
Understanding the value of process capital: a multiple case study on CRM processes

Shari S.C. Shang*

Department of Management Information Systems
National Chengchi University
No. 64, Sec. 2, ZhiNan Rd., Wenshan District
Taipei City, Taiwan, ROC
E-mail: sshang@nccu.edu.tw
*Corresponding author

Ping-der Huang

Department of Business Administration
National Chengchi University
No. 64, Sec. 2, ZhiNan Rd., Wenshan District
Taipei City, Taiwan, ROC
E-mail: pdhuang@nccu.edu.tw

Abstract: This study examined possible ways of measuring process capital and proposed proper ways of reflecting the value of process capital. Using a system model, three methods of measuring organisational processes were identified: (1) measuring the investment in processes, (2) measuring the results of processes and (3) measuring the management capability of the processes. Examining five selected cases from Taiwan's financial industry, this study applied the Resource-Based View (RBV) with the concept of dynamic capability to enhance the third method, and tested the three kinds of process capital measurements on Customer Relationship Management (CRM) processes. The findings revealed that the management capability of aligning organisational resources with the CRM processes seems to have the strongest correlation with a firm's competitiveness and the maintenance of sustained customer relationships, suggesting that it should be considered an important indicator of process capital.

Keywords: process capital; process management; Customer Relationship Management; CRM; Resource-Based View; RBV; dynamic capability.

Reference to this paper should be made as follows: Shang, S. and Huang, P. (2008) 'Understanding the value of process capital: a multiple case study on CRM processes', *Int. J. Learning and Intellectual Capital*, Vol. 5, Nos. 3/4, pp.404–416.

Biographical notes: Dr. Shari S.C. Shang is an Assistant Professor in the Department of Management Information Systems at National Chengchi University, Taiwan. She received her PhD from the University of Melbourne, Australia. She has been the Consulting Manager for IBM Worldwide Consulting Group and KPMG Consulting for several years. Her major research areas are organisational process management, enterprise systems management and demand chain management.

Ping-der Huang teaches, consults and conducts research in the areas of leadership, organisational behaviour and human resource management. He is an Associate Professor and the Director of the Advanced MBA programme at National Chengchi University in Taiwan and holds his PhD in Human Resource Development from the University of Illinois, Urbana-Champaign. He has done many publications and workshops for academia and practitioners.

1 Introduction

Process capital represents the work processes, techniques and employee programmes that augment and enhance the efficiency of manufacturing or the delivery of services for long-term value (Edvinsson and Malone, 1997). This is part of the infrastructure of a firm's intellectual capital (Bontis *et al.*, 2000; Grantham *et al.*, 1997; Johnson, 1999; Knight, 1999; Stewart, 1997; Sveiby, 1997). Measuring process capital, including the related Information Technology (IT) assets, is a critical part of a firm's strategy planning and execution.

Although process capital plays an important role in linking people in organising resources, interacting with stakeholders and delivering organisational values, limited studies have discussed the specific measurement of process capital. It has usually been hidden in the measurement of the overall organisational intellectual capital (Buren, 1999; Edvinsson and Malone, 1997) as an indicator of either the cost of administration and IT or the efficiency and quality of the production or service. The most practical indicator of process capital is probably the SOP 98-1 issued by the American Institute of Certified Public Accountants (AICPAs), which requires companies in the USA to comply with its requirements on accounting for internal-use computer software. The objective is to highlight the point that in order to gain maximum advantages, companies should manage their business software not as a series of stand-alone, single-purpose departmental applications but rather as a corporate asset the company can reuse to create new business processes as rapidly as needed (DuLaney, 2000). Nevertheless, neither a clear rationale for the measurement of process capital nor an empirical test of the validity of the indicators has been proposed.

The objectives of this study are to examine possible ways of measuring process capital and to propose proper ways of reflecting the value of process capital. Using a system model, this study identifies three methods of measuring organisational processes:

- 1 measuring the investment in processes
- 2 measuring the results of processes
- 3 measuring the management capability of the processes.

Among these, the third kind of process measurement – the management capability of processes – has been relatively unexplored in the literature. By applying the Resource-Based View (RBV) with the concept of dynamic capability, this study enhances the third method and tests the three kinds of process capital measurements on Customer Relationship Management (CRM) processes with five selected cases from the financial industry in Taiwan.

Our findings reveal that although the input and output of process capital can reflect the value of processes to a certain degree, the capability of aligning organisational resources with the CRM processes seems to have the strongest correlation with a firm's competitiveness and the maintenance of sustained customer relationships. This management capability, reflected in the alignment of the organisational resources, should be considered an important indicator of process capital.

2 The measurement of process capital

Process capital is the infrastructure type of intellectual capital, which includes knowledge, applied experience, organisational technology, customer relationships and professional skills that provide organisations with a competitive edge in the market (Edvinsson and Malone, 1997). Basically, a process transforms raw materials (*e.g.*, people, capital, information, or facilities) into an output with a specific objective, and a process in an organisation cannot be considered capital unless it has been converted into a value-generating asset.

Various studies (Bontis, 1996; Brooking, 1996; Bukh *et al.*, 2002; Buren, 1999; Dzinkowski, 2000; Edvinsson and Malone, 1997; Hildreth *et al.*, 2000; Hubert, 1996; Kaplan and Norton, 1996; Kautz and Thaysen, 2001; Roos and Roos, 1997; Stewart, 1997; Sveiby, 1997; Swan *et al.*, 1999) have tried to categorise and measure the forms of intellectual capital. One of the sensible ways to organise these measurements is by applying a system model (Von Bertalanffy, 1951) to reorganise intellectual capital indicators according to their value-generation processes (Shang *et al.*, 2004; Tsan and Chang, 2003; Tan *et al.*, 2002). Based on the system model, the elements of different types of intellectual capital can be constructed based on the sequence of input variables, process variables and output variables. The intellectual capital input becomes an output by the influence of the management capability of the organisation. Tsan and Chang (2003) applied the system model in analysing intellectual capital in Taiwan's high-technology industry. The results showed that a high investment in intellectual capital input variables could affect the process variables (the management capability) and lead to a high output.

Following the approach of the system model, the measurements of process capital can be addressed in three aspects: the input, the output and the management capability of the processes. Regarding the input of process capital, the measurement focuses on measuring the investment in process changes, which includes not only technological resources but also people and knowledge. 'Technological resources' include a machine that automates an operation, the numerical machines that monitor and control the operation, and the information systems that automate or/and integrate operations and information. 'People' means business managers' and operators' efforts in selecting, designing, implementing and adapting the changed processes and systems. 'Knowledge' refers to experts or training programmes that offer the knowledge and methodology for better processes. Edvinsson and Malone (1997) and Buren (1999) have suggested using the expenses of the administration and the cost of IT as indicators of the input of process capital.

Regarding the output set of process capital, the measurement focuses on measuring the long-term results of business performance related to, but sometimes not directly affected by, the investment in process changes. These results include efficiency (*i.e.*, cost, speed and productivity), effectiveness (*i.e.*, customer satisfaction, revenue

growth or other perceptual indexes), flexibility (*i.e.*, new products, new markets, new organisational structures) and the strategic achievement of competitive advantages. However, many contingency factors may contribute to these results. Edvinsson and Malone (1997) and Buren (1999) have also suggested using IT performance, operational efficiency and quality to reflect the value of process capital.

The relatively unexplored set of process capital measurements is the management capability relating to the selection, design, implementation and adaptation of new processes. Process capital tends to consist of the tangible resources and intangible elements of a tacit knowledge set that includes trade secrets and process technologies (Johnson, 1999). It involves interactions between technical and social factors (Markus, 1983). According to the RBV (Grant, 1991; Peteraf, 1993; Barney, 1991; Wernerfelt, 1984), understanding the capability of creating and sustaining organisational competitive advantage with the processes managed can provide a basis for analysing the complicated contents of processes. The RBV highlights the importance of the scarcity of resources, including the processes, information, people, structure and organisational culture, for sustained competitiveness. The RBV was further enhanced with the addition of the dynamic ability to continuously integrate and renew the resources in responding to changing business environments (Teece *et al.*, 1997; Eisenhardt and Martin, 2000). In the case of the management capability of process capital, one can refer to it as the ability to align organisational resources with the invested processes for sustained competitiveness.

As summarised in Table 1, the three kinds of process capital measurements have different management assumptions. The input view of process capital assumes that the amount of process investment can predict future results. The output view of process capital assumes that the results of the past may predict the results of the future. Finally, the capability view assumes that the current capability may predict the success of the future.

Table 1 Contrasting the three measures of process capital

<i>Types</i>	<i>Measures</i>	<i>Measured</i>	<i>Predicts</i>	<i>Assumption</i>
Input	Resources invested in process changes	Current efforts	Current/ Future results	The amount of the investment of resources in process change can predict the future value of the processes
Output	The results of the changed processes	Past efforts	Current/ Future results	The current performance of the processes can predict the future value of the processes
Management	Capability of managing the process changes	Past efforts	Current/ Future results	The current capability of process management can predict the future value of the processes

The objective of this study is to understand the measurement of process capital. In order to gain organisational insights and compare the predictability of the different kinds of process capital measurements, this study uses the method of case studies to investigate the CRM processes in five financial companies in Taiwan.

A CRM process is a process of combining people, knowledge and technology that seeks to provide an understanding of a company's customers and to support a business strategy to build long-term, profitable relationships with customers (Chen and Popovich, 2003; Ling and Yen, 2001). Having invested in CRM technologies and systems, companies expect that the processes can produce promising long-term value in customer relationships. However, many have reported the failure of the investment in CRM systems due to technology and organisational issues. The CRM processes seem to be a critical form of intellectual capital that requires proper investment in technology and a dynamic capability to manage the complex context. By studying the CRM process on multiple cases, this study expects to gain insight into the management of this particular process. The framework for data collection with respect to the inputs, the output and the management capabilities of CRM processes is identified.

3 Customer relationship management processes

CRM is a continuous effort that requires redesigning core business processes, starting from the customer perspective and involving customer feedback (Chen and Popovich, 2003; Piccoli *et al.*, 2003). The effectiveness of CRM processes depends upon the close link between front-line activities and internal operations such as product development, strategic planning and financial processes. In addition to increased efficiencies in sales and marketing, service functions need to be fundamentally changed with regard to their competencies relative to the CRM strategy (Tan *et al.*, 2002). The goal is to make it easy for the front line to carry the voice of the customer deep into the organisation and to use this information to guide the processes (Kalakota and Robinson, 2000).

3.1 Investment in customer relationship management processes

Based on the literature and on field studies (Chan, 2005; Foss *et al.*, 2002), Chen and Shang (2005) proposed an IT infrastructure for a CRM system that can help to explain the evolutionary path of CRM investment from both the IT and organisational perspectives. The infrastructure contains three major parts: the communicational CRM, the execution CRM and the intelligence CRM.

Most CRM implementation started with simple call centre systems handling inbound customer phone calls. Communicational CRM is the front-end application that supports customer-facing processes. Execution CRM supports typical customer management activities (Starkey *et al.*, 2001). Customer activity management systems are applications such as Enterprise Resource Planning (ERP) and Supply Chain Management (SCM) systems that support these customer-facing core business processes. The foundation of intelligent CRM requires the development of a customer-centric data warehouse containing subject area data from orders, problem tickets, *etc.* In addition to the investment in technology, other investments in CRM processes can include consultancy, educational programmes, and organisational change and learning efforts.

3.2 *The results of customer relationship management processes*

Several studies have proposed ways of measuring the value of CRM. Chen and Ching (2004) proposed that the performance of CRM could be measured by organisational benefits (profit increases, reduced costs, new opportunities) and customer benefits (social benefits, psychological benefits, economic benefits, customisation benefits). In reality, managing customer relationships effectively and efficiently boosts customer satisfaction and retention rates (Jackson, 1994; Levine, 1993; Reichheld, 1996a–b). The rewards of executing an effective CRM programme are largely self-evident: increased customer value, higher customer retention, increased customer recruitment and, ultimately, higher profitability (Ling and Yen, 2001). Companies that successfully implement CRM will reap the rewards in customer loyalty and long-term profitability.

3.3 *The management of customer relationship management processes*

To realise the best of its CRM, a firm must make enterprise-wide, customer-driven, technology-integrated and cross-functional efforts (Chen and Popovich, 2003). By consolidating the literature findings verified by the industrial experts, four types of aligned resources are found to be critical for businesses to obtain lasting value from complicated CRM processes: information, structure, culture and capability.

The effectiveness of CRM depends upon the close link between front-line activities and internal operations. The goal is to make it easy for the front line to carry the voice of the customer as deeply into the organisation as possible and to use it to guide processes (Kalakota and Robinson, 2000). Therefore, the effective management of information is critical for product tailoring, service innovation, consolidated views of customers and the calculation of customer lifetime value (Peppard, 2000). On the analytical side, a confluence of multiple disciplines, including data warehousing, Online Analytical Processing (OLAP), data mining and other complementary technologies, have enabled marketers to sift through mountains of data to extract invaluable information and knowledge about their customer base. Integrating these technologies with operational front-end and back-end systems provides the necessary seamless collaboration and the IT challenge that comes along with it (Ling and Yen, 2001). Therefore, the integration of CRM technology elements places emphasis on how to make information flow fluently between different CRM technology elements.

Organisational transformation is necessary for the organisation to take full advantage of the CRM capabilities provided. Changing the technology without transforming the organisation will have less than optimal impact (Goodhue *et al.*, 2002). CRM requires companies to adopt customer-centric philosophies, to change their structures and processes, and to alter their corporate cultures accordingly (Rigby *et al.*, 2002). In addition, aligning organisational capabilities in order to better deliver what the firm's customers may perceive as heightened value is a fundamental step in implementing CRM (Tan *et al.*, 2002). As summarised in Table 2, to remain competitive and maximise profits, companies must align processes with their technology, structure, culture and skills to build, retain and deepen the lifetime value of customer relationships (Kalakota and Robinson, 2000).

Table 2 Aligned organisational resources of CRM

<i>Aligned resources</i>	<i>Description</i>
Information	Integrated technology across communicational, execution and intelligence CRM systems Integrated information across front-end and back offices
Structure	Functions Accountability, job description and employee roles Performance measures and job evaluations Incentive reward and compensation systems
Culture	Market-orientated culture 1 Team level <ul style="list-style-type: none"> • Market intelligence generation • Market intelligence dissemination • Market intelligence responsiveness 2 Individual level <ul style="list-style-type: none"> • Employee empowerment
Capability	Learning and market-orientation capabilities Integration capabilities Analytical capabilities Operational capabilities Direction capabilities

4 Research methods

The case study method was used to investigate the CRM processes in five financial companies in Taiwan. The reason why this study chose financial holding companies as the subject was that the financial services industry has taken an early lead in CRM implementation because transactions are essentially IT-based, and so these firms already hold a wealth of information about individual customers (Codington and Wilson, 1994). Financial holding companies, by their nature, tend to have a wide range of customers and products. Customer relationships are important to business success in this competitive market, and the use of CRM greatly affects market performance. In Taiwan, the Merger Law of Financial Institutions and the Financial Holding Company Act permit banks, insurance companies, securities firms and other financial institutions to affiliate under a common ownership and to offer their customers a more complete range of financial services (Kuo and Lu, 2005). At the moment, there are 14 financial holding companies in Taiwan, and CRM techniques have been widely adopted by these companies to provide services and build differentiation in the market. Based on the information provided by the Taiwan Financial Supervisory Commission, ten out of the 14 companies are involved in the consumer banking business. In order to maximise the diversity and increase the representative power of the results, this study carefully selected five companies out of the ten financial holding companies. The five had their rankings evenly distributed from

the top to the bottom in the industry. The ranking was based on credit card volume, which is one of the key indicators of market performance. The descriptions of the statistics of CRM implementation for the five companies are listed in Table 3.

Table 3 Description of cases studied

<i>Company</i>	<i>CRM processes</i>	<i>Years of CRM use</i>	<i>Performance ranking</i>
A	Customer service	7	10
B	Customer service	15	8
C	Customer service, marketing and sales	5	5
D	Customer service, marketing and sales	6	3
E	Customer service, marketing and sales	15	1

Multiple interviewees from all five cases were contacted for data collection. The major interviewees were users and managers of CRM systems who understood the operation and effects of CRM. Three to five business managers were interviewed for each case, and every interview took two hours. In addition to the structured questions, open-ended questions requiring elaboration on the alignment of organisational resources were also asked.

In addition, in order to obtain an objective comparison of the value of the process capital among the multiple cases, two experts in this industry were interviewed. The experts were professional investors from the financial industry who had accumulated knowledge of the performance and management structure of these companies for more than 15 years.

5 Results

The results of the five case studies are summarised in Table 4. The investment in processes and IT does not necessarily have any link with the coming year's performance. Although the system processes invested in were similar in the five cases (the call centre, the data warehouse, the supported ERP systems and the database), the companies showed different market performance. For instance, Finance C and D both invested in advanced technology in data mining two years ago, while Finance E has an older version of a data mining tool for data analysis, yet Finance E remains ahead over three years while Finance C and D are still building people skills in using the tool.

It is obvious that the market performance of the previous year cannot predict the performance of the following year. The performance of Finance A, B, C and D fluctuated in ranking over the past three years. No significant pattern can be found in the performance between the prior years and the current year.

Finally, the cases that experienced higher customer value in both profitability and retention rate have a relatively higher technology integration as well as organisational alignment (*i.e.*, Finance D and E), while the cases with low integration among information systems and low organisational alignment tend to have a low customer value (*i.e.*, Finance A and B).

Table 4 Study results

<i>Cases</i>	<i>Process/IT investment</i>	<i>Tech. integration</i>	<i>Org. alignment</i>	<i>Customer growth 2005</i>	<i>New prod. 2005</i>	<i>Industry ranking 03/04/05</i>
Finance A	Growing	L	L	L	L	8/10/10
Finance B	Growing	L	L	L	L	7/9/8
Finance C	Largely increased	M	M	M	M	6/6/5
Finance D	Largely increased	M-H	M	H	H	4/2/3
Finance E	Stable budget	H	H	H	H	1/1/1

Among the five cases, it is worth noting that the organisations of Finance A and B seem to be bureaucratic in both structure and processes. The administration efficiency was low because one simple product decision would take a very long time to process as compared to other, younger competitors such as Finance C and D. However, the CRM processes are rather functional, and no cross-functional work is encouraged. Call centres are owned by different product lines and the marketing and sales are run by different branches.

For Finance C and D, their managers have been deeply involved in reorganising the structure, managing conflicts and designing products. A cross-departmental committee including product development, front-line sales, production and customer service has been formed, and regular meetings are conducted. Top managers take the lead in mediating among different product lines for overlapped customers and channels.

Finance E has been the top performer for three consecutive years. The company installed its customer call centre 15 years ago and conducted Business Process Reengineering (BPR) five years later. There were three major changes in the BPR project: customer data integration, customer-focused process redesign and structure reorganisation. At that time, there was no such term as 'customer relationship management'. However, the goal of the project was to transform the organisation from product centric to customer centric, with the aim of instituting flexible CRM. Customer information files that were originally spread over different product records were integrated and consolidated by a single customer account. Business processes were redesigned around customer contact points, and functional processes were broken down into modular customer service processes and realigned with different customer projects. Finally, the organisational structure was flattened with minimum levels of communication. The aim was to deploy customer insights in the operational CRM environment through marketing, sales and service application in order to enhance the effectiveness of customer communications. Data were collected on marketing campaigns, channels, treatments and customer responses in order to reveal the effectiveness of CRM activity. The data were then analysed to enable decision-makers to understand how customers react to different forms and content of interaction. The goal was to make fully visible all campaign and channel performance and to exploit this knowledge to optimise the effectiveness of every customer contact (Hirschowitz, 2001).

As revealed in the case of Finance E, the capability of building an organisation with the resources aligned with the processes invested in seems to be a critical factor to the success of a CRM project. According to data collected from Finance E, this capability has been maintained and enhanced throughout the years with policy and technology changes.

Ever since Finance E implemented its CRM systems and a BPR project ten years ago, the company's customer base has started to grow and their ranking to move ahead in the market. In short, the capability of aligning resources seems to be a very important factor for CRM success.

6 Discussion

This study compares three kinds of measurements of process capital. The results reveal that the input variances of process capital have a low correlation with the firm's performance. Although the assumption holds that the investment in processes can contribute directly to the firm's performance, it must assume rational behaviour on the part of the actors (Weill, 1990). However, the design of the interaction between the technology and the organisation's resources is an important variable in process investment. In his study of the payoff of the IT investments of 133 valve firms in the USA, Weill (1990) found that although investment in the transactional type of IT can reduce the labour cost of nonproduction processes, investment in IT has no association with strategic results. Researchers have recognised that mediating factors such as power, politics, business design and people skills can affect the implementation of the process changes. We are only sure that investments in operational processes can be expected to have a direct, positive effect on productivity. However, investments in technology-enabled process changes are less likely to have a direct effect on competitive results.

While the results of the process change may not predict future performance as the end result of the previous effort, it is an indication of how many unstable contingency variables such as branding, business alliances or market changes may affect the results in the future. In addition, there is no evidence that past failure can predict future loss, but it is unrealistic for a company to continue the unsuccessful processes. Normally, the firm would endeavour to revise whatever caused the problem and to invest in projects to turn it around.

Based on the five case studies, the results show that the capability of aligning organisational resources with the changed processes seems to have a stronger correlation with the strategic results of a firm. Our findings agree with the findings of Weill (1990) that investments for strategic purposes do not have a direct link with competitive results due to the moderating effect of conversion effectiveness (Weill and Olson, 1989). Conversion effectiveness is the firm's effectiveness in converting investment in IT into useful outputs. Firms with high conversion effectiveness were able to achieve more positive results from the investment in IT. This management capability can involve various types of resources depending upon the characteristics of the processes. For a service-oriented company, the building of customer-centred infrastructure is a necessary capability; but for a control-type firm, establishing discipline within the firm would be necessary in order for the processes to run smoothly. While IT has become a commodity (Carr, 2004) that could be owned by everyone, the management capability, on the other hand, is something unique and difficult to imitate. This capability would then be the differentiator for the firm to win the combat in the marketplace.

Process capital has been included as part of organisational intellectual capital because different categories of intellectual capital must be in alignment to complement one another (Andriessen, 2004). A corporation's value does not arise directly from any of its intellectual capital categories, but only from the interaction between these categories. An investment in organisational processes is an investment in intellectual capital, but only when all of the resources are in alignment can lasting value be developed.

7 Conclusion

A process in an organisation cannot be considered capital unless it delivers lasting value to the organisation. Through literature exploration and CRM case analysis, this study proposes that only when a process is running with aligned resources can the firm realise long-term value from the investment. In order for this capability to last longer, this aligned status must be maintained, modified and enhanced according to the needs of the changing environment.

The management of business processes takes place in an environment full of business and technology changes. Therefore, the capability of identifying the required resources and selecting a suitable strategy to reduce the resource gap in reaction to the complicated and changing environment has become the most critical element in capitalising the investment in process management.

References

- Andriessen, D. (2004) *Making Sense of Intellectual Capital: Designing a Method for the Valuation of Intangibles*, New York: Elsevier.
- Barney, J. (1991) 'Firm resources and sustained competitive advantage', *Journal of Management*, Vol. 17, No. 1, pp.99–120.
- Bontis, N. (1996) 'There's a price on your head: managing intellectual capital strategically', *Business Quarterly*, Vol. 60, No. 4, pp.40–46.
- Bontis, N., Keow, W.C.C. and Richardson, S. (2000) 'Intellectual capital and business performance in Malaysian industries', *Journal of Intellectual Capital*, Vol. 1, No. 1, p.85.
- Brooking, A. (1996) *Intellectual Capital*, London: International Thomson Business Press.
- Bukh, P., Johansen, M. and Mouritsen, J. (2002) 'Multiple integrated performance management systems: IC and BSC in a software company', *Singapore Management Review*, Vol. 24, No. 3, pp.21–33.
- Buren, M.E.V. (1999) 'A yardstick for knowledge management', *Training & Development*, Vol. 53, No. 5, pp.71–77.
- Carr, N. (2004) *Does IT Matter? Information Technology and the Corrosion of Competitive Advantage*, Harvard Business School Press.
- Chan, J. (2005) 'Toward a unified view of customer relationship management', *Journal of American Academy of Business*, Vol. 6, No. 1, pp.32–38.
- Chen, I.J. and Popovich, K. (2003) 'Understanding Customer Relationship Management (CRM): people, process and technology', *Business Process Management Journal*, Vol. 9, No. 5, pp.672–688.
- Chen, J-S. and Ching, R.K.H. (2004) 'An empirical study of the relationship of IT intensity and organizational absorptive capacity on CRM performance', *Journal of Global Information Management*, Vol. 12, No. 1, pp.1–17.

- Chen, M. and Shang, S. (2005) 'Implementing an enterprise-wide CRM infrastructure', *Proceedings of the Fourth Workshop on e-Business (WEB 2005) – A Pre-ICIS Workshop AIS*, Las Vegas, USA, 10 December.
- Codington, S. and Wilson, T.D. (1994) 'Information system strategies in the UK insurance industry', *International Journal of Information Management*, Vol. 14, No. 3, pp.188–203.
- DuLaney, W. (2000) 'Capitalizing software and creating business value', *Journal of Accountancy*, July, <http://www.aicpa.org/pubs/jofa/jul2000/dulaney.htm>.
- Dzinkowski, R. (2000) 'The measurement and management of intellectual capital: an introduction', *Management Accounting*, Vol. 78, No. 2, pp.32–36.
- Edvinsson, L. and Malone, M.S. (1997) *Intellectual Capital: Realizing Your Company's True Values by Finding Its Hidden Brainpower*, HarperCollins Publishers.
- Eisenhardt, K. and Martin, J. (2000) 'Dynamic capabilities: what are they?', *Strategic Management Journal*, Vol. 21, Nos. 10–11, pp.1105–1121.
- Foss, B., Devonport, C. and McDaid, P. (2002) 'Achieving ROI from e-business systems in financial services', in B. Foss and M. Stone (Eds.) *CRM in Financial Services: A Practical Guide to Making Customer Relationship Management Work*, Chap. 18, London: Kogan Page Ltd.
- Goodhue, D.L., Wixom, B.H. and Watson, H.J. (2002) 'Realizing business benefits through CRM: hitting the right target in the right way', *MISQ Executive*, Vol. 1, No. 2, pp.79–94.
- Grant, R.M. (1991) 'The resource-based theory of competitive advantage: implications for strategy formulation', *California Management Review*, Vol. 33, No. 3, pp.114–135.
- Grantham, C.E., Nichols, L.D. and Schonberger, M. (1997) 'A framework for the management of intellectual capital in the health care industry', *Journal of Health Care Finance*, Vol. 23, No. 3, pp.1–19.
- Hildreth, P., Kimble, C. and Wright, P. (2000) 'Communities of practice in the distributed international environment', *Journal of Knowledge Management*, Vol. 4, No. 1, pp.27–37.
- Hirschowitz, A. (2001) 'Closing the CRM loop', *Journal of Targeting, Measurement and Analysis for Marketing*, Vol. 10, No. 2, pp.168–178.
- Hubert, S-O. (1996) 'Tacit knowledge: the key to the strategic alignment of intellectual capital', *Strategy & Leadership*, Vol. 24, No. 2, pp.10–13.
- Jackson, D., Jr. (1994) 'Relationship selling: the personalization of relationship marketing', *Asia-Australia Marketing Journal*, Vol. 2, No. 1, pp.45–54.
- Johnson, W.H.A. (1999) 'An integrative taxonomy of intellectual capital: measuring the stock and flow of intellectual capital components in the firm', *Int. J. Technology Management*, Vol. 18, Nos. 5–8, pp.562–575.
- Kalakota, R. and Robinson, M. (2000) *E-business: Roadmap for Success*, Massachusetts: Addison-Wesley.
- Kaplan, R. and Norton, D. (1996) *The Balanced Scorecard: Translating Strategy into Actions*, Boston, MA: Harvard Business School Press.
- Kautz, K. and Thaysen, K. (2001) 'Knowledge, learning and IT support in a small software company', *Journal of Knowledge Management*, Vol. 5, No. 4, p.349.
- Knight, D.J. (1999) 'Performance measure for increasing intellectual capital', *Strategy & Leadership*, Vol. 27, No. 2, pp.22–27.
- Kuo, C. and Lu, S.L. (2005) 'Taiwan's financial holding companies: an empirical investigation based on Markov regime-switching model', *Applied Economics*, Vol. 37, pp.593–605.
- Levine, J. (1993) 'Relationship marketing', *Forbes*, Vol. 152, No. 14, pp.232–233.
- Ling, R. and Yen, D.C. (2001) 'Customer relationship management: an analysis framework and implementation strategies', *The Journal of Computer Information Systems*, Vol. 41, No. 3, pp.82–97.

- Markus, M.L. (1983) 'Power, politics, and MIS implementation', *Communications of the ACM*, Vol. 26, No. 6, pp.430–444.
- Peppard, J. (2000) 'Customer Relationship Management (CRM) in financial services', *European Management Journal*, Vol. 18, No. 3, pp.312–327.
- Peteraf, M.A. (1993) 'The cornerstones of competitive advantage: a resource-based view', *Strategic Management Journal*, Vol. 14, No. 3, pp.179–191.
- Piccoli, G., O'Connor, P., Capaccioli, C. and Alvarez, R. (2003) 'Customer relationship management – a driver for change in the structure of the U.S. lodging industry', *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 44, No. 4, pp.61–73.
- Reichheld, F.F. (1996a) 'Learning from customer defections', *Harvard Business Review*, Vol. 74, No. 2, pp.56–67.
- Reichheld, F.F. (1996b) *The Loyalty Effect*, Boston, MA: Harvard Business School Press.
- Rigby, D.K., Reichheld, F.F. and Scheffer, P. (2002) 'Avoid the four perils of CRM', *Harvard Business Review*, Vol. 80, No. 2, pp.101–109.
- Roos, G. and Roos, J. (1997) 'Measuring your company's intellectual performance', *Long Range Planning*, Vol. 30, No. 3, pp.413–426.
- Shang, S., Lin, J. and Lin, Y. (2004) 'A process view of the impact of information technology on the management of intellectual capital in the banking industry', *Proceedings of the 2004 TICRC International Conference*, Taipei, Taiwan, 11–12 October.
- Starkey, M., Woodcock, N. and Stone, M. (2001) 'Assessing the quality of customer management in financial services', in SCN Education B.V., Friedr. Vieweg and Sohn Verlagsgesellschaft mbH (Eds.) *Customer Relationship Management*, pp.31–56.
- Stewart, T.A. (1997) *Intellectual Capital: The New Wealth of Organizations*, Currency Doubleday.
- Sveiby, K.E. (1997) *The New Organizational Wealth: Managing and Measuring Knowledge-Based Assets*, San Francisco: Berrett-Koehler Publishers.
- Swan, J., Newell, S., Scarbrough, H. and Hislop, D. (1999) 'Knowledge management and innovation: networks and networking', *Journal of Knowledge Management*, Vol. 3, No. 4, pp.262–275.
- Tan, X., Yen, D.C. and Fang, X. (2002) 'Internet integrated customer relationship management: a key success factor for companies in the e-commerce arena', *The Journal of Computer Information Systems*, Vol. 42, No. 3, pp.77–86.
- Teece, D.J., Pisano, G. and Shuen, A. (1997) 'Dynamic capabilities and strategic management', *Strategic Management Journal*, Vol. 18, No. 7, pp.509–533.
- Tsan, W.N. and Chang, C.C. (2003) 'Industrial intellectual capital measurement: the case of Taiwan information technology industry', *International Research Foundation Development Conference on Digital Divide, Global Development and the Information Society, the United Nations World Summit on the Information Society*, 8–9 December.
- Von Bertalanffy, L. (1951) 'General system theory: a new approach to unity of science', *Human Biology*, Vol. 23, pp.303–361.
- Weill, P. (1990) *Do Computers Pay Off?*, International Center for Information Technologies, Washington, DC, USA.
- Weill, P. and Olson, M.H. (1989) 'Managing investment in information technology: mini case examples and implications', *Management Information Systems Quarterly*, March, Vol. 13, No. 1, pp.3–17.
- Wernerfelt, B. (1984) 'A resource-based view of the firm', *Strategic Management Journal*, Vol. 5, No. 2, pp.171–180.