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TO WHOM IT MAY CONCERN

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Optimising the implementation factors of a Web-based e-commerce adoption model

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Abstract

Although e-Commerce is being more extensively used in South Africa, the financial and economic viability of e-commerce is still questioned at times. The reliance on Information and Communication Technology (ICT) infrastructure and systems, slow bridging of graphical distances or reliance on poor network availability often impedes e-commerce adoption. These aspects may even act as barriers to successful e-commerce adoption. Recognising that e-Commerce evolved from rudimentary websites to more sophisticated web-based customer-service systems, business often queries the maturity of the Internet[1] and Web[2] technologies, and are concerned to what extent new technologies, including social media can add value to their businesses. In addition, the importance of adopting e-commerce governed by managerial and business requirements is known and it is now more common not to use the Web as merely an add-on feature to augment traditional business channels such as direct selling, marketing and supply chains, but to be an integrated into business activity. Some entities continue to opt for short-term solutions creating static Web pages to at least have a Web presence, however, business opportunities and other issues come to play once businesses are faced with e-commerce adoption decisions. This is especially true for Small and Medium Enterprises (SMMEs), as they are not a set of homogeneous businesses, but differ by attributes such as size, sector, background and location. Literature reveals examples of success stories of e-commerce adoption and often reports on international and, to a lesser degree on South African (local) studies. Business models are essential and play prominent roles in business operations. In this instance, e-commerce adoption models need to have theoretical as well as practical application components to assist real-world problems, thereby benefiting SMMEs. This paper revisits the implementation factors of an e-commerce adoption model four years on, obtaining evidence of the relevancy and optimises the 94 adoption factors.

Keywords: e-Commerce adoption; e-Commerce adoption models; SSMEs; SMEs; ICT

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1 A global network of networks enabling all kinds of computers to directly and transparently communicate and share services across the world (Internet Society Annual Report, 2003).

2 Commonly refers to the World Wide Web, an Internet-based hypermedia initiative for global information sharing.

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1 Introduction

The adoption of electronic commerce (e-commerce) has become an accepted phenomenon in South Africa and the emergence of e-commerce from about 2002 has impacted online trading, not only in technology related fields, but also in areas such as marketing, travel, financial services, consulting and others. e-Commerce adoption is not merely conducting business using the Web, but factors such as cultural, political, legislative and environmental aspects all need to be considered (Klopper, 2002; Mohammed, Fisher, Jaworski & Cahill, 2002:204; Hoffman & Novak, 2000:179-180; Braga, 2005:544). The maturing of the Web has required understanding and changing the way businesses communicate, how they trade (buy and sell) and share information with business suppliers, partners and staff. It is also important to keep the danger of "…over-promise and under delivery" in mind, already stated eight years ago (Hartley & Worthington-Smith, 2003:3). A number of e-commerce adoption uncertainties still exists such as; what impact will it have on customer relations, what are the product selection criteria, are reported security and trust issues real, are fraud and privacy issues exasperated by e-commerce and others (Braga 2005:544). In addition, aspects such as viral marketing, customer experience, bandwidth issues, online customer maintenance are not fully resolved (Boschma & Weltevreden, 2005:2; Reichheld & Schefter, 2000:105-106). This paper reports on optimising the implementation factors of an e-commerce adoption model, specifically developed for SMMEs (Warden, 2007:243).

2 Background

Various e-Commerce adoption definitions in literature simply refers to the process of conducting business online, spanning both Business-to-Business (B2B) and Business-to-Consumer (B2C) markets aimed to reach global players, gaining market share for competitive advantage, utilising telecommunication networks. After extensive literature analysis followed by case studies, the authors are using the following e-commerce adoption definition to serve as a basis to ensure all adoption factors analysed, are relevant (Warden, 2007:58).

> **e-Commerce adoption:** *Cost effective way to reach global players, gaining market share, streamlining a wide spectrum of business processes and technology for competitive advantage utilising telecommunication networks, improving relationships, advantageous to early adopters, willing to change and improve communication - internally and externally, ensuring sufficient resources and skilled-staff.*

In this definition a number of important key-words and phrases have emanated and are used to explain the adoption concept to the selected SMME interviewed. The next section briefly covers models, to put the concept of this research paper into perspective.

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3 Brief overview of models

A model should be aligned to support business and be used interactively. Furthermore, a model is an overall framework for how we look at reality (Silverman, 2005:97–100) and as far as business models are concerned, models are used to describe how organisations conduct business to generate revenue in order to sustain itself, also in future (Turban, King, Viehland & Lee, 2006:22–24). A model should ideally provide characteristics of *flexibility* and *adaptability.* Morecroft Lane and Viita (1991:114) highlight the importance of retaining flexibility in model creation and mention specifically; room for discussion, interpretation and new ideas being important aspects to consider within the boundaries defined by a model. Business models rely on various business subjects. This could for example, include economics, finance, marketing, operations, entrepreneurship and strategy (Chesbrough and Rosenbloom, 2002:529-532). Osterwalder (2004:147) asserts that an important aspect to consider, with reference to business model development, is the alignment of business strategy and a business processes model. This contributes to the successful operation of a business. Furthermore, the importance of aligning both, business strategies and business processes, contribute to successful operational businesses in model development. This view is supported by Mansfield and Fourie (2004:35) stating that a good business model alone, being sufficient for survival in a networked economy, is misleading and possibly a key contributor for failed networked ventures.

4 Aim of the research

Although the most probable implementation factors of the e-commerce adoption model are handy and useable, the authors aimed to optimise the adoption factors at the implementation level by ranking them as a refinement to the e-commerce adoption model, four years later.

5 Research method

A single case study research strategy is used in this paper. According to Yin (2003:5) case study research uses a number of methods to collect data, which may be both qualitative and quantitative. When a phenomenon to be investigated is not readily distinguishable from its context, *how and why* type questions should be used to attempt understanding the phenomenon. Furthermore, the strength of case study methodology lies in establishing a good relationship with research subjects, leading to in-depth insight. According to Rule and John (2011:3), a case study could be viewed as a particular instance, circumstances or problem to be investigated.

5.1 Mixed method research

A mixed method research strategy is used for this research using both, qualitative and quantitative methods. The characteristic of a quantitative approach emphasises quantification of constructs, thereby assigning numbers to statements depending on the respondent's agreement or disagreement (Babbie & Mouton, 2006:49). In contrast, the characteristics of a qualitative paradigm are to provide a research mechanism to assist researchers finding evidence inaccessible by statistical

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procedures or other means of quantification (Strauss and Corbin (1998:11). In such cases, hermeneutic approaches are preferable to analyse findings (Remenyi, Williams, Money & Swartz, 1998:288).

5.2 Questionnaire

A summated attitude five-point Lickert scale explained by Welman, Kruger & Mitchell (2009:157) is used on all 94 adoption factors. A scale from one to five is used corresponding to the degree of agreement or disagreement with each adoption factor in the case of the selected online business. This ranges from not applicable (5), rarely applicable, applicable, very applicable to most applicable (1). The questionnaire also provides open ended questions to solicit clarity or provide alternative suggestions – normally in some of the more complicated adoption factor issues.

5.3 Research model

The e-commerce adoption model used adhered to the general requirements of models, some of which are summarised in section 3, and other aspects from literature (Warden, 2007:243). The e-commerce adoption model is structured containing the following levels:

- **Strategic level -** accommodates strategic matters such as the planning stage and resolution of ICT issues, for example.
- **Operational level** - deals with the business model dynamics and includes activities such as business process architecture, business opportunities and business change.
- **Implementation level -** supports business processes adoption and implementation aspects.

Although the implementation level of the model is analysed and optimised in this paper, the operational level had to serve as the starting point with its eight operational identifiers, being:

- **Virtualisation** – disseminating and collecting information, electronic transaction processing, while products and services may remain physical.
- **Molecularisation** - breaking the economy up into small units due to improvement in access and quality of information.
- **Disintermediation** - traditional intermediary businesses circumvented due to the emergence of networks
- **Marketing** - enhancing customer relationships, dealing with competitors, branding and understanding the market in which they trade
- **e-Commerce development** - management of funds, logistics and customer support and services by identifying elements that support an e-commerce operations strategy for e-business opportunities and challenges.
- **Technical** - management of online technology services, secure transactions and efficient access, facilitation of technology to support e-

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commerce transactions and efficient online technologies, especially web-based systems.

- **Behavioural** - management of over expectancy and under-delivery and building customer loyalty and confidence by maintaining customer expectation and interpretation of all the stimuli encountered, while interacting with the business

- **Value proposition –** management of over competitive advantage using information for increased sales, lowered costs and competitive marketing - a description of the customer problem, the product that addresses the problem and the value of the product from the customer's perspective.

These identifiers in turn are extended to 94 adoption factors (at the implementation level). These factors are grouped into four sections and optimised in Tables 1, 2, 3 and 4 being the obtained results (section 7).

6 Conducting the research

An interview was conducted at the premises of the selected online SMME. Firstly, the e-commerce adoption definition (Section 2) was discussed to put the research activity into the proper perspective and general clarity. Secondly, a questionnaire (Section 5.2) was administered by the researchers after explaining the questionnaire structure and layout, as it consisted of eight tables, totalling 94 adoption factors. A number of open-ended questions were also identified and recorded.

7 Analysis of findings

In each of the four tables, the adoption factors are ranked (1-5) representing an optimised list of adoption factors. Although the original adoption factors were designated as 46 randomly presented most probable factors, this research has produced 68 factors, all most applicable. This is significantly more than the original identified 46 most appropriate adoption factors, but the number is not the issue, rather the ranking of each list. These ranked lists provide a more accurate spread of adoption factors clearly indicating which are most applicable to the least applicable factors. It was found that the respondents accepted all the factors and the qualitative responses were merely comments and affirmations, not providing any new evidence.

Table 1 Strategic implementation factors

Virtualisation-15	Molecularisation-5	Disintermediation-6	Marketing-7
1-Enhance customer reach 1-Provide online transaction processing 1-Ease distribution of products or services 1-Reduce searching cost 1-Facilitate real time access to information	1-Provide superior online service 1-Provide access to 3rd party products 1-Develop co-products 1-Facilitate virtual community participation 1-Enhance trust in	1-Establish direct link to customers 1-Eliminate intermediaries 1-Explore new markets 1-Control business network centrally 1-Create new products 1-Awareness of rivalry amongst competitors	1-Manage Place – distribution 1-Maintain competitive Pricing 1-Develop marketing strategy (Online) 1-Foster community communication 1-Develop marketing strategy (Offline)

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1-Maintain market segment 1-Promote online trading to build brand name 1-Manage negative working capital 1-Provide complementary products 1-Lower distribution cost of products and services 1-Meeting customer needs 1-Manage marketing and advertising 1-Facilitate upgrade path to integrated e-commerce 1-Lower distribution costs 1-Selection of products and services 3-Awareness that Web sites expose businesses 3-Act as information broker 5-Provide price comparison	partners and reputation 2-Awareness of SMMEs quick response to opportunities 2-Provide customisation 3-Develop personalisation 3-Manage first mover danger 3-Improved stakeholder relationships 5-Facilitate joining networks 5-Foster e-Loyalty	5-Monitor large companies outsourcing to SMMEs	1-Develop online strategy 1-Promote marketing strategy 3-Adapt to Promotion - communication 4-Product development 5-Develop business strategy 5-Promote integrative marketing strategy

Table 2 Operational implementation factors

e-Commerce development-9
1-Provide competitive advantage 1-Promote online process across operation 1-Maintain customer support essential for survival organistation 1-Maintain new communication and IS 1-Manage capital equipment and skills resources 1-Maintain specialised business skills and knowledge 1-Foster communication and interaction 1-Provide just in time logistics 1-Manage customer bargaining power 3-Manage culture influences 5-Promote online process across organisation 5-Redeploy staff

Table 3 Technical implementation factors

Technical-12
1-Develop core technological know-how 1-Maintain system authentication 1-Manage bandwidth capping 1-Maintain system security 1-Honour user privacy 1-Maintain fast communication line speed 1-Promote convenient shopping 1-Keep check on ICT costs 1-Focus processes across organisation 1-Select suitable of equipment 1-Deliver correct products 1-Develop new system products 3-Provide easy to access customer information 3-Utilise open architecture and standards 3-Manage extraction of product information

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Table 4 Behavioural including value proposition implementation factors

Behavioural-7	Value proposition-7
1-Ensure customers defend the experience 1-Provide online benefit 1-Assist customers to have consistent experience 1-Develop customer trust 1-Provide exceptional value 1-Be significantly better 1-Ensure customers take message to market 5-Provide substitute products	1-Maintain customer needs 1-Awareness of business needs 1-Provide correct product delivery 1-Maintain efficient service delivery 1-Manage access to sales information 1-Manage timing to market: Long-term 1-Facilitate any place, anytime 3-Foster fast market response 3-Ensure timing to market: Short term 3-Provide access to financial information 3-Safeguard access to customer data

8 Conclusion

The authors revisiting the original e-commerce adoption model lead to the conclusion that the model represents a well designed and useful 4x3 matrix model. The model further provides e-commerce adoption factors for strategic, operational, technical and behavioural aspects at a strategic, operational and implementation business level operation. This however, was not the aim of this paper but nevertheless, an important finding as far as the useability of the model is concerned for SMMEs and others. Coupled with this observation, is the achieved aim of the paper providing newly structured e-commerce adoption factors at the implementation level. This is an improvement on the overall useability of the adoption model.

The model characteristics of *flexibility* and *adaptability* discussed in section 3 is realised by users being able to easily access any of the four categories of adoption factors for their own specific use. Finally, it is left to the reader to obtain the original model and augment Tables 1 to 4 to the model for further exploration.

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