

Interrelationships between Intangible Assets and Business Performance

ความสัมพันธ์เชื่อมโยงระหว่างสินทรัพย์ที่ไม่มีตัวตนกับผลประกอบการธุรกิจ

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บทคัดย่อ

บทความวิจัยเชิงประจักษ์นี้มีวัตถุประสงค์เพื่อศึกษาความสัมพันธ์เชื่อมโยงระหว่างองค์ประกอบของสินทรัพย์ที่ไม่มีตัวตนกับผลประกอบการของบริษัท โดยสินทรัพย์ที่ไม่มีตัวตนนั้นประกอบด้วยสามส่วน ได้แก่ องค์ความรู้ของพนักงานและโครงสร้างพื้นฐาน ประสิทธิภาพการดำเนินงานในองค์การ และความพึงพอใจของลูกค้าภายนอก ตามแนวคิดของเทคนิคการประเมินผลเชิงดุลยภาพ (Balanced Scorecard) ผู้วิจัยได้ส่งแบบสำรวจไปยังผู้บริหารระดับสูงของบริษัทที่เป็นสมาชิกของสภาหอการค้าแห่งประเทศไทย จำนวน 3,084 บริษัท โดยบริษัทที่สำรวจนั้นจะมีความหลากหลายทั้งในด้านกลุ่มธุรกิจ ขนาดของธุรกิจ และอายุขององค์การ การสำรวจได้รับการตอบรับจากผู้บริหารเป็นจำนวนทั้งสิ้น 304 บริษัท ซึ่งผู้วิจัยได้นำข้อมูลที่ได้นำไปวิเคราะห์เชิงสถิติด้วยเทคนิคการจำลอง

แบบสมการโครงสร้างเชิงเส้น (Structural Equation Modeling) ผลการวิเคราะห์ พบว่าสินทรัพย์ที่ไม่มีตัวตนทั้งสามส่วนนั้น เป็นกลุ่มที่แยกกันได้อย่างชัดเจน นอกจากนี้ ยังพบว่าสินทรัพย์ที่ไม่มีตัวตนนั้นมีการเชื่อมโยงกันภายในเป็นลูกโซ่ก่อนที่จะมีผลกระทบต่อไปยังผลประกอบการของบริษัท โดยเริ่มจากองค์ความรู้ของพนักงานมีผลกระทบต่อและเชื่อมโยงกับประสิทธิภาพการดำเนินงานในองค์กร และประสิทธิภาพการดำเนินงานในองค์กรมีผลกระทบต่อความพึงพอใจของลูกค้าภายนอก และความพึงพอใจของลูกค้ามีผลกระทบต่อไปยังผลประกอบการของบริษัทในที่สุด

ผลจากงานวิจัยนี้ จะทำให้ผู้บริหารระดับสูงในบริษัทที่มีขนาดต่างๆ กัน อยู่ในกลุ่มธุรกิจต่างๆ กัน และอายุขององค์กรต่างๆ กัน ได้ตระหนักถึงความสำคัญของการบริหารสินทรัพย์ที่ไม่มีตัวตนได้อย่างเหมาะสมในอันที่จะส่งผลต่อไปยังผลประกอบการบริษัทของตน ผู้บริหารที่ให้การส่งเสริมการพัฒนาองค์ความรู้ให้กับพนักงาน จะทำให้สามารถนำความรู้ไปพัฒนาประสิทธิภาพการดำเนินงานในองค์กร เมื่อกระบวนการทำงานในองค์กรเป็นไปอย่างมีประสิทธิภาพแล้ว ลูกค้าภายนอกจะได้รับความพึงพอใจจากการให้บริการที่ดีจากองค์กร และในที่สุดจะส่งผลให้องค์กรมีผลประกอบการดีขึ้นจากรายได้ที่เพิ่มขึ้น อีกทั้งองค์กรที่มีการกำหนดกลยุทธ์ระยะยาวให้กับสินทรัพย์ที่ไม่มีตัวตนทั้งสาม จะนำไปสู่การเติบโตทางธุรกิจที่ยั่งยืน

คำสำคัญ: สินทรัพย์ที่ไม่มีตัวตน การประเมินผลเชิงคุณภาพ ผลประกอบการธุรกิจ การจำลองแบบสมการโครงสร้างเชิงเส้น กลยุทธ์ธุรกิจ

Abstract

This empirical research aims to explore the interrelationship of three intangible asset elements, learning and growth, internal business process and external structure, and business performance using the Balanced Scorecard. The interrelationships between intangible assets and business performance were investigated in companies of various business sizes, business sectors and age of business establishments. A total of 3,084 questionnaires were distributed to the top management of member companies of the Thai Chamber of Commerce. Respondent questionnaires were screened for completeness and reliability. Qualified responses totaled 304 and the data were analyzed using the Structural Equation Modeling technique. Each of the three elements of intangible assets, learning and growth, internal process and external structure were found to belong to different groupings from each. The types of

business, i.e. non-service and service sectors did not yield significantly different results. However, the interrelationship results of the business size and the age of business establishment are significantly different. Moreover, the commonly assumed interrelationships were confirmed, i.e. the element of learning and growth has an influence on the internal business process, the element of internal process has an effect on external structure and the element of external structure in turn has an effect on business performance.

These findings will enable top management in each size of business, business sector and age of its company to understand the interrelationships and importance of elements of intangible assets (learning and growth, internal business process and external structure) and business performance. Now that the interrelationships are positively identified, long-term strategies for intangible asset management may be formulated and recommended to management. Budget allocation and management can now be more properly focused and controlled to increase sustainable competitive advantage.

Keywords: Intangible Assets, Balanced Scorecard, Business Performance, Structural Equation Modeling, Business Strategy

Introduction

The current economic crisis, which began in 2008, has encompassed all business sectors. Some businesses have gone bankrupt and have had to close down. Financial profit alone could not guarantee the long-term survival of companies in the economic crisis and a drastically dynamic business environment. Profit and loss are normally used as the main financial performance indicators in the balance sheet and annual financial reports. However, annual financial reports might not reflect or influence the crafting of long-term strategies.

The investment of tangible assets such as equipment, machinery, buildings, etc. is also recorded in the balance sheet. However, the intangible cost of expenses in brand building, customer database, training, product development, information technology, etc. are usually treated as part of the operation cost and marketing expenses. This simple accounting record mechanism has no linkage with long-term strategies and budget allocation. Consequently, intangible assets have been widely studied during the last decade.

Intangible assets are defined as non-

financial assets without physical substance that are held for use in the production or supply of goods or services or for rental to others, or for administrative purpose (Epstein and Mirza, 2005). 'Intangible asset' is an accounting term, while intellectual capital is a term used in the management field, although they both refer to the same thing. An increasing share of market value in this era is not represented by inventory or physical assets.

This research explores the interrelationships of intangible assets, learning and growth, internal process and external structure to business performance. The model is an attempt to refine and extend the balanced scorecard strategy map. The model fit testing process is illustrated in

Figure 1. The initial step in the analysis of the data focuses on examining the frequency distribution and the meaning and standard deviation for each item or variable considered in this research. The next step in data analysis is assessing the validity of measures. Here the study uses item-total correlation, confirmatory factor analysis and the Cronbach's alpha coefficient. The initial data analysis, reliability and correlation analyses were performed using the SPSS statistical package. Furthermore, the Structural Equation Modeling EQS program (Bentler, 1995) is used to perform the confirmatory factor analysis, discriminant validity tests and testing of the structural model.

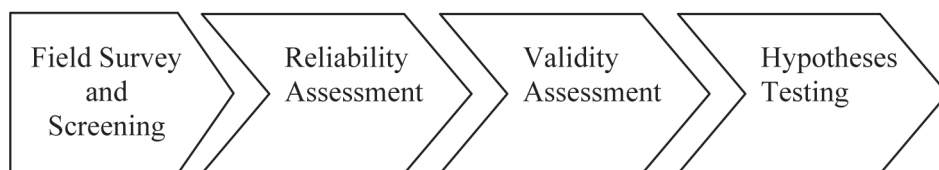


Figure 1: Model Fit Testing Process

Literature Review

During the last two decades, several studies such as Kaplan and Norton (1992), Sveiby (1997), Edvinsson and Malone (1997) and Bontis (2000), have variously attempted to categorize intangible assets. Common categories of intangible assets are as follows:

- Customer/External Structure/Relation Capital
- Internal Process/Structural Capital
- Learning and Growth/Human Capital/Competence Structure

There are several intangible asset indicators in each intangible asset element. By using the categories developed by Hall

(1993: 607-618), Sveiby (1997), Roos, et al. (1997) and Shaikh (2004: 439-448), the intangible assets were reviewed and classified

into a framework of internal structure, external structure, and employee competence as shown in Table 1.

Table 1: Framework of Intellectual Capital/Intangible Assets Indicators

Intangible Assets	Sub-elements
External Structure	Brands Customer Loyalty Customer Satisfaction
Internal Structure or Internal Process	Process Improvement Innovation Information Technology
Employee Competence or Learning and Growth	Know-how Knowledge Competency Engagement

The balanced scorecard is the most well-known approach for converting intangible assets into tangible outcomes, although its original intent was not meant to be a measure for intangible assets, as discussed by Marr and Adams (2004: 18-27) and Mouritsen, Larsen, and Bukh (2005: 8-27). Seggie, Cavusgil, and Phelan (2007: 834-841) made a case for the balanced scorecard to be the measurement tool in marketing to measure non-financial assets and provide the organization with a long-term perspective. The balanced scorecard is at least partially forward-looking and partially geared toward the long-term performance of the firm. The balanced scorecard concept has been used to

examine the performance of a bonus plan in a major financial services firm. Ittner, Larcker, and Meyer (2003: 725-758) recommended that future research on balanced scorecard adoption and performance consequences must move to encompass the entire implementation process.

Kaplan and Norton (2004) developed the balanced scorecard strategy map to explain the relationship between learning and growth, internal process and customer perspective. The concept of interrelationships separates the balanced scorecard from other performance management systems. The measures appearing on the scorecard should be linked together in a series of

interrelationships to tell the story of the organization's strategy: increasing promotional expenses will lead to an increase in brand value, increased brand value will lead to higher sales revenue, and the investment of human capital will create continuous learning and growth in the organization. When the employees have more experience and knowledge, they can create the internal process which serves and fulfills customer satisfaction. Profit and revenue are the final outcomes of this causal chain.

There are many functions involved in the process of aligning the intangible assets with strategies. Each function has to build its own intangible assets in order to deliver and convert them to financial performance. Chaichan Chareonsuk, and Chuvej Chansa-ngavej (2006) found that most companies in the Stock-Exchange of Thailand have a functional organization structure.

The intangible assets are linked to performance. The balanced scorecard has been widely used in formulating business strategy. Green and Ryan (2005: 43-52) proposed the framework of intangible valuation areas for facilitating the systematic and repeatable identification of intangible asset balanced scorecard. The framework is designed to align the value drivers of intangible assets with the business strategy.

Understanding the value of its intangible assets helps a business to develop, sustain and enhance its mission effectiveness and competitive advantage. Chaichan Chareonsuk, and Chuvej Chansa-ngavej (2008: 812-828) proposed the framework for intangible assets management in business and industrial organization. The framework refines the strategy map concept in the balanced scorecard approach for use in intangible assets management. Intangible assets belong to different functional departments. They must be carefully monitored and properly nurtured by the organization. Intangible assets depend not only on the type of functional department, but also the type of industry.

Research Design and Methodology

In this research, the balanced scorecard strategy map (Kaplan and Norton, 2004) is used to provide a framework 1) because each intangible asset element contains sub-elements of intangible assets (See Table 1 for sub-elements of each intangible asset), and 2) because of the interrelationships between intangible assets and business performance. Thus, the main hypotheses H1-H3 in this study are defined in terms of the relationship of intangible assets and business performance as follows:

H1: Learning and Growth is positively related to Internal Process.

H2: Internal Process is positively related to External Structure.

H3: External Structure is positively related to Business Performance.

Learning and growth is an intangible asset element. Several previous empirical studies established that learning and growth have a direct, positive relationship on business performance. Huselid and

Becker (1997), Hitt, et al. (2001: 13-27), Liu and Tsai (2007: 734-743) examined the relationship between learning and growth and business performance. Research hypothesis H4 is used for testing the relationships between learning and growth and business performance. The research hypothesis testing model is shown in Figure 2.

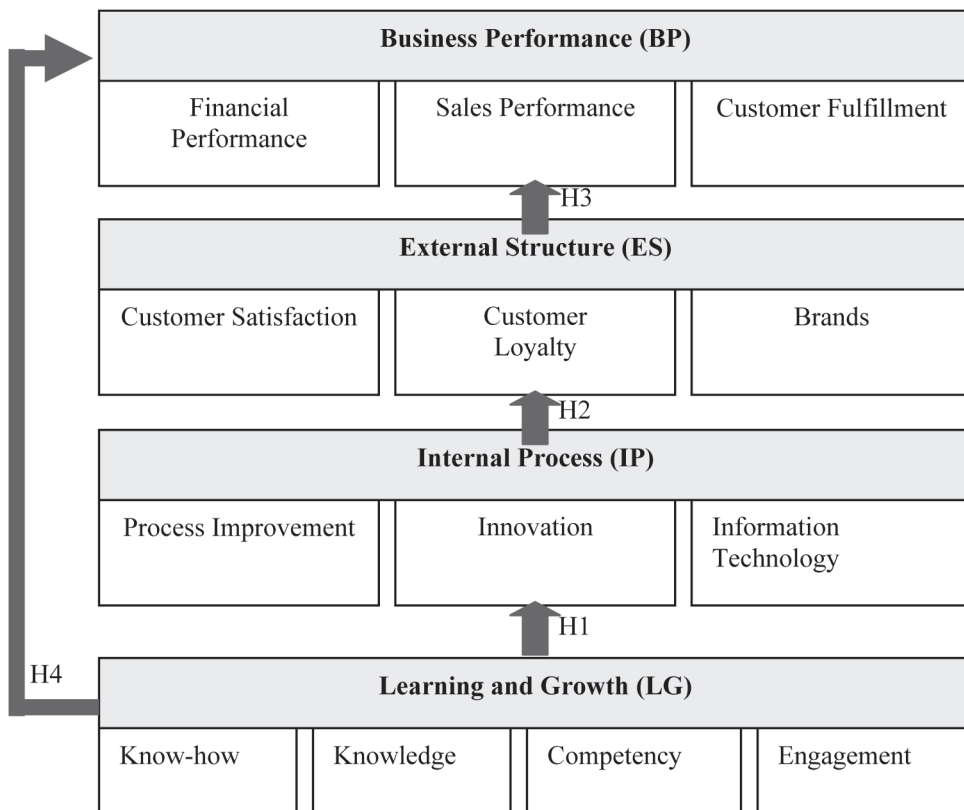


Figure 2: Research Hypotheses Testing Model

H1: Learning and growth is positively related to internal process.

H2: Internal process is positively related to external structure.

H3: External structure is positively related to business performance.

H4: Learning and growth is positively related to business performance.

There have been several studies on the testing and acceptance of criteria. Acceptance of criteria in each statistical testing of previous studies (Byrne, 2006; Ferguson, Paulin, and Bergeron, 2005: 217-234; Hair, et al., 2006; Nunnally and Bernstein, 1994; Steenkamp and Trijip, 1991: 283-299) are shown in Table 2.

Table 2: Acceptance Criteria in Each Statistical Testing

Testing	Purpose	Acceptance Criteria
Reliability Assessment	Questionnaire Consistency	Cronbach's Alpha Exceed 0.7 Item-total exceed 0.4
Convergent Validity	Scale Correlation with Other Measures of the Same Construct	CFI (Comparative Fit Index) exceed 0.9 NNFI (Non-Normed Fit Index) exceed 0.9 RMSEA (Root Mean Square Error of Approximation) lower than 0.05-0.08 AOSR (Average off-diagonal absolute standardized residual) lower value to zero, better fit t -value exceed 2.0 at $p < 0.05$ Standard loading exceed 0.6
Discriminant Validity	Construct Different from the Other Construct	χ^2 constrained - χ^2 unconstrained > 3.84 , $p < 0.05$ correlation+2 (std. error) < 1
Hypotheses	Model Fit	χ^2 / df Ratio between 1-3 CFI exceed 0.9 NNFI exceed 0.9 RMSEA lower than 0.05-0.08 AOSR lower value to zero, better fit t -value $> \pm 2.58$, $p < 0.01$ t -value $> \pm 1.96$, $p < 0.05$ t -value $> \pm 1.65$, $p < 0.1$

Prior to the hypotheses testing, there are several testing steps as described in Figure 1. The details of empirical results in each step are explained as follows:

Step 1: Field Survey and Screening

The questions in each intangible asset element are mainly constructed from Bontis (2000), Roos, et al. (1997), Olve, Roy, and Wetter (1999) and Hinshaw (2005: 37-48). The questionnaires of Bontis (2000) focus on learning and growth, while Hinshaw (2005: 37-48) intends to find the relationship between external structure and business performance. Thus, most of the learning and growth questionnaire in this study is adapted from Bontis (2000), while the external structure questionnaire is modified from Hinshaw (2005: 37-48). To complete the questionnaire, relationships between internal process and other intangible asset sub-elements in learning and growth and external structure are adapted from Olve, Roy, and Wetter (1999) and Roos, et al. (1997). The design of the questionnaire in the present study follows the three elements of intangible assets, namely learning and growth, internal process and external structure. The number of questions in each element is shown in Appendix A.

The questionnaire was distributed to a total of 3,084 top executives of registered member companies in the Thai Chamber of

Commerce during September-November, 2008. The subjects varied in business size, business sector and age of business establishment. There were 361 respondents. Some of them were incomplete, leaving 304 qualified responses, which were then used in further analysis. The next step of the model testing procedure, reliability assessment, is shown in Figure 1.

Step 2: Reliability Assessment

Only one question was removed because it had the lowest correlation of all item-totals at 0.3. All Cronbach's alphas are higher than 0.7. Therefore, on the basis of these preliminary analyses, each item seems to make a good contribution and is sufficiently reliable. All questionnaires in each intangible asset element are consistent and reliable.

Step 3: Validity Assessment

There are two types of validity assessments, convergent and discriminant. The convergent validity analyzes whether the scale correlates positively with other measures of the same construct. The result of convergent validity shows that the intangible assets indicator in each construct/intangible asset positively correlates with other indicators in the same construct. The knowledge, know-how, competence and engagement positively correlate in learning

and growth. Process improvement, innovation and IT positively correlate in the internal process. Customer satisfaction, customer loyalty and brand recognition positively correlate in the external structure. Lastly, finance, sales and customer fulfillment performance positively correlate with the business performance.

The discriminant validity analyzes the degree that each construct variable differs from other construct variables. In this study, each of the four study elements, learning and growth, internal process, external structure and business performance were

found to belong to different groupings from other elements.

Step 4: Hypothesis Testing Results

The results of 304 respondents from various sized businesses, age of business and business sector were analyzed. There are ten variables affecting business performance. The hypotheses testing were conducted based on the diagram as drawn by using the EQS program shown in Appendix B. The testing results in Figure 3 are simulated by the EQS program.

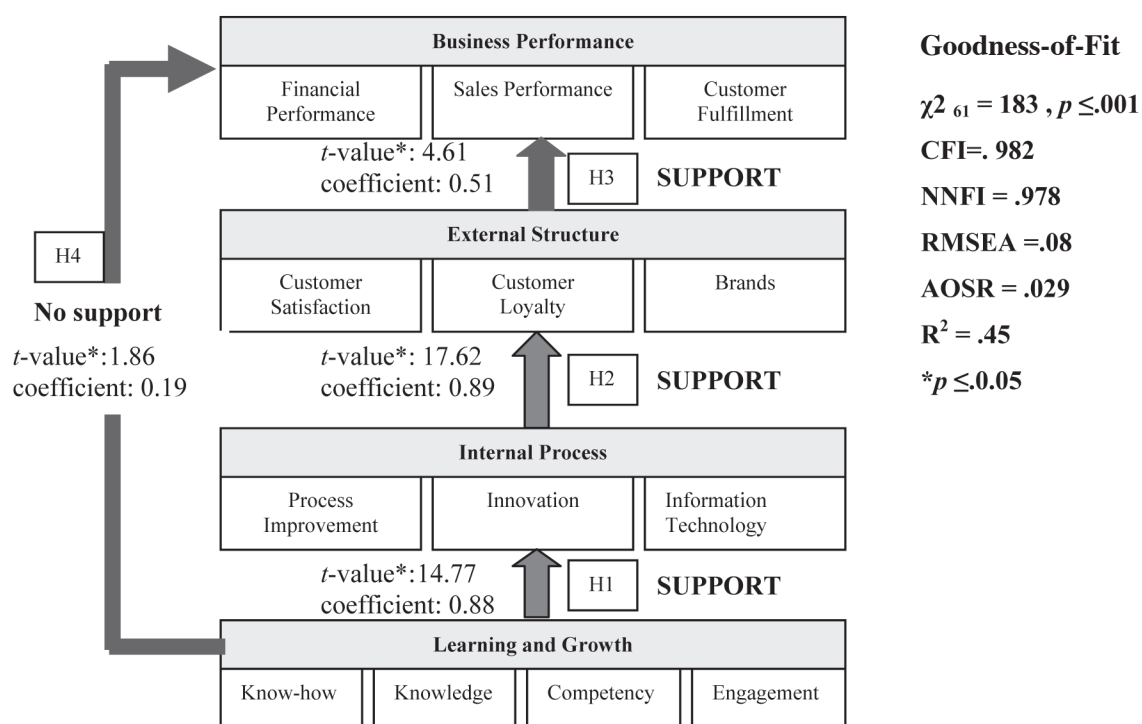


Figure 3: Structure Model Results

All diagnostic indicators show significant goodness-of-fit statistics, CFI=0.982, NNFI=0.978, exceeding 0.9. The RMSEA is equal to 0.08 and a small AOSR. With the large sample size of 304 respondents, the significant chi-square and degree of freedom ratio is acceptable. The model fit relative to the goodness-of-fit statistic results. All hypotheses are supported, except the relationship between learning and growth and business performance at $p \leq 0.05$. This structural model solution produces an R² value of 0.45, which suggests that the structural model explains 45 percent of the variance in business performance. It has very strong explanatory power for this type of models compared with the previous studies of Cabrita and Vaz (2006:11-20) (0.44); Wang and Chang (2005: 222-236) (0.43); and Bontis, Keow, and Richardson (2000: 85-100) (0.37).

Conclusion

Intangible assets are involved in all levels of a value chain in business. The foundation of intangible assets in business is learning and growth. Knowledge, know-how, employee competence and engagement are the intangible assets in learning and growth, having positive effects on the internal process (process improvement, innovation and information technology), which confirms the result of Wang and

Chang (2005: 222-236). Internal process exerts a positive effect on external structure. Finally, external structure affects business performance. Learning and growth is the primary foundation factor leading to business performance. Establishment of the linkages of these three elements confirms the strategic mapping of the balanced scorecard. However, the hypotheses testing results do not support the existence of a linkage between learning and growth and business performance. Still, the present study is able to establish that the learning and growth element has an indirect effect on business performance through internal process and external structure, the “value chain” in the balanced scorecard. The company builds learning and growth (knowledge, know-how, competence and engagement) to support the internal process. The internal process creates the external structure value. When the customers are satisfied, the sales and profits are delivered in terms of business performance.

Managerial Implications for Industrial Management

The questions that received top scores from the respondents in each intangible asset element would provide a good indication of the kind of long-term strategies that can be adopted by business

practitioners. These intangible asset sub-elements derived from the questionnaire outcomes are incorporated into the appropriate intangible asset sub-elements in Figure 4. For example, the item of intangible asset sub-element “know-how” that received the top score in that sub-element is “Training is required for the new staff.” Thus, this particular item could be used as the guideline for establishing long-term business strategies, which would lead to high business performance in the end.

Several interesting observations may be made based on the grouping of the responses by business size, establishment age, and business sector as follows:

Grouping the responses by business size - SME and large - a) Large businesses: all the hypothesis test results for the large businesses are found to follow the same patterns of overall analysis in Figure 3; b) SME businesses: all the four hypotheses of SMEs are supported in this case, including H4, the interrelationships between learning and growth and business performance. The support found in the case of SME businesses could perhaps be explained in terms of a more direct chain of command in SME businesses relative to the more complex organization in large businesses. That is to say, when a SME business improves its human resources by way of training, employee engagement, knowledge

management and so on, the effects are more directly felt in its business performance. This result confirms the work of Alasadi and Abdelrahim (2008: 50-62). They found that learning and growth is positively related to successful business performance. SME organizations tend to be lean, efficient, and have a relatively simple command line.

Grouping the responses by establishment age, a) Old businesses (more than 10 years): all the hypothesis test results are found to follow the same pattern of overall analysis in Figure 3; b) Young businesses (less than 10 years): there is no relationship between external structure and business performance. The reason might be because they are still in the process of establishing customer relations and developing customer loyalty as well as brand awareness. However, interrelationships are found between learning and growth and business performance. The reason might be due to the simple command line in such an organization.

Grouping the responses by the type of business sectors, hypotheses testing results of the service sector follow the same pattern as the non-service business sector and overall business sectors. Therefore, it could be concluded that no relationship was found between learning and growth and business performance, no matter what the

type of business sector.

Intangible assets are the strategic key for long term profit prospects and a sustainable competitive advantage. The setting of key performance indicators and investments has been allocated and monitored by the guideline strategies in Figure 4. Some guidelines for improving business performance in each intangible asset are discussed below:

1) Learning and growth is the capacity of employees to act in a wide variety of situations. Human resources are the most valuable asset of a company in the highly competitive market. It is the one asset that creates uniqueness for the company and differentiates the company from competitors. Knowledge is one element in the learning and growth perspective. Hiring the best candidate for the company, sharing knowledge, and on-the-job training are guidelines for improving employee knowledge. Constantly upgrading skills with an effective training road map is necessary to enlarge employee capacity. As the business expands, a communication gap might develop between management and employees. Frequent communication and constant consultation with all levels are the factors that increase teamwork and move the company uniformly forward in the same direction.

2) Internal process includes process improvement, innovation, and information technology. The global market is wide open and highly competitive. Products often have to comply with existing international standards, or risk being disqualified from the international market. Gaining customers' input on new product ideas is the foundation for creating new products and supporting customers' needs. Information technology is necessary to support the information flow of internal and external communication. When the company improves the internal process, the outcomes are reaped directly by customers.

3) External structure encompasses brands, customer satisfaction, and customer loyalty. Customers are invaluable and the key success assets in any business. Continuous contact with customers to get to know and fulfill their demands and receive their feedback helps improve the products and internal process. When the company understands the market and its customers, the company knows how to sustain a long-term customer relationship. Brand name constitutes a valuable intangible asset. Frequent and sustained brand building and communication with customers and familiarization with their perceptions and expectations are strategic guidelines.

When companies have crystallized long-term strategies as set out in the above discussion, they would have good management and monitoring tools in hand. Creating a culture of measurement-driven

intangible assets and business performance helps top management understand how to derive a greater return from intangible assets investment.

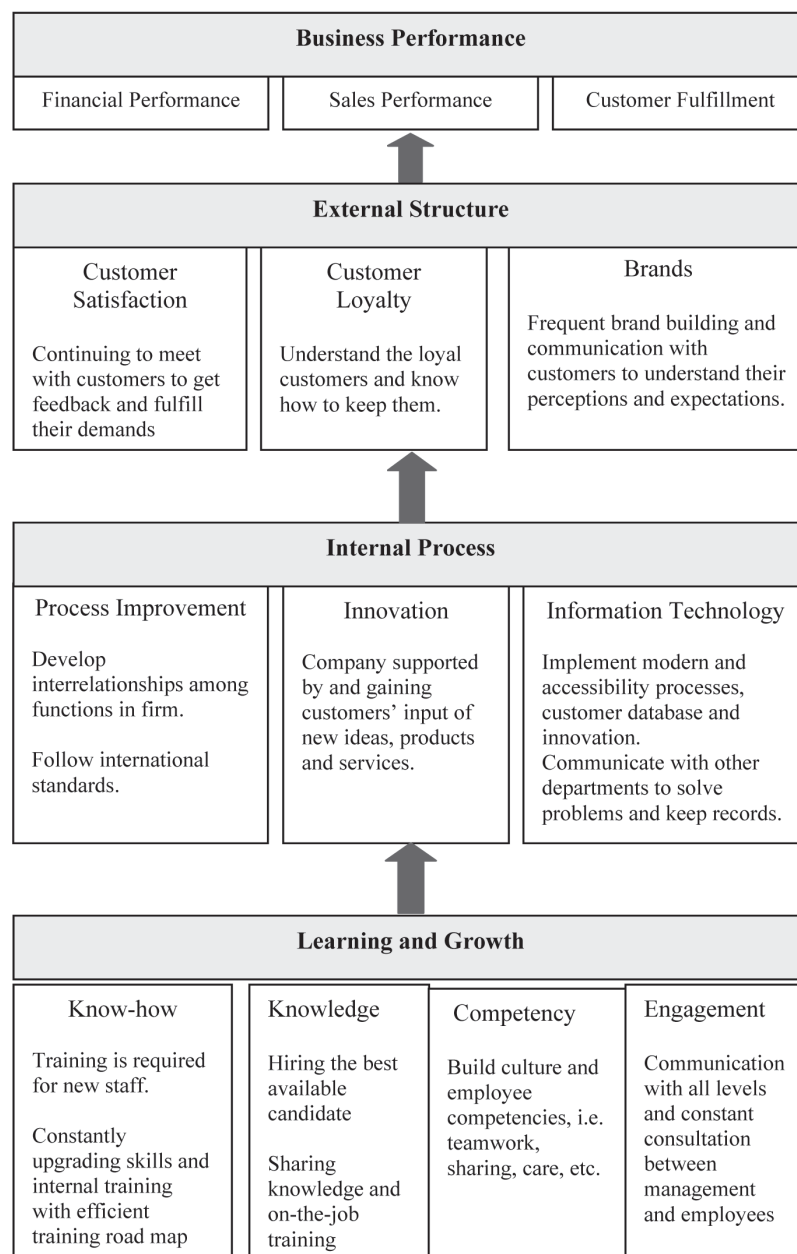


Figure 4: Intangible Assets Strategies to Improve Business Performance

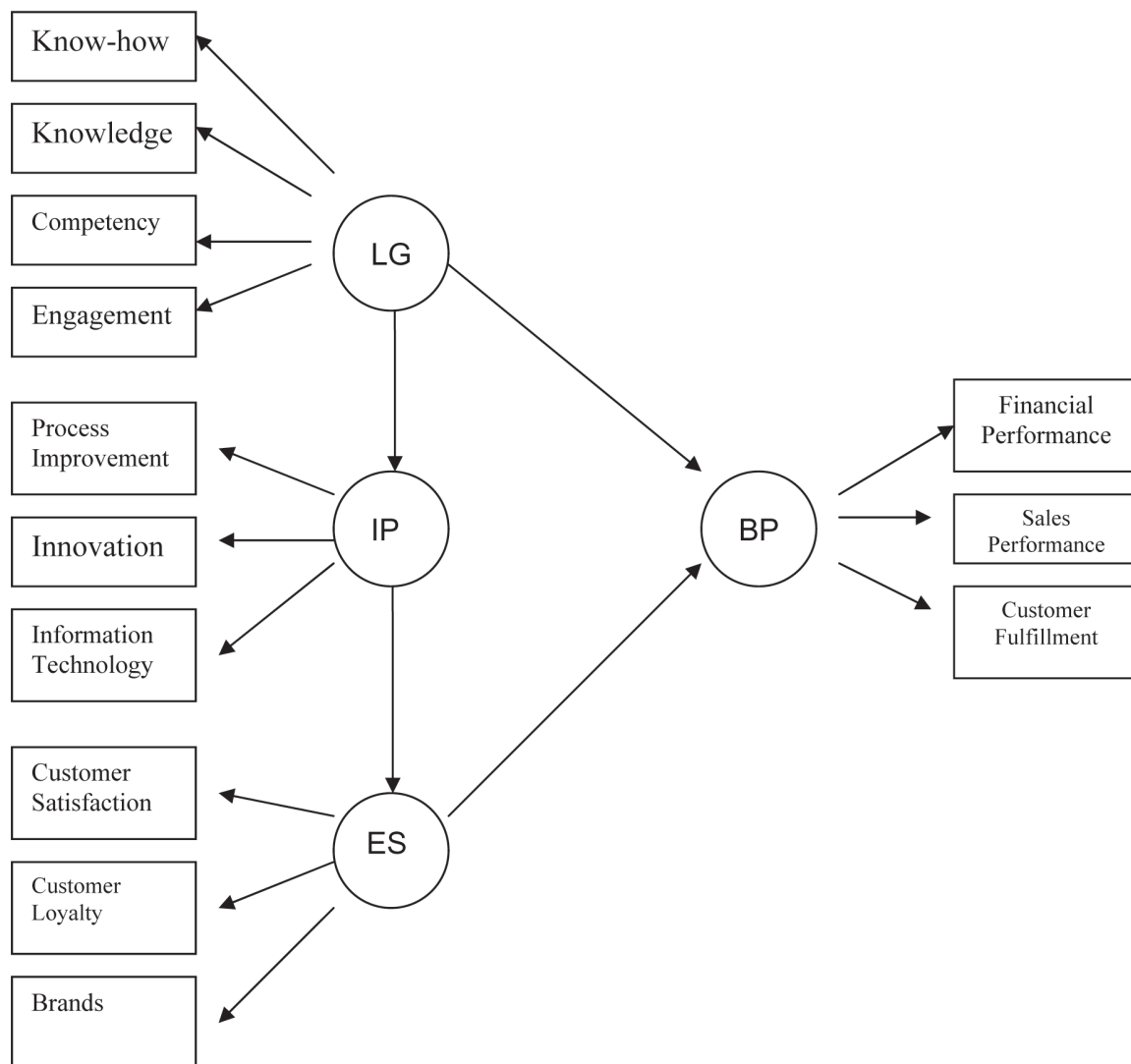
Appendix A

Number of Questions in Each Element of the Questionnaire

Questionnaire Elements	Sub-elements	Related Survey Questions
Learning and Growth	Know-how	5
	Knowledge	5
	Competency	5
	Engagement	5
Internal Process	Process Improvement	6
	Innovation	5
	Information Technology	5
External Structure	Customer Satisfaction	7
	Customer Loyalty	4
	Brand	6
Business Performance	Financial Performance	3
	Sales Performance	4
	Customer Fulfillment	8

Appendix B

Structural Model Diagram



LG: Learning and Growth

IP: Internal Process

ES: External Structure

BP: Business Performance

Acknowledgements

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