a fair structure in the organizations they work in. Because social exchange approach is emerged in case of relationship between employees and their organization based on trust and a high degree of mutual obligation. Relations based on social exchange approach can create beneficial effects on behalf of organizations White & Yanamandrama, 2012). Studies about psychological contract, perceived organizational support, and employment relationships reveal that employees respond with more positive attitudes towards positive organizational behavior and show higher performance (Shore, 2009).

Job Satisfaction

Since Herzberg, Mausner, and Snyderman (1959) published their book 'The Motivation to Work', many studies about classifying job factors into intrinsic and extrinsic categories have been done. Intrinsic factors are defined as those directly related to the actual performance of the job (i.e., achievement, responsibility, nature of work, etc.), while extrinsic factors are defined as those related to the environment in which the job is being performed (i.e., company policy, working conditions, interpersonal relationships, security, etc.) (Saleh & Grygier, 1969). From this point of view, job satisfaction refers to the employee's overall affective evaluation of the intrinsic and extrinsic facets of the job (Bettencourt, et. al., 2001). Job satisfaction is the extent to which people like their jobs (Hirschfeld, 2000). In other words, job satisfaction can be described as an affective or emotional reaction to the job, resulting from the incumbent's comparison of actual outcomes with the required outcomes (Cranny, Smith & Stone, 1992; Locke, 1976). From the literature review, it is seen that job satisfaction is a widely researched topic and many studies relate to the significant associations of job satisfaction with several variables. Namely, it has a positive association with many job outcomes such as employees' job performance, organizational commitment, organizational citizenship behavior, etc.

RESEARCH METHODOLOGY

Research Goal

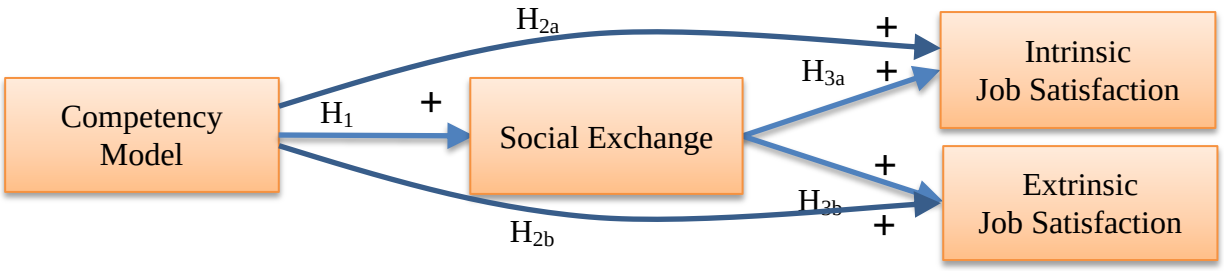
Our research goal is to investigate the mediating effect of social exchange on the relationship between competency model and (intrinsic and extrinsic) job satisfaction. To test the propositions, a field survey using questionnaires was carried out.

Proposed Model

In the current study, we investigated the role of competency model to advance our understanding of how competency model influence job satisfaction and the mediating effect of

social exchange support on competency model – intrinsic and extrinsic job satisfaction relationship. The hypothesized model is shown in Figure 1.

Figure 1
RESEARCH MODEL



H1: Perceptions of competency model relevance and fairness has a positive effect on social exchange.
H2: Perceptions of competency model relevance and fairness has a positive effect on job satisfaction.
H2a: Perceptions of competency model relevance and fairness has a positive effect on intrinsic job satisfaction.
H2b: Perceptions of competency model relevance and fairness has a positive effect on extrinsic job satisfaction.
H3: Social exchange has a positive effect on job satisfaction.
H3a: Social exchange has a positive effect on intrinsic job satisfaction.
H3b: Social exchange has a positive effect on extrinsic job satisfaction.
H4: Social exchange has a mediating role between perceptions of competency model relevance and fairness and (a) intrinsic job satisfaction (b) extrinsic job satisfaction.

Sample

This study was conducted in Istanbul by using convenient sampling method on participants working in banking, telecommunications, health care, aeronautical and food industries implementing competency model. A total of 300 questionnaires were provided for distribution, of which 239 (79.7 %) were returned. After deleting the semi-filled ones 207 (69.0 %) questionnaires were analyzed using SPSS statistical program and tested through hierarchical regression analyses.

Measures

Competency model was measured by the scale developed by Bowen and Ostroff (2006). Participants were asked to rate each of the six items using a 5-point Likert scale so that they can select a numerical score ranging from 1 to 5 for each statement to indicate the degree of agreement or otherwise, where 1, 2, 3, 4, and 5 denote "Strongly Disagree", "Disagree", "Neither Agree nor Disagree (Neutral)", "Agree", and "Strongly Agree", respectively.

Social exchange was measured eight item scale, as an adopted from English scale used by Shore et al. (2006). Participants are asked to rate each of the items using a 5-point Likert scale (1=strongly disagree, 5= strongly agree). The validity of the in Turkish translated scale has been substantiated by Göktepe (2012).

For measuring ***job satisfaction*** Weiss et al.'s (1967) scale known as the Minnesota Satisfaction Questionnaire's short form capturing 12 intrinsic job satisfaction items and 8

extrinsic job satisfaction items were used. In this study, Minnesota Satisfaction Questionnaire translated into Turkish by Oran (1989) was used. All the variables were measured by participant responses to questions on a five-point Likert-type scale ranging from "very dissatisfied" to "very satisfied" for the variable job satisfaction.

Findings

The demographic characteristics of participants were subjected to frequency analysis. Of the 207 participants, 111 (53.6 %) were female. The mean age of participants was 31.10 (σ=7.16). Education varied at six levels, ranging from elementary level education (1) to doctoral level education (6) ($\bar{x}$=3.91, σ=1.04). Sector information of participants: 56 (27.1%) banking, 38 (18.4%) telecommunications, 40 (19.3%) were health care, 37 (17.9%) aeronautical and 36 (17.3%) food sector. The average of job tenure was 5.60 (σ=5.91).

To control for common method bias in line with the original -factor test was conducted, although the explanatory power of it is controversial and no single factor emerged in exploratory factor analysis (EFA) (Podsakoff et al, 2003). In line with Knight (1997), in international studies it is important "to evaluate the dimensionality of the scale" and to control for factor structure and loadings. Two separate EFAs using Varimax Rotation were conducted for the dependent variables (intrinsic and extrinsic job satisfaction), the independent variables (competency model and social exchange) following generally accepted procedures. For exploratory research, a Cronbach α greater than 0.70 is generally considerate reliable (Nunnally, 1978). The results of Cronbach's alpha, % of variance explained and factors analysis of our study are depicted in Table 1.

Table 1
FACTOR ANALYSIS

	Factor Score	% of Variance	Total	α
Intrinsic Job Satisfaction		**25.239**	**8.581**	**0.921**
IJS15	0.794			
IJS08	0.779			
IJS10	0.775			
IJS07	0.754			
IJS02	0.730			
IJS09	0.706			
IJS01	0.691			
IJS20	0.691			
IJS16	0.681			
IJS11	0.666			
IJS04	0.650			
IJS03	0.611			
Social Exchange		**15.385**	**5.231**	**0.915**
SE3	0.830			
SE5	0.819			
SE6	0.781			
SE2	0.778			
SE1	0.738			
SE8	0.707			
SE7	0.698			
SE4	0.697			

	Factor Score	% of Variance	Total	α
Competency Model		**13.928**	**4,736**	**0.933**
CM4	0.849			
CM2	0.841			
CM1	0.817			
CM5	0.801			
CM3	0.758			
CM6	0.723			
Extrinsic Job Satisfaction		**13.488**	**4,586**	**0.928**
EJS12	0.790			
EJS05	0.772			
EJS13	0.767			
EJS06	0.752			
EJS14	0.684			
EJS19	0.682			
EJS18	0.644			
EJS17	0.600			

Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)=0.915
$X^2_{\text{Bartlett test}}$ (561)=5360.020 p=0,000
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Table 2 reports the means, standard deviations and correlations. According to Table 2 most of the respondents expressed the presence of a relatively higher level of intrinsic job satisfaction ($\bar{x}$=4.07). This was followed by extrinsic job satisfaction ($\bar{x}$=3.98) and competency model ($\bar{x}$=3.81). The lowest item is social exchange ($\bar{x}$=3.48). After analyzing the table, we can see that the relations between competency model, social exchange, intrinsic and extrinsic job satisfaction have positive correlations in the level of p<0.01.

Table 2
MEANS, STANDARD DEVIATIONS, ALPHA COEFFICIENTS, AND CORRELATIONS AMONG STUDY VARIABLES

Variables	Mean	S.D	1	2	3	4
1 Competency Model (CM)	3.81	0.830	1			
2 Social Exchange (SE)	3.48	0.868	0.436**	1		
3 Intrinsic Job Satisfaction (IJS)	4.07	0.928	0.473**	0.372**	1	
4 Extrinsic Job Satisfaction (EJS)	3.98	1.179	0.535**	0.419**	0.671**	1

** p <0.01 (two-tailed tests); N=207

As seen in Table 3, the findings from regression analyses conducted to test the first three hypotheses.

Table 3
SUMMARY OF REGRESSION ANALYSIS

Ind. Var.	Dep. Var.	Std. β	t	Adj. R^2	F	P	Hyp.	Result
CM	SE	.436**	6.94	.186	48.14	.000	H_1	Supported
CM	IJS	.473**	7.69	.220	59.15	.000	H_{2a}	Supported
CM	EJS	.535**	9.07	.283	82.19	.000	H_{2b}	Supported
SE	IJS	.372**	5.73	.134	32.91	.000	H_{3a}	Supported
SE	EJS	.419**	6.61	.172	43.73	.000	H_{3b}	Supported

** p<0.01

A three-step regression analysis suggested by Baron and Kenny (1986) was used to test the mediating effect SE between CM and IJS/EJS relationships. According to this method, to be able mention an intermediary effect, the following conditions are expected to be seen:

(1) Independent variable (CM) must have an effect on dependent variables (IJS/EJS),

(2) Independent variable (CM) must have an effect on intermediary variable (SE),

(3) Intermediary variable (SE) must have an effect on dependent variables (IJS/EJS),

(4) When intermediary variable (SE) is involved in a regression analysis with independent variable (CM), intermediary variable (SE) must have an effect on dependent variable (IJS/EJS) as the regression coefficient of independent variable (CM) upon dependent variable (IJS/EJS) drops.

The independent variable coefficient of decline was part of the mediation, this relationship completely, the disappearance of an expression with a statistically significant avoid the situation is exactly the mediating relationship is expressed.

Table 4
SUMMARY OF HIERARCHICAL REGRESSION ANALYSIS

Ind. Var.	Dep. Var.	Std. B	T	Adj. R^2	F	p	Hyp.	Result
CM	IJS	.384**	5.73	.251	35.42	.000	H_{4a}	Supported
SE		.204**	3.05					
CM	EJS	.435**	6.82	.322	49.92	.000	H_{4b}	Supported
SE		.230**	3.60					

** $p<0.01$

The mediating effect of regarding the Baron and Kenny (1986) by the requirements set out in the first three H_1, H_{2a} / H_{2b} and H_{3a} / H_{3b} hypothesis with the adoption has occurred in the last row of the regression model SE be included along with the CM regression coefficient of the decline shown by the SE and, together with the in the model, the effect of significant observed. This conclusion is based on the mediation for the effect of the sought-after in the last circumstance is also occurred; the partially mediating effect of SE was seen between CM and IJS/ EJS. And H_{4a} / H_4b hypothesis has been accepted.

CONCLUSION

Human resources' competencies assessed as a factor that creates innovation and value to the organizations is becoming extremely important for organizations. An approach based on the development of competencies; improve the performance of employees in the individual sense; so it will also help to improve the performance of organizations.

In this study, the mediating effect of social exchange on the relationship between competency model and (intrinsic and extrinsic) job satisfaction was investigated in Turkey. As the results of analyses, perceptions of competency model are positively related to intrinsic and extrinsic job satisfaction. Perceptions of competency model relevance and fairness are positively related to intrinsic and extrinsic job satisfaction. In other words, as the employees perceive the competency models applied in organization as fair and relevant, more satisfied employees exist in competency based organizations. These findings are consistent with previous findings about competency models based on relevance and fairness lead to positive job outcomes. On the other hand, results show that social exchange partially mediated between perceptions of competency model relevance and fairness and intrinsic and extrinsic job satisfaction. And these findings

support existing findings in the literature that when employees perceive competency models fair and relevant, social exchange reveals and they have intrinsic and extrinsic job satisfaction. As a result, our findings suggest that competency models perceived as strategically and personally relevant and fair enhance perceptions of social exchange relationships, which, in turn, increase employees' job satisfaction. Accordingly, efforts to increase perceptions of relevance and fairness of the organization's competency model would likely be reciprocated with higher levels of such outcomes (Redmond, 2011). These positive outcomes will increase organizational performance and create competitive advantage for organizations resulting from implementation of competency models in human resource practices.

This study's theoretical contribution is examination of the mediating effect of social exchange on the relationship between competency model and (intrinsic and extrinsic) job satisfaction; proposing new variables in the model and filling this gap in the research. Furthermore, this study's practical contribution is there is lack of research that consists of all stated variables in our model conducted in different industries. And finally, the methodological contribution of this study is investigation of consequences of employee's perceptions of competency model relevance and fairness and job satisfaction in Turkey, a developing country; it shows the external validity of these theories which were tested in Western developed countries.

LIMITATION AND FUTURE RESEARCH

This study was limited and only focused on the effects of employees' perceptions of competency models on job satisfaction and the mediating role of social exchange in this effect of the banking, telecommunications, health care, aeronautical and food industries in Istanbul. This study was not conducted on a single industry. However each industry has its specific conditions which may affect. Therefore, future research may replicate this study in a single industry and should focus on other positive organizational behavior variables.

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IMPACT OF MOBILE PLATFORM STRATEGY ON PLATFORM GENERATIVITY AND COMPETITION

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ABSTRACT

Through convergence, smartphone has become more versatile than any other technological devices in the past. Both hardware device and operating system (OS) have advanced to perform various functions that were performed originally in separate devices. Considering each operating system engages different degrees of openness in its platform strategy, it seems necessary to identify how different mobile platform strategies affect the ecosystem and the affluence of the platform. In this paper, in order to measure the affluence of platform, generativity of platform is discussed as a factor that can influence how the platform ecosystem is governed by the platform owner. This paper addresses the following research question: How does mobile platform strategy affect generativity and competition on the platform? We will analyze the different types of competition on the platform that the platform owner has to face. The relationship between mobile platform strategy, generativity, and competition will be discussed in the following section in order to answer the research question

INTRODUCTION

Through convergence, smartphone has become more versatile than any other technological devices in the past. Both hardware device and operating system (OS) have advanced to perform various functions that were performed originally in separate devices. According to Kenney and Pon (2011), information and communications technology (ICT) firms are entering a new era that is unifying software, hardware, and services. At the center of such dramatic change, there is a mobile platform where services are provided for users. Cusumano (2010) claimed that technological competition is about who has the best platform strategy and the best ecosystem to support the strategy.

Considering each operating system engages different degrees of openness in its platform strategy, it seems necessary to identify how different mobile platform strategies affect the ecosystem and the affluence of the platform. In this paper, in order to measure the effect of platform, generativity of platform is discussed as a factor that can influence how the platform ecosystem is governed by the platform owner. From the platform owner's perspective, it is also essential to attain certain purposed value, either monetary or social; from the platform it is operating (Elaluf-Calderwood, Eaton, Sørensen, & Yoo, 2011). This paper brings a new perspective on mobile platform strategy by incorporating the concept of competition against other platform partakers.

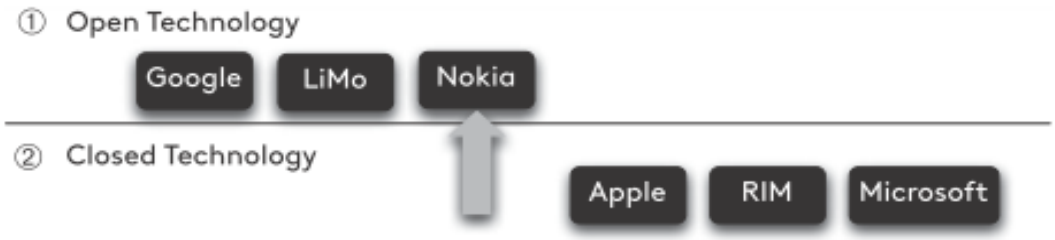
This paper addresses the following research question: How does mobile platform strategy affect generativity and competition on the platform? To answer this question, the paper first reviews previous literatures about mobile platform strategy and generativity in Section II. Section III will analyze the different types of competition on the platform that the platform owner has to face. The relationship between mobile platform strategy, generativity, and competition will be discussed in the following section.

THEORETICAL BACKGROUND

Mobile Platform Strategy

Mobile platform in this paper is defined as platform on which application components and consumers interact through multisided market mechanism (Rochet & Tirole, 2003; Holzer & Ondrus, 2011; Boudreau & Jeppesen, 2015). Mobile platform can be divided into two types: operating system (OS) platform and service platform. OS platform enables software applications to be developed and distributed on the mobile platform, whereas service platform connects the applications to the users. In this paper, mobile platform will be used to refer to OS mobile platform.

Figure 1
MOBILE PLATFORM STRATEGIES BASED ON THE DEGREE OF CONTROL (HOLZER & ONDRUS, 2011)



According to Holzer and Ondrus (2011), platform owners have taken different approaches which can be identified as closed technology approach and open technology approach (Figure 1). It is true that platforms cannot be put into the binary categorization and a spectrum of varying degree of platform strategies could exist between them. However, such conceptualization of platform strategies can be conducive in comparing the relatively distinguished features of the two most dominant mobile platforms, which are Android and iOS.

Open Platform Strategy

Mobile platform which enforces no or less control over the platform through open API (Application Program Interface) is considered open platform strategy (Remneland-Wikhamn, Ljungberg, Bergquist & Kuschel, 2011). As for platforms that pursue open strategy, there is no central architect who manages the platform. The Android platform of Google can be considered open platform when compared to Apple. By opening the platform for free to device manufacturers, Google has rapidly expanded its user base through network effect even though it joined the OS market later than its competitors including Symbian, Blackberry and Apple. Kenney and Pon (2011) explains that the reason why Google can afford to provide Android for free is that Google's core business is the search advertising business and it supports the mobile platform. As for now in the mobile platform industry, however, this type of platforms allow third party applications to be developed and maintained at a much lower cost, leading to more variety of innovations but less control over them.

Closed Platform Strategy

Platform providers using closed technology approach exercises control over the platform (Remneland-Wikhamn et al., 2011). The iOS of Apple is one of the platforms that take this approach. While taking a vertically integrated and closed platform strategy, Apple maintains high level of control on the entire ecosystem, from even the device to applications on the platform (Kenney & Pon, 2011). Gawer and Cusumano (2002) stated after analyzing Apple that its "closed garden" strategy has maintained the high quality of the component applications and also made it conducive to create favorable environment for its own applications. Kenney and Pon (2011) argue that Apple's strategy can be more advantageous in the long run, particularly when the platforms start to expand through vertical value chains. Apple already has developed cohesive user experience through platform compatibility, while its competitors with open platform strategy, including Google, would have difficulty in interoperating the platform on diverse technological devices.

Generativity

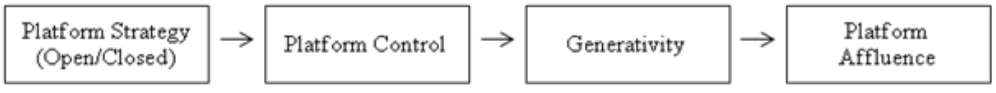
Generativity refers to "how easy innovators independent of mobile phone vendors and network operators can leverage on the mobile phone as a platform to develop new services and applications" (Nielsen & Hanseth, 2010). While identifying that generativity as a crucial factor for providing favorable environment for innovators, Nielsen and Hanseth (2010) argue that there is a tradeoff between generativity and usability. Whereas usability differentiates and attracts users in the short term, it is generativity that not only gives advantageous to the independent innovators but also meets the needs of the users in the long run.

Generativity and Mobile Platform Strategy

The generativity of the platform is directly or indirectly shaped by regulating the entrance of third parties into the platform (Elaluf-Calderwood et al., 2011). By "shaped", it means both facilitation and hindrance. According to Remneland-Wikhamn, Ljungberg, Bergquist and Kuschel (2011), it is generativity rather than openness that drives the affluence of platform and generativity is both facilitated and hindered by the control of actors on the platform (**Figure 2**). Openness refers to "an exchange or bargain of ideas and intellectual property with external associates such as customers, suppliers, partners, or competitors" (Remneland-Wikhamn et al., 2011, p.207), which does not equal to the 'open' from open technology approach as platform strategy. Based on this openness, it can be said that all mobile platform has openness but the degree of which the platform owner poses its controlling authority over the platform may vary.

Figure2

RELATIONSHIPS BETWEEN PLATFORM STRATEGY, CONTROL, AND GENERATIVITY



Five Factors of Generativity

Zittrain (2006) defines generativity as "a technology's capacity to produce unanticipated change driven by broad, heterogeneous, and uncoordinated audiences". Zittrain (2008) suggests five dimensions of generativity as a function of technology's capacity: capacity for leverage, adaptability, ease of mastery, accessibility, and transferability. Capacity for leverage refers to the extent to which objects can be utilized for accomplishments. If a technology enables more variety of accomplishments, it means that it is generative. Adaptability refers to the extent the technology can be used without modification and also to the extent how flexible the technology can be in order to increase its breadth of use. Ease of mastery reflects how easily the technology can be learned about. Accessibility is determined based on how easily the users can have an access to the use of the technology. Last but not least, transferability means the ability to transfer any technological changes to others.

Remneland-Wikhamn, Ljungberg, Bergquist and Kuschel (2011; 2012) have done a generativity analysis on iOS and Android based on the five factors of generativity (see Table 1).

Table 1
GENERATIVITY ANALYSIS OF GOOGLE AND APPLE

		Apple (iOS)	Google (Android)
Leverage		iPhone with built-in technologies. Standardized rules and templates. Third party programs look and feel familiar in the system.	Several device manufacturers. Less compulsory standardized rules. Increasing possibility for advancing programs into higher user experience.
Adaptability		Apple as a gatekeeper. Clear guidelines and restrictions. Risk of censorship.	Anyone can develop applications. Huge coordination challenge. Easy to remove and replace apps.
Ease of Mastery	Users	Apple's full control on value chain. Only allows App Store run by Apple as a source of distribution.	Various devices and GUI. No restriction on other sources of program distribution.
	Developers	Gives only one contact: Apple. Under control of Apple.	A stack of different manufacturers. OS and API disclosed.
Accessibility		Standardized tools and methods. Risks of rejection of platform access. Ensures accessibility once permitted to the platform.	More accessible system. System codes mostly revealed. Risks of damaging quality. High competition.
Transferability	Hardware	In-house management of technology.	Discussion with manufacturers.
	Software	Closed operating system. Built-in App Store is the only medium of technology transfer. User-to-user transfer is only possible through jailbreaking.	Based on open source software. User-to-user transfer allowed through various channels.

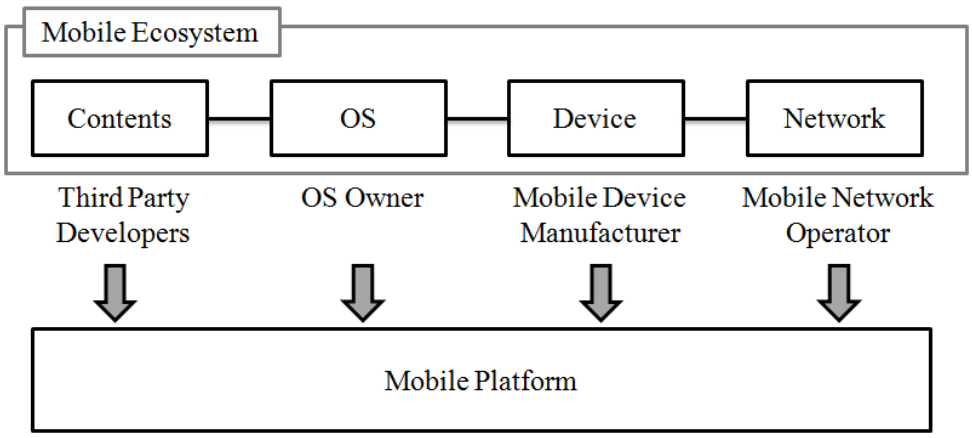
COMPETITION ON THE MOBILE PLATFORM

A. Actors of Mobile Platform

Actors on the mobile platform are identified based on the actors in the mobile ecosystem: third party developers, i.e. Mark Zuckerberg of Facebook, the platform owner, such as Google and Apple, mobile device manufacturers, i.e. Samsung and HTC, and mobile network operator, which greatly differs based on country/region, as shown in Figure 3.

The five dimensions of generativity defined by Zittrain (2008) involve third party developers, operating system owners and device manufacturers as an actor of mobile platform. In this paper, as the Zittrain's analysis on generativity excludes mobile network operators, and the capacity of mobile network operators in each region differs greatly from each other, only third party developers, OS owner, and mobile device manufacturer are further discussed.

Figure 3
ACTORS ON MOBILE PLATFORM



Third Party Developers (TPD)

Third party developers (TPD) are all individual or group developers who are not OS owner or device manufacturer. TPD may include enterprises, institutions, clubs, agencies, and individuals. They develop applications to expand their offline businesses, to provide themselves with the exact application they need, to make profit by pushing advertisements to the app users, to provide civil service, and to prove their capability by complementing their portfolio with it (Boudreau & Jeppesen, 2015). As for example, the most popular social network applications such as Twitter, Instagram, and Facebook are all developed by TPD.

Operating System Owner (OSO)

Operating system owners (OSO) are those who own the OS mobile platform such as Google of Android and Apple of iOS. More or less currently, Android and iOS account for respectively 82.8% and 13.9% of global smartphone OS market share in Q2, 2015, followed by Windows with 2.6% (International Data Corporation [IDC], 2015). To compete against each other and further expand its user base, OSO also develops proprietary applications such as Google Map of Android and iTunes of iOS, those that usually have critical attractiveness, to either attract new users or retain existing users.

Mobile Device Manufacturer (MDM)

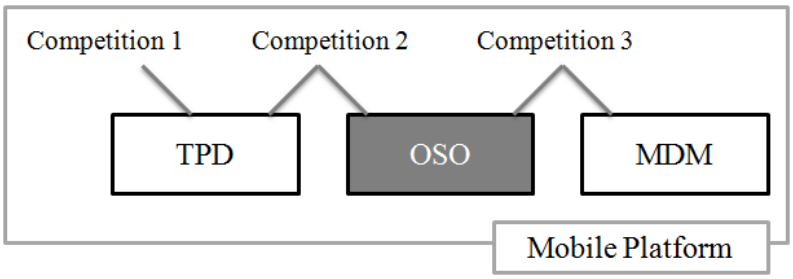
Mobile device manufacturers (MDM) are also a crucial actor in consisting mobile platform because software applications might involve embedded functions of hardware devices.

The importance of MDM as an actor highly depends on the relationship with OSO. Apple, for instance, has vertically integrated to incorporate hardware device manufacture while yielding no room for other MDMs to use iOS through closed platform strategy. However, as for Google, even though it once acquired Motorola to integrate MDM business, it keeps its open strategy so that other MDMs can use Android. Example of application made by MDM includes Samsung Pay, a mobile wallet application.

Competition between Actors

There are three types of competition in a mobile platform (Figure 4). The first kind of competition takes place between the TPD' applications and this area is where variations are continuously generated in order to differentiate oneself from the similar others, resulting in co-evolutionary development. The second kind of competition is identified between TPD's apps and OSO' apps. This type of competition occurs as OSO tries to protect its proprietary apps from those of TPD. The last kind of competition occurs between OSO's apps and MDM's apps. Depending on the platform strategy the platform pursues and the relationship between MDM and OSO, the range and scope of benefits and opportunity costs that OSO will face may vary greatly.

Figure 4
COMPETITIONS IN MOBILE PLATFORMS



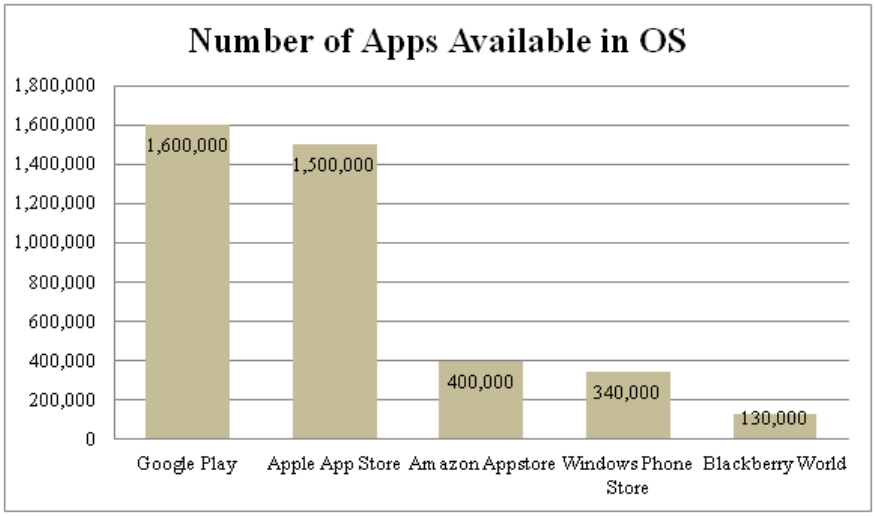
Competition 1: Between TPDs' Applications

Third party developers enter the market with various motivations and purposes. As the number of third parties increases, the variety of applications gets more increases. The increase in the variety of applications increases user base which leads to an increase in the number of complementors through network effect (Boudreau, 2012; Bygstad, 2010). This results in a virtuous cycle of expansion. The continuous expansion of complementors and users is accompanied by competition and cooperation between similar application software on the platform. Generally, an ecosystem consists of complementors competing against and cooperating with each other at the same time, an activity so called co-opetition (Brandenburger & Nalebuff, 2011). Market co-opetition leads to a chain of co-evolution among applications that affect technology innovation.

Different levels of control over the platform based on mobile platform strategy can affect how this type of competition is carried on. Eisenmann, Parker & Alstyne (2008) claim that the more the platform owner opens the platform to the third parties, the higher the rate of which innovations occur becomes. By the number of applications on each operating system, it is also

speculated that Android has resulted in a greater variety of components than iOS due its open platform strategy despite the fact that it is a latecomer in the industry (Figure 5).

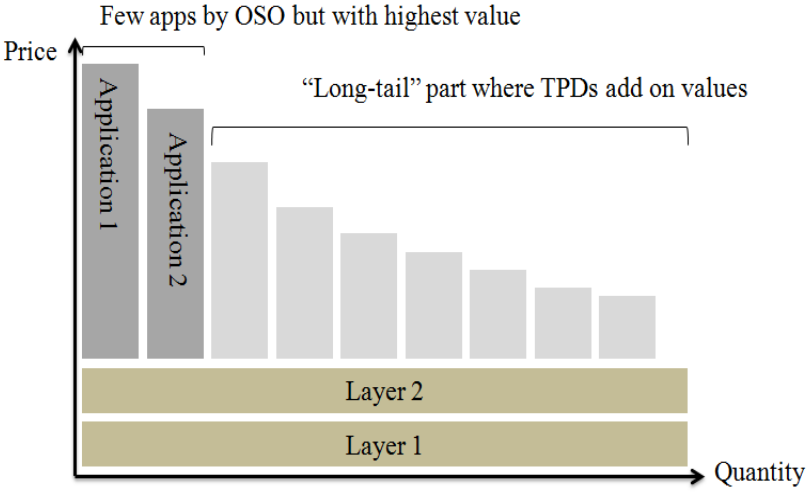
Figure 5
THE NUMBER OF APPLICATIONS ON EACH MOBILE PLATFORM (IDC, 2015)



Competition 2: Between OSO's Applications and TPDs' Applications

In order to retain existing platform user base and exploit the users, OSOs develop their own applications and aim to develop killer apps. Depending on which platform strategy the OSO pursues, the ease of competition from the OSO's perspective varies. Eisenmann et al. (2008) proposed long-tail model of mobile platform as in Figure 6.

Figure 6
LONG-TAIL MODEL OF MOBILE PLATFORM



According to the long-tail model, OSO can only concentrate on few apps with the highest value and thus yields the rest of the space to TPDs to add values on the mobile platform. Eisenmann et al. (2008) further explains that OSO should secure its foundation for profit by absorbing successful applications of TPDs. They suggest two rules in deciding which application to absorb: applications/functions with the highest value in the long-tail (i.e. Apple absorbed e-books and Google added Gdrive to absorb the function of DropBox), and functions that appear to be necessary in many applications on the mobile platform (i.e. PDF viewing function) (Eisenmann et al., 2008).

Competition 3: Between OSO's Applications and MDMs' Applications

Mobile device manufacturers are differentiated from TPD as a hardware provider. They can embed some of their proprietary applications or features into the devices. For example, calculator, note, and voice recorder are some of the MDM's applications that are pre-installed in mobile devices. Furthermore, they can develop more competitive application compared to TPD and OSO through co-developing the app with hardware device to result in differentiated functions.

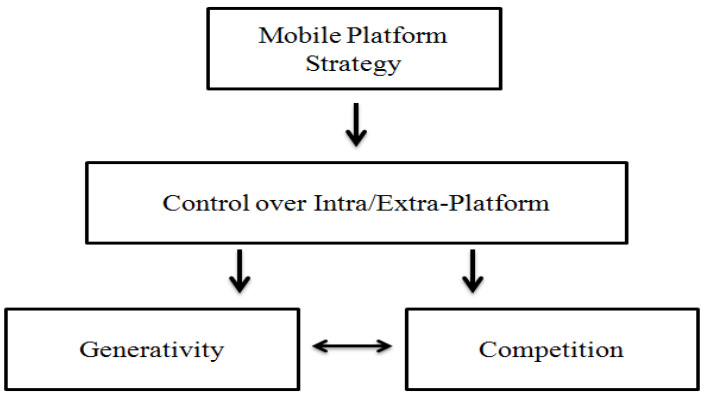
The importance of MDM on the mobile platform differs based on the relationship between the OSOs and MDM. Apple has vertically integrated to accommodate the role of MDM in its value chain and provides its OS to its own devices, thus MDM cannot be discussed regarding iOS. Google, on the other hand, opens its OS to diverse MDMs and also pursues open platform strategy to allow not only TPD but also MDM to develop and distribute its applications on the platform. To further demonstrate this type of competition, Samsung Pay which was suggested as an example of MDM's application, has effectively utilized the functions of Samsung device, including MST (Magnetic Secure Transmission) and fingerprint scanning, to attain higher competitive advantage over not only the OSO's app, Google Wallet, but also that of the competing MDM with different OS, Apple Pay.

COMPETITION AND GENERATIVITY

In Section II, this paper has reviewed the relationship between mobile platform strategy and generativity through **Figure 1** (Remneland-Wikhamn et al., 2011; 2012). In this section, the relationship between generativity and the different type of competition is analyzed. This paper identifies the relationship between the discussed factors as Figure 7.

Figure 7

RELATIONSHIPS BETWEEN PLATFORM STRATEGY, GENERATIVITY AND COMPETITION



iOS and Android's different mobile platform strategies (closed platform strategy and open platform strategy) resulted in different levels of control over intra-platform and also extra-platform (e.g. iOS ‘s application censorship and Apple’s vertical integration of production chain). As discussed in Section II through the generativity analysis of iOS and Android, the varying platform strategy and its control over the platform affect generativity differently. OSO’s varying control over the intra/extra-platform results in varying impact on competitions as discussed in Section III. In the case of Apple, it even excluded competition against MDM by vertically integrating its business to include both a function of MDM and OSO. This section will continue the discussion by identifying the relationship between generativity and competition under each operating system.

Open Platform Strategy (Android)

Third Party Developer

TPDs under open platform strategy have very high leverage because the platform owner hardly puts limits on TPDs' activities on the platform, leading to higher variety of application and thus increasing the leverage of users as well. Adaptability is also high to them but within the capacity that is provided by the hardware devices. However, ease of mastery can be quite low because TPDs have to test on diverse mobile devices from different MDMs. As for accessibility, it begins high but ends up quite low because the platform allows every TPDs to join the platform but it involves fierce competition to be accessed since then. Lastly, whereas transferability of hardware is low for TPDs under open platform strategy due to its MDM's control over it, transferability of software is high because existing features and functions are highly diverse, increasing the capacity of recombination and advancement.

Operating System Owner

Even the mobile platform pursues open platform strategy, being the platform owner gives OSO higher generativity than other partakers of the platform. Capacity of leverage and Adaptability is as high as TPD because it is provided with more or less the same environment to leverage on. However, it has higher ease of mastery is than TPD since it has better understanding about the platform and also has the authority to reflect major changes on the platform as platform owner. Accessibility is similar to that of TPD but does not get as low as TPD even after entering the platform because it has an authority to structure the OS to either embed or emphasize its own proprietary application. Transferability for OSO is identified to be similar to that of TPD.

Mobile Device Manufacturer

Mobile device manufacturer shows similar generativity with TPD regarding the factors that hardware devices are not involved. Therefore, leverage and ease of mastery in terms of software are parallel to those of TPD. Adaptability, however, can be higher than that of the other two players because of possibility to further extending the capacity through integrating it with the functions of hardware device. Accessibility is expected to be even higher than OSO. As OSO, it would find it easy to enter the platform under open platform strategy and it can also, to certain degree, embed its own proprietary applications. However, as it can better utilize the hardware functions, it might have more competitiveness than the other two actors to earn higher

accessibility. MDM has the highest hardware transferability while its software transferability is as high as that of the others.

Closed Platform Strategy (iOS)

Third Party Developer

Leverage of the platform is very high under closed platform strategy as well but not to the extent of open platform because the platform owner controls and limits the range of available features of applications on the platform. Meanwhile, adaptability is low under this strategy as the breadth of use isi highly regulated by the platform owner. Ease of mastery is high because the mobile platform is provided through devices made by only one MDM, which is also the OS itself, thus providing one standardized system to learn about. Accessibility is low at first because of the control but once it meets the requirements of the platform owner to join the platform, the accessibility gets higher. Therefore, it can be said that the ultimate accessibility of TPD applications is higher under closed platform than open platform. Last, transferability of both hardware and software is high but within the frame set by the platform owner because of standardization and regulation.

Operating System Owner and Mobile Device Manufacturer

In order to analyze mobile platform strategy of iOS, this paper combines the concept of two actors, OSO and MDM, to better reflect Apple's strategy to also control extra-platform factors. In effect, all five factors of generativity are expected to be high for OSO under vertically integrated and closed platform strategy. This is because its strategy grants itself to effectively curb TPD's excessive profits or advantages that can encroach the capacity of OSO, and it has much control over not only the software but also the hardware.

DISCUSSION

Discussions on the relationship between generativity and competition on mobile platform in Section VI can be reorganized as Table 2 and Table 3. These tables illustrate the varying levels of generativity per each actor under open and closed strategy respectively.

Table2

GENERATIVITY OF EACH ACTOR UNDER OPEN PLATFORM STRATEGY

		TPD	OSO	MDM
Leverage		Very High	Very High	Very High
Adaptability		High	High	Higher
Ease of Mastery		Low	High	Low
Accessibility		High →Very Low	High → Low	High → Medium
Transferability	Software	High	High	High
	Hardware	Low	Low	High

Table 3

GENERATIVITY OF EACH ACTOR UNDER CLOSED PLATFORM STRATEGY

		TPD	OSO & MDM
Leverage		High	Very High
Adaptability		Low	High
Ease of Mastery		Low	High
Accessibility		Low → Medium	High
Transferability	Software	High but within Frame	High
	Hardware	High but within Frame	High

In the Table 3 and Table 4, the actor with the highest generativity in each of the five factors is colored grey. An actor with higher or the highest generativity would have higher possibility of winning a competition. Under an open platform strategy, the strength in each dimension of generativity is comparatively distributed widely between the actors than in closed platform strategy. However, MDM has much more factors of generativity that are the highest among the partakers which implies its competitiveness over the other two, all other conditions being the same. This strategy does not grant OSO to have any special merit of being the owner of the platform other than ease of mastery. TPDs under this strategy generally do not have much competitiveness in nature compared to the other actors in the platform, ceteris paribus. This is not contradictory to the preliminary studies – the fierce competition among the TPDs due to no or less control of OSO over the platform possibly can result in the overall lower generativity.

Under closed platform strategy, all dimensions of generativity are higher for OSO & MDM. These show that generativity, from the platform owner's perspective, can be better managed under closed platform strategy even if open platforms lead to much higher diversity of applications and thus higher capacity of recombination and innovation through co-opetition. Having an environment that is more conducive to securing its own profits from TPDs is essential to platform owner. Apple, which is pursuing comparatively closed platform strategy, has effectively managed to control the platform quality and usability while maintaining profitability from the platform. Google, on the other hand, has gained higher diversity of applications and stakeholders through comparatively open platform strategy but has failed to secure its profit structure, bringing doubts on its sustainability.

Nonetheless, it is necessary to discuss the limitations that the above analysis contains. First, it does not provide information about the objective and independent measure on the importance of each factor of generativity to scale the overall generativity of mobile platform. Therefore, it is difficult to assert which platform generativity is better in terms of facilitating the overall generativity. Second, the above method does not reflect timeline, thus it cannot discuss long-term mobile platform strategy which might incorporate other stakeholders or even more diverse features within the existing categories of actors. Third, Apple and Google each has different main business through which they profit from. Therefore it cannot be generalized to, if any, other operating systems with similarly open or closed mobile platform strategy.

Theoretical Implications

Mobile platform operators, who are the OS owners, would seek profit through the platform business. Profitable platform should have a number of users and complementors and a variety of applications – this is critical to the platform since network effect between these factors amplifies the affluence of the platform (Boudreau & Jeppesen, 2015). Generativity of mobile platform is critical in attaining a variety of applications as it implies about the potential of the platform (Tilson, Sørensen & Lyytinen, 2013). Elaluf-Calderwood et al. (2011) therefore argued that a mobile platform operator, should exercise control over the platform, or closed platform strategy, to gain profit from its business. Remneland-Wikhamn et al. (2011) also argue that even though control hinders generativity to some extent as in application censorship, control also facilitates generativity as a certain unified frame is provided for TPDs to develop within. Remneland-Wikhamn et al. (2012) identified both Apple's iOS and Google's Android as a highly generative ecosystem but argued that there is a difference in how the generativity in each platform is configured and governed.

This paper suggests that in order to cultivate platform generativity, closed platform strategy would be more favorable than open platform strategy as it structurally allows the OSO more competitiveness in terms of generativity. Applications with more generativity would attract more consumers than other similar applications developed by other types of actors, which leads to higher competitiveness in the competitions against the other platform partakers. This finding supports the previous researches by Elaluf-Calderwood et al. (2011) and Remneland-Wikhamn et al. (2011; 2012) while at the same time suggests a new perspective that involves the concept of competitions among the platform partakers.

The finding of this paper also supports Hagiu and Halaburda (2010) who stated that uncontrolled platform which heavily relies on the autonomous TPD is not always effective in developing the mobile platform ecosystem. In the same context, Boudreau (2012)'s argument that uncontrolled platform may lead to low quality components which results in rather negative feedbacks from consumers. Wareham, Fox & Giner (2014) further state that applications on the platform can be not only a desirable variance but also an undesirable variance which can negatively affect the overall platform's attractiveness to potential users if produced indiscriminately. The finding of this paper does not consider application quality but assume that all other conditions are the same. However, the finding is still parallel to these previous researches. Wareham et al. (2014) argue that technology ecosystems should implement variance reducing mechanisms to control the quality of available applications on the platform.

On the other hand, the theory of network effect (Boudreau, 2012; Bygstad, 2010) was more conducive to explain Android of Google's rapid expansion and it better supported no or less control over the platform for generativity, or open platform strategy. However, more generativity of the platform does not necessarily mean more profit for the mobile platform operator. Elaluf-Calderwood et al. (2011) claim that the balance between control and generativity is crucial for OSOs to take economic/social/technical advantage from the platform business. The less the control over the platform, the more the variety of the applications available, which in turn might contribute to the platform affluence. However, the less the control over the platform, the less the easiness for the mobile platform operator to manipulate the system for its own profit it gets.

Future Research

The identification of three types of competition on the mobile platform and how competitiveness of each actor in terms of generativity relates to the competitions suggest several avenues for future research.

There is a possibility that competition between the TPDs has been over-generalized despite the variance among TPD's applications as also stated in the researches by Wareham, Fox & Giner (2014). In particular, some TPDs are companies with their own business that already has a considerably large consumer base which makes it comparatively easier for them to attract users on the mobile platform. For example, mobile payment applications are mostly developed by the relevant financial institutions such as a bank or a credit card company. Some TPDs are an individual or a group who does/do not have an existing user base from outside the platform. For example, a simple note application or a camera application can be developed by an individual or a group without a existing consumer base. A further research on competitions among the different types of TPDs would contribute to the better understanding of the phenomenon on the platform.

A further research can be done to identify the level of each dimension of generativity in more detail with an objective and independent measure. This would allow scaling of the overall generativity of mobile platform and a comparison between the two mobile platforms. An objective measure of generativity would also relate to the impact of other strategies pursued by the mobile platform operators, Google and Apple in this case. The business strategies of the two corporations are not a factor that can be neglected when discussing the profitability of mobile platform. For example, even though Android seems as it is not as much reasonable as iOS to sustain its platform business, as a company with much content and information, Google might find having its own mobile ecosystem for its own cluster of applications. In addition, not having its own platform but relying on Apple's iOS or other platforms can be more expensive and riskier than having Android. Relating such strategies to objectively analyzed platform generativity would give a more rationalized insight on the relationship between the two factors and further on the competition between the platforms.

How competition, cooperation, and co-opetition appear in each type of competition among the actors would be another possible research topic. Particularly, how cooperation and co-opetition affect generativity and, if applicable, how the generativity in these two cases are different from that in competition would be a contributive research topic for analyzing the generativity under more various platform activities. Furthermore, it would be also meaningful to analyze the generativity of the platform in relation to the long-tail approach illustrated in **Figure 6** in Section III. How would the two principles of the long-tail approach affect the platform generativity and overall health?

CONCLUSION

Competition between OSOs are also taking place regardless of the different objective to operate the mobile platforms. The applications developed by the OSOs are often complementary of each other, which means that they are provided as a software package that interoperates. For example, Google, which has had its main business in search engine and advertisement business prior to the invention of mobile internet, offers Google Map, Gmail, and Youtube applications on Android connected through a single account. Apple is also well-known for its ecosystem of interoperable applications which include iBook, iTunes, and iCloud applications. Lee, Venkatraman, Tanriverdi & Iyer (2010) state that customers prefer to use

software product as a system of complements than as individual products due to the convenience coming from interoperability. The more actively the personal data such as schedule, photos, and social networks are input, the higher the switching cost becomes. This results in lock-in effect within the ecosystem that helps retain the existing users.

Mobile platform owners, ought to make the most out of its platform to obtain consistently higher competitiveness against each other for sustainability. Furthermore, for sustainability of the platform, it is crucial to consider the generativity as explained in Section II. In this regard, this paper might bring a new insight in analyzing how the generativity affects the competition on the platform and how the mobile platform owner with different level of platform openness can have an advantage out of it by better managing the generativity.

ACKNOWLEDGEMENT

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