



Electronic Commerce in Small Businesses in New Zealand: A Focus Group Approach

Nabeel A. Y. Al-Qirim

School of Computer and Information Sciences, Faculty of Business, Auckland University of Technology, Private Bag 92006 Auckland 1020, New Zealand, Email: nabeel.alqirim@aut.ac.nz

ABSTRACT

This focus group-based research lists a set of factors influencing electronic commerce (EC) adoption in small to medium-sized enterprises (SMEs) in New Zealand and attempts to explain the impact and the importance of those factors on EC adoption. The results indicate that EC adoption and its use in business in SMEs is not extensive. Two main issues pertaining to EC adoption emerge. Firstly, SMEs will not risk investing their scant resources on perceived "high-risky" EC projects. For simpler EC technologies, cost and compatibility are not an issue in SME e-Commerce adoption. On the other hand, the drivers for EC adoption did not appear to be highly significant making the attitude amongst the participants toward EC uncritical. Secondly, it is at the more advanced levels of EC initiatives (e.g., interactive Web sites) that the participants started to perceive the importance of EC to their businesses and the significance of the different factors on their adoption decision of EC.

INTRODUCTION & THEORETICAL FRAMEWORK

In the past few decades, researchers and professionals started to highlight the contribution of small to medium-sized enterprises (SMEs) in maintaining healthy and dynamic economies in different countries in the world. It was believed that the recent emergence of electronic commerce (EC) could create new production processes, new forms of business organisation, new scope for consumers, and new market opportunities. This is of significant importance to SMEs, who usually possess few employees, limited resources and time, engaged in daily surviving activities, limited opportunities and make short-term plans. However, SMEs have always been accused of not appraising IS strategically in their business activities (Blili & Raymond, 1993; Cragg & King, 1992, 1993). Recent EC research in SMEs confirmed the same and pointed to the laggardness of the SMEs in adopting or in using EC strategically in the different business activities (Abell & Lim 1996; Abell & Black, 1997; Adam & Deans, 2000; MOED, 2000a,b; Poon, 2000; Poon & Swatman, 1995, 1997, 1998, 1999a, 1999b; PWHC, 1999). Thus, understanding the different reasons, which make the SMEs adopt EC in business, is important in order to justify such laggardness in IS in general and in EC specifically. Therefore, this research was interested in answering the following research question: What are the factors that would influence electronic commerce technologies adoption in SMEs in New Zealand and how do they influence adoption?

Following a review of the innovation adoption research in small businesses (Premkumar & Roberts, 1999; Thong, 1999; Thong & Yap, 1995, 1996), the following ten factors emerged as potential determinants of EC adoption in small to medium-sized enterprises (SMEs): (1) Technological factors: relative advantage, cost, and compatibility, (2) Organisational factors: size and information intensity, (3) Manager-owner factors (CEO): manager's innovativeness and manager's IS/EC knowledge, and (4) Environmental factors: competition, external support and supplier/buyer pressure. As a measure, the size factor is more appropriate to quantitative studies than to qualitative ones, as is the case

in this research. Further, extending or adapting the remaining nine factors to EC research is not a straightforward process, because EC introduces unique features. Past studies found that facilitation factors vary according to the innovation type (Swanson, 1994). Therefore, the nine factors were revisited by EC research (Abell & Lim 1996; Abell & Black, 1997; Adam & Deans, 2000; MOED, 2000a,b; Poon, 2000; Poon & Swatman, 1995, 1997, 1998, 1999a, 1999b; PWHC, 1999; Teo & Tan 1998) in order to justify the face validity of those factors to EC adoption research. Accordingly the researcher maintained the depicted determinants above but replaced the CEO's IS/EC knowledge with the manager's involvement and the information intensity with the information-intensity of products and services. The above EC researchers to be more significant to the EC phenomenon than to IS in SMEs suggested these changes. To extend an understanding of these determinants, it was decided to evaluate each in a focus group context.

RESEARCH METHODOLOGY

Focus group origins lay in sociology and market research (Blackburn & Stokes, 2000; Morgan, 1998). It is a process (lead by a discussion leader "moderator") of obtaining possible ideas or solutions to a problem from a group of participants (Aaker et al., 1998; Blackburn & Stokes, 2000; Bloor et al., 2001; Stewart & Shamdasani, 1990). It is an attractive medium for public participation in the research process. They are time-limited; require no technical skills of the group members; and are not costly to implement (depending on the research design) (Blackburn & Stokes, 2000; Bloor et al., 2001). Focus group is a flexible research method (Morgan, 1998) and researchers have suggested its use as one viable tool in IS research (Clarke, 1999a,b; 2001).

Focus groups play a major part as an ancillary method, alongside and complementing other methods including using the focus group as a method of communicating findings to research subjects for the objective of creating further discussions and hence, discovering new insights (Bloor et al., 2001). The literature points to focus group success as a confirmatory research tool as well (Blackburn & Stokes, 2000; Bloor et al., 2001; Stewart & Shamdasani, 1990).

A group of 6 to 10 or 12 (Blackburn & Stokes, 2000; Clarke, 1999b; Stewart & Shamdasani, 1990) or even up to 14 (Bloor et al., 2001) have become customary in focus group research. However, Blackburn and Stokes (2000) found that groups over 8 are less manageable. Researchers have favoured group of strangers, as they are more likely to express taken-for-granted opinions and experiences (Bloor et al., 2001; Stewart & Shamdasani, 1990).

Small enterprises are defined as those employing 0-5 employees (often called micro-businesses) and medium-sized enterprises as those employing 6-19 employees (MOED, 2000a). However, selecting a range of 100 employees and fewer was found adequate for comparison purposes with SMEs in Europe and the US (MOED, 2000a). From a sampling frame of 324 SMEs selected randomly from the North Shore Telephone Business Directory, twenty-six SMEs showed interest in joining the

Table 1. Business details of the participating SMEs.

Business type	Participants					
	A	B	C	D	E	F
	Manufacturing (Greenhouse automation tools)	Importer and manufacturer of industrial Diamond tools.	Wholesale/Retail (Fire arms and ammunitions)	Manufacturer, Wholesale/ Online retail (Tourism videos, CDs, DVDs about New Zealand)	Construction	IT & Communications Services (Develop integrated electronic security systems)
Title of participant	Manager	Director	Managing director	Managing director	Director	Chief technology officer
CEO is owner or one of the owners	Yes	Yes	Yes	Yes	Yes	Yes
Number of employees	5	4	2	2	7	20

focus group session. Accordingly, 16 SMEs agreed to attend the focus group and eventually ten confirmed their attendance. However, only six attended the focus group session (Table 1). The different SMEs were complete strangers. The researcher selected a senior lecturer in the School of Education and Social Sciences, Auckland University of Technology, for his capability in running group discussions. The session took place at one of the conference facilities at Auckland University of Technology on Wednesday March 13, 2002. The meeting lasted from 5:30 pm to 10:20 pm. There were several breaks and the session started with snacks so that the participants could sustain the long focus group session. The session was video recorded and the researcher took notes.

As the bulk of this research is based on well-developed set of determinants extended from the innovation theories, holistic content analysis was not necessary and hence, adopting ethnographic summaries, endorsed by quotes from the different participants in the focus group session (Morgan, 1998).

ANALYSIS AND RESULTS

In reviewing the participants’ responses concerning the adopted EC technologies, Table 2 summarises their responses along with the reported advantages and disadvantages. It was observed from Table 2 that their adoption of EC was limited to email (internal and external) and to Web sites only.

The different issues emerging from the moderator’s discussion with the six participants around the nine factors in the research framework are explained next.

Low perceived benefits

The SMEs described their Web sites initiatives as simple and named such Web sites as “passive” initiatives. The SMEs named the advanced

Table 2. Adopted EC technologies by SMEs in the focus group.

	Adopting companies	Advantages/Applications	Reported disadvantages/Non-adopter’s views
Internal email	A, E, F	Convenient, efficient, transfer of documents, and communication across remote offices.	No network, few employees, all on one site and no need for it, can shout, and impersonal.
External email	All	Convenient, efficient, formal tool, cheaper than fax/tel., record management of correspondence, legitimate use of informal language, open 24 hours 7 days a week.	Viruses, spam, employee’s misuse.
Web page (simple)	All	Becoming the yellow pages on the Internet, image enhancement, and simple company brochure.	
Web page (more than Internet presence)	A, D, E	Nature of the business facilitates having detailed-content Web site, market outreach to international markets, and product catalogues.	Lazy, large product range to put into Web site, steep learning curve, needs continuous update, expensive to retain (marketing it through traditional media and search engine).
Internet banking	A, D, E	Convenience, fast and efficient payments of credit/debit, 24X7, monitoring financial and transactions movements conducted by the accountant, and providing up to date financial information.	Lazy to do it, security threats, lack of signature (needs two managers to sign the checks).
Credit card payment	D	Facilitates Internet sales in comparison with the traditional paper system.	Perceived security threats, Misusing credit card details by merchants either nationally or internationally. However, credit card companies are responsible for any fraudulent activities over the Internet.

EC initiatives as “interactive EC” using full products/services online, receiving and fulfilling queries/orders online, interacting online with their buyers, and collecting payments online. Some of the participants highlighted that their Web sites were pushed to a further level of sophistication and/or will undergo ongoing development and enhancements (mostly technological). However, participant E indicated that it is the nature of the business that dictates the sophistication of the Web site. Participant D, for example, developed and sold online videos, CDs and DVDs that included promotional information about tourism in New Zealand. These were highly attractive to international tourists interested in visiting New Zealand. Therefore the company provided an online transaction processing and payment tool on their Web site to allow international customers shop and buy online.

The participants emphasised the need to make a clear distinction between low and high levels of EC levels. Most of the participants highlighted that they used EC minimally and hence, issues pertaining to strategic and interactive EC initiatives such as providing full details about their products and services online, buying and configuring state of the art EC infrastructure, and collecting payments online were not adopted. However, most of the participants retained a solid belief that all the benefits as well as the risks were in the envisaged high levels of EC. Participant F commented, “...generally if you are adopting a technology, it is definitely an advantage to the business. However, being a leader in adopting new and emerging technologies is highly risky and possibly a disadvantageous to the business due to financial commitments and risks... payback, technology risk... choosing the wrong platform or technology. Adopting email and Web page is not risky and everybody is using them in business”.

The participants confirmed that unless EC proves feasible and financially justifiable they would not take the risk of adopting advanced EC initiatives. The participants emphasised that progressing to more advanced EC projects and initiatives require huge investment, time and effort, and above all has high-risk elements (small New Zealand market scope in comparison with the U.S; and international markets and opportunities are vague to them). However, most of the participants saw the advanced EC initiatives as a grey area and stressed the need for help from experts in the field (business analysts, consultants) to bridge the existing gap between their lack of detailed knowledge about EC and their businesses and how to exploit EC opportunities to the benefit of their businesses.

The participants indicated that it would be quite difficult to quantify EC advantages. The participants were not witnessing real tangible benefits except participants A and D. All the participants emphasised that EC to them was more of a competitive necessity. Participant F commented, “I think of the moment we all adopt email and Web pages, that’s why such initiatives are not that expensive up to this point....you can choose not to open your email or Web page (the business does not rely on EC). I am talking about the next point such as adopting interactive Web sites where the big decision will take place.”

Only participant D was selling and collecting money online and realising direct tangible benefits. Participant D challenged the other participants by criticising their continuous use of impediments such as time and cost. Participant C responded, “I am only saying they are a factor (among other factors), I am in the business of selling what I sell.... I am not in the business of ... eBusiness as such. I can go on quite nicely as I am in the moment without going any deeper....”. Participant D commented, “It is interesting some of the things we discussed so far ..I am just hearing what are two negatives coming through...and it is on the basis of cost or time component and maybe incompatibility, reservation or nervousness about that technology and how it is usedthe way I always worked is that ignorance can be a wonderful thing because you can find people to do it for you provided you can justify it otherwise, I think you can get sucked into yourself”. What the SMEs really needed was to understand how to use and drive technology to the benefit of their businesses.

Information intensity and industry/product – specific

When the participants were asked about the impact of the information part of their products on their adoption decision of EC and

whether their products were suitable to be offered on the Internet, the participants, at the outset, replied favourably and positively. For example, participant A indicated, "... most of our sales are done through distributors, so I think going to a shopping trolley type of situation is not appropriate. On the other hand, we have small number of products, which means we can handle the whole range on our Web site very easily, our products are high tech. (green house automation products) and because they are high tech., this makes the Internet suitable medium for our products. However, our products need a lot of support, which we can provide through the Internet quite cheaply". Participant C sold firearms through their retail outlet and through a network of dealers nationwide. Like participant B they perceived that it would be quite possible to include a catalogue on their Web site "I will say that if I wanted to sell directly over the internet, all our products are suitable to sell" but they were not doing it because the owner raised issues concerning firearms licensing over the Internet but indicated that the other firearms retailers were already selling online. He admitted of being a bit lazy in pursuing EC opportunities.

However, each company has its own product-specifics and this in turn points our attention to the earlier comment above about industry-specific issues. Thus, some industries were more appropriate to EC than others, regardless, whether they were working in "high tech" industry or not.

The cost factor

Achieving lower levels of EC capabilities such as establishing a Web page or an online catalogue was not expensive and quite affordable to all the participants in the focus group. Participant F commented "I think the key issue is that if you are just up to the home page and online catalogue, everybody will see the benefit from it, but if you go beyond the online catalogue there will be a lot of issues to consider, where most of the benefits and the risks involved". The cost as a factor in adoption simple technology was not an issue in this research.

Compatibility

When asked about the compatibility of the technology to their internal value system, and internal technological systems in place, the participants indicated that such issues did not impede the adoption decision of EC. All the participants indicated that, "business people in New Zealand has no aversion to technology". The participants re-emphasised again that it is when they advance to the envisaged sophisticated EC initiatives that incompatibility issues might arise as major barriers to EC adoption. The participants specifically highlighted legal concerns, contract enforceability, security and the lack of the ink-signature as major impediments over the Internet.

Competition and the international perspective

Most of the participants indicated that their competitors played a positive role on their adoption decision of EC but was not an essential one. As most of the participants were at the low levels of EC, they indicated that their competitors were at a similar position. Participant D commented, "we have been always looking for an innovative way of using technology in the business but usually not forced into it, I will do it whether my competitors have it or not.... this is the way I am".

External support from technology vendors

In discussing the experiences of the participants with technology vendors and consultants, most of the participants were not pleased with their services. For example, participant B indicated that their Web site designer used an existing and simple template to design their Web site. Although participant B admits that it was an initial and a cheaper option to follow but the designer was not able to deliver a full and complete solution. Participant A indicated that he faced a problem with their Web site, "... we had a Web site produced professionally and we really did not like it in terms of the appearance and the designer did not want to change it...in the end we did it ourselves from scratch...". However, participant D retained positive attitude toward technology vendors, as he was relying on fresh graduate and students in developing his Web site, as a cheaper option.

Pressure from supplier/buyer

When the participants were requested to discuss on the impact of their buyers on their adoption decision of EC, they all indicated that their buyers would influence their decision positively and significantly. It is the customer that drives the business activities. Participant A commented, "all our overseas buyers communicate with us by email only ...it is essential, fast and cheap and its great.... while in New Zealand most of our clients are farmers and some of them communicate with us by email". As for the impact of suppliers on their adoption for EC, most of the participants indicated that their suppliers have no effect on their adoption decision of EC.

CEO's Innovativeness and involvement

When the participants were requested to discuss and explain the innovative role of the CEO in EC adoption, they all indicated that in small business the CEO is the main person behind most of the different initiatives in the company. Participant A commented, "in a small company the CEO carries a lot of weight.... and when you do not have a specialist in house". Participant F commented, "the CEO is actively engaged in the conversation of the subject.... comes up with ideas of his own and seek feedback". On the other hand, the participants indicated that factors such as fear of technology and older CEOs might resist change and vote against the adoption of EC and hence, could negatively affect the adoption decision of EC.

The participants indicated that in small business the CEO is not only involved in the adoption decision but is also involved in the whole EC project, e.g., selecting suppliers, supervising the project.

DISCUSSION AND CONCLUSION

The focus group research has assisted in rationalising the adoption scenario of EC in SMEs in New Zealand by providing rich insights and unveiling the dynamics behind the adoption decision of EC. Most of the participants emphasised that the adoption decision of EC is strongly influenced by the entrepreneurial context. The CEO's innovativeness and involvement were emphasised by all the participants as being important determinants of adoption.

At the forefront of the technological context sets the relative advantage perspective and whether the technology is able to provide advantages (tangible Vs. intangible) to the business. Upon identifying a suitable technology for the business, the SMEs would assess its financial feasibility in the light of its advantages. If the advantages were simple or intangible and the costs involved in achieving such advantages were affordable, the SMEs would not hesitate adopting such technology. The compatibility factor emerged as a highly significant one in the envisaged advanced EC initiatives.

The participants emphasised the importance of their buyers as being the main driver for their adoption decision of EC. Support from technology vendors was highlighted as an important determinant but due to the participants' negative views about technology vendors, it would impede the adoption decision. It was suggested that the SMEs in the focus group were not critical in assessing the impact of their competitors on their adoption decision of EC. However, they envisaged adopting and using EC more strategically in the future in order to stay ahead of their competitors. Finally, the SMEs in the focus group would look at their products (information intensity) and hence, assess their suitability to the EC arena.

The focus group results thus far, highlight two main issues pertaining to EC adoption. Firstly, at the low levels of EC initiatives, none of the previously identified factors such as high cost and incompatibility seemed to impede EC adoption in this research. On the other hand, the drivers of EC adoption did not appear to be highly significant and hence, making the attitude amongst the different participants toward EC uncritical "adopt minimally to the level not to invest (time and money) heavily on EC, as the advanced EC initiatives were perceived to be highly risky projects". Therefore, most of the participants' initiatives were described to be initial, not strategic, and not costly and used a simple Web presence (not Web site). At this level of usage, compatibility issues would not even emerge as deterrents of adoption.

Secondly, it is at the more advanced levels of EC initiatives (e.g., interactive Web sites) that the participants started to stress the importance of EC to their businesses and the significance of the different factors on their adoption decision of EC. At that perceived level of sophistication, the participants ranked cost and the compatibility higher. The participants highlighted the need for help from experts in the field in order to show them how to extract more business opportunities from EC.

Specifics pertaining to products (information content) which pointed to industry specifics as well were exceptions to the above two perspectives. Hence, industries which possess products with high information content and international clients, were found to adopt eCommerce more strategically than other SMEs. This is an area for further research.

This research introduced potential determinants of EC adoption in SMEs in New Zealand and provided rich descriptions about different accelerators and impediments to the adoption decision of EC. Thus, addressing those factors by researchers, professional and policymakers alongside the two adoption perspectives discussed above could contribute to the wide success of EC in SMEs in New Zealand and elsewhere. Undertaking more focus group studies could yield more generalisable results.

REFERENCES

- Aaker, D., Kumar, V. & Day, G. (1998). *Marketing research (6th edition)*. New York: John Wiley & Sons, Inc.
- Abell, W. & Lim, L. (1996). Business use of the Internet in New Zealand: An exploratory study. Retrieved August 8, 2000 from the Web: <http://www.scu.edu.au/ausweb96/business/abell/paper.htm>
- Abell, W. & Black, S. (1997). Business use of the Internet in New Zealand: A follow-up study. Retrieved August 8, 2000 from the Web: <http://www.scu.edu.au/ausweb96/business/abell/paper.htm>
- Adam, S & Deans, K. (2000) Online Business in Australia and New Zealand: Crossing a Chasm AusWeb2k-The Sixth Australian World Wide Web Conference, Rihga Colonial Club Resort, Cairns, 12-17 June 2000, <http://ausweb.scu.edu.au/aw2k/papers/adam/paper.html> (8/8/2000)
- Blackburn, R. & Stokes, D. (2000). Breaking down the barriers: Using focus groups to research small and medium sized enterprises. *International Small Business Journal*, 19(1), 44-67.
- Blili, S. & Raymond, L. (1993). Information technology: Threats and opportunities for small and medium-sized enterprises. *International Journal of Information Management*, 13, 439-448.
- Bloor, M., Frankland, J., Thomas, M. & Robson, K. (2001). *Focus groups in social research*. London: Sage Publications.
- Choi, S., Stahl, D. & Whinston, A. (1997). *The economic of electronic commerce*. Indiana: Macmillan Technical Publishing.
- Clarke, R. (1999a). Appropriate research methods for electronic commerce. Retrieved March 16, 2000 from the Web: <http://www.anu.edu.au/people/Roger.Clarke/ResMeth.html>
- Clarke, R. (1999b). Focus groups. Retrieved July 25, 2002 from the Web: <http://www.xamax.com.au/Res/FocusGrps.html>
- Clarke, R. (2001). If eBusiness is different then research in eBusiness is two. Retrieved July 25, 2002 from the Web: <http://www.anu.edu.au/people/Roger.Clarke/EC/EBR0106.html>
- Cragg, P. & King, M. (1992). Information systems sophistication and financial performance of small engineering firms. *European Journal of Information Systems*, 1(6), 417-426.
- Cragg, P. & King, M. (1993). Small-Firm computing: Motivators and inhibitors. *MIS Quarterly*, March, 47-59.
- Krueger, R. (1994). *Focus group: A practical guide for applied research (2nd Edition)*. Thousand Oaks: Sage Publications.
- (MOED) Ministry of Economic Development (January 2000a). *SMEs in New Zealand: Structure and Dynamics, Firm Capability Team, update Report*. Retrieved May 5, 2000 from the Web: http://www.MOED.govt.nz/gbl/bus_dev/smes2/index.html#TopOfPage
- (MOED) Ministry of Economic Development (October 2000b). *Electronic commerce in New Zealand: A survey of business use of the Internet information technology*. Policy Group Competition and Enterprise branch. Retrieved May 16, 2001 from the Web: <http://www.ecommerce.govt.nz/ecat/resources/index.html>
- Morgan, L. (1997). *Focus groups as qualitative research (2nd Edition)*. Thousand Oaks: Sage Publications.
- Morgan, L. (1998). *The focus group guidebook: Focus group kit volume 1*. Thousand Oaks: Sage Publications.
- Poon, S. (2000). Business environment and Internet commerce benefits – a small business perspective. *European Journal of Information Systems*, 9, 72-81.
- Poon, S. & Swatman, P. (1995). The Internet for small businesses: An enabling infrastructure for competitiveness. Retrieved June 27, 2000 from the Web: <http://inet.nttam.com>
- Poon, S. & Swatman, P. (1997) Internet-Based small business communication. *International Journal of Electronic Commerce*, 7(2), 5-21.
- Poon, S. & Swatman, P. (1998) A Combined-Method study of small business Internet commerce. *International Journal of Electronic Commerce*, 2(3), 31-46.
- Poon, S. & Swatman, P. (1999a). An exploratory study of small business Internet commerce issues. *Information & Management*, 35, 9-18.
- Poon, S. & Swatman, P. (1999b). A longitudinal study of expectations in small business Internet commerce. *International Journal of Electronic Commerce*, 3(3), 21-33.
- Premkumar, G. & Roberts, M. (1999). Adoption of New Information Technologies in Rural Small Businesses. *The International Journal of Management Science (OMEGA)*, 27, 467-484.
- PWCH (PriceWaterhouseCoopers) (September 24 1999). SME Electronic Commerce Study (TEL05/97T). Retrieved April 10, 2000 from the Web: <http://apec.pwcglobal.com/sme.html>
- Stewart, D. & Shamdasani, P. (1990). *Focus groups: Theory and practice*. Newbury Park, California: Sage Publications, Inc.
- Swanson, E. B. (1994). Information systems innovation among organisations. *Management Science*, 40(9), 1069-1092.
- Teo, T., Tan, M., & Buk, W (1998). A Contingency Model of Internet Adoption in Singapore. *International Journal of Electronic Commerce*, 2(2), 95-118.
- Thong, J. (1999). An integrated model of information systems adoption in small business. *Journal of management information systems*, 15(4), pp. 187-214.
- Thong, J. & Yap, C. (1995). CEO characteristics, organisational, characteristics and information technology adoption in small business. *Omega, International Journal of Management Sciences*, 23(4), 429-442.
- Thong, J. & Yap, C. (1996). Information Technology Adoption by Small Business: An Empirical Study. In Kautz, K., & Pries-Heje, J. (Eds.). *Diffusion and Adoption of Information Technology* (160-175). London: Chapman & Hall.

0 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/proceeding-paper/electronic-commerce-small-businesses-new/32507

Related Content

Recognition and Analysis of Scene-Emotion in Photographic Works Based on AI Technology

Wenbin Yang (2023). *International Journal of Information Technologies and Systems Approach* (pp. 1-15).

www.irma-international.org/article/recognition-and-analysis-of-scene-emotion-in-photographic-works-based-on-ai-technology/326055

IT Service Management Architectures

Torben Tamboand Jacob Filtenborg (2018). *Encyclopedia of Information Science and Technology, Fourth Edition* (pp. 2920-2930).

www.irma-international.org/chapter/it-service-management-architectures/184003

Instructional Support for Collaborative Activities in Distance Education

Bernhard Ertl (2015). *Encyclopedia of Information Science and Technology, Third Edition* (pp. 2239-2248).

www.irma-international.org/chapter/instructional-support-for-collaborative-activities-in-distance-education/112635

Intelligent Logistics Vehicle Path Planning Using Fused Optimization Ant Colony Algorithm With Grid

Liyang Chu, Haifeng Guoand Qingshi Meng (2024). *International Journal of Information Technologies and Systems Approach* (pp. 1-20).

www.irma-international.org/article/intelligent-logistics-vehicle-path-planning-using-fused-optimization-ant-colony-algorithm-with-grid/342613

Repurchase Prediction of Community Group Purchase Users Based on Stacking Integrated Learning

Xiaoli Xie, Haiyuan Chen, Jianjun Yuand Jiangtao Wang (2022). *International Journal of Information Technologies and Systems Approach* (pp. 1-16).

www.irma-international.org/article/repurchase-prediction-of-community-group-purchase-users-based-on-stacking-integrated-learning/313972