Innovation in e-Business Models: a Net-Enabled Business Innovation Cycle (NEBIC) Theory Perspective

by

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AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

Despite potentially increased sales and operational efficiencies, a surprising number of firms have not adopted e-business. Annual surveys of e-business use in Canada and other Organization for Economic Co-operation and Development (OECD) countries reveal significant differences in adoption rates between sectors. The surveys identify product characteristics as a key rationale for not adopting online selling. There are examples, however, of firms in all sectors that have discovered how to use online selling (i.e., through direct retailing, portals, online auctions - or other models). This research identifies the key internal capabilities that let firms implement online selling tools and reconfigure their way of doing business, by innovating their business model, to take advantage of e-business.

Wheeler's (2002) Net-Enabled Business Innovation Cycle (NEBIC) model is a theoretical framework for studying the process of implementing e-business tools as technology innovations for business growth where "net-enablement" refers to a firm's innovative use of networks connected via information technologies. The NEBIC model suggests four sets of capabilities a firm needs to create value for its customers by utilizing technology: choosing enabling technologies, matching technology benefits with economic opportunities, executing business innovation for growth, and assessing customer value. The model is grounded in dynamic capability and absorptive capacity theories, offering an integrated way to adopt an e-business application, such as online selling, using internal capabilities that management can develop through planning, knowledge acquisition, training, and recruitment.

This research is the first to operationalize the constructs in the NEBIC model and increase the understanding of the firm capabilities required to implement online selling as a technology innovation for business growth. The study also extends the NEBIC model by developing a construct to measure

the innovation in business models firms need as they implement online selling tools. Data gathered from a national sample of Canadian firms are analyzed to test four hypotheses. These concern net-enablement capabilities, and the selection and implementation of online selling, together with the associated outcome of such innovation in terms of business model innovation.

The overarching hypothesis is that firms that successfully select and implement online selling have better developed net-enablement capabilities. Further, those firms will innovate their business model. The research to test these hypotheses proceeded in two stages. First, exploratory research accessed both current literature and feedback from academic and professional experts to identify and develop scales and measurements for the net-enablement constructs of the research model. In the second empirical stage, these scales were used to measure capability development and business model innovation in a cross-section sample of Canadian firms. Responses to an online survey were analyzed to test the statistical properties of the scales, and structural equation modeling (SEM) assessed the hypothesized relationships between net-enablement capability for online selling and actual business model innovation.

The research contributes to the literature on e-business adoption, and the application of dynamic capability and absorptive capability theories for technology adoption. In particular, it provides empirical support for Wheeler's NEBIC model for e-business tools selection and implementation. The data confirm that firms with better-developed net-enablement capabilities are more likely to select and implement online selling tools successfully. The data also substantiate the view that online sellers have indeed innovated their business models to incorporate the practical tools of online selling.

Practitioners considering extending their market through online sales are advised to assess their net-enablement capability first. The scales developed through this research provide a tool for identifying these important capabilities and routines within organizations. It is particularly important that firms looking to incorporate online selling should evaluate (and develop as necessary) their ability to access new technology; evaluate their strategic options and match them with the benefits of the proposed technology; handle, manage, and implement the project; and reconfigure elements of their business model, i.e., make changes to their product or service and its payment methods. Successful online sellers do not depend on a single factor; rather they develop “net-enablement” capability, a continuous and multi-faceted process of related capability sets that involve all parts of the organization.

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Dedication

I lovingly dedicate this thesis to my parents, wife, and children who supported me each step of the way. You have given me so much.

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Chapter 1
Introduction

1.1 Motivations

Despite the promise of e-business increased productivity and sales, only about 9% of Canadian firms sell online (Statistics Canada, 2007). Some industries like music and software have been radically transformed by online sales, while some remain virtually untouched by this new technology. In every sector, however, there are a few examples of firms that have transformed their business model to benefit from selling online. The research reported in this dissertation begins to uncover the internal capabilities that help these firms to innovate and adopt online selling, even when most other firms in their sector have failed to do so, and the characteristics of their product/service may at first seem challenging to sell in a digital environment.

Dozens of studies have been conducted on e-business for specialized lines of inquiry (e.g., online buying, Email use, Internet use, Website presence, and e-collaboration), but the online selling aspects have been only partially addressed. It has been suggested in the literature that future research should investigate the nature of online selling and the challenges faced by online sellers (e.g., Bakos, 1997; Stockdale & Standing, 2002; Rask & Kragh, 2004). Additionally, online selling, compared with other e-business tools, has a lower rate of adoption by firms. According to Statistics Canada (2007), while Internet use, Email use, Website presence, and online buying use had an average adoption rate ranging from about 40% to 80%, online selling adoption had an average of only 9% across all Canadian sectors.

Not only the proportion of firms selling online is much lower than might be expected from rhetoric about the benefits of e-business, online selling adoption rates also exhibit considerable variability across sectors ranging from about 0% to 30%. Figure 1.1 illustrates that wide variability.

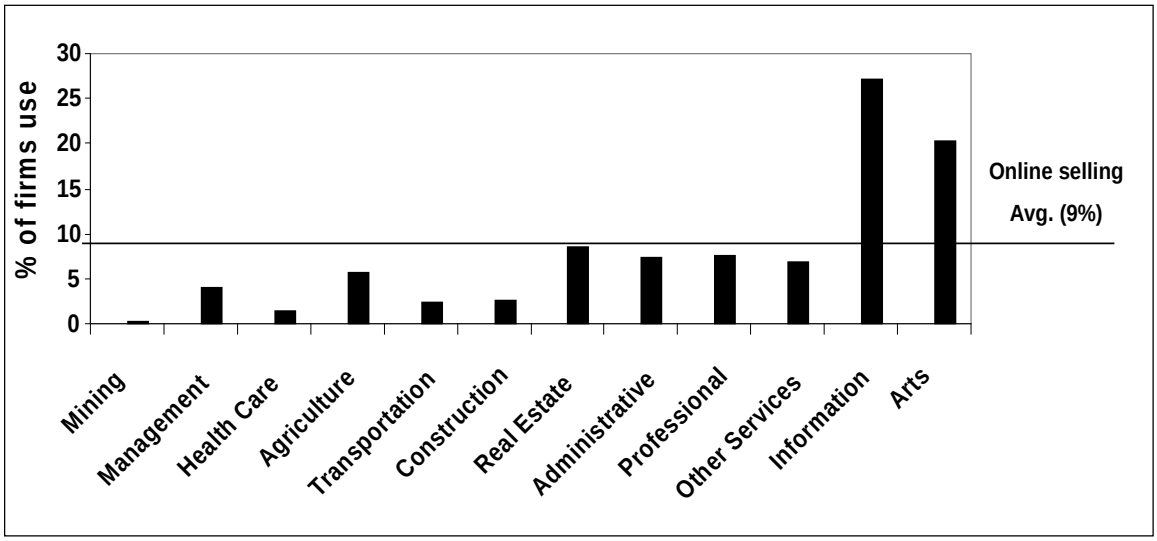


Figure 1.1: Percentage of online selling for some of the Canadian sectors (Statistics Canada, 2007).

This variability in adoption rate between sectors has led researchers to seek the motivations that drive firms to adopt online selling tools. Some suggest that this variability can be attributed to business environments that encourage such adoption, while the absence of such environments might result in lower adoption rates (e.g., Rask & Kargh, 2004; Kioses et al., 2006). An entire business sector may be unfamiliar with the technology needed to implement online sales. In this example, almost all of the firms within that sector, rather than selling online, sell solely via traditional channels of commerce (Stockdale & Standing, 2002; Rask & Kargh, 2004; Stennes et al., 2006).

Other researchers, referring to the selling process that characterises some products and services, stress the easiness (e.g., Bakker, 2000; OECD, 2001; Loane et al., 2004). Likely sale of products/services online (e.g., computer software, music, and videos) is believed to be a significant force that drives

some sectors to have higher rates of online selling adoption. On the other hand, some other sectors find it difficult to sell their products/services online. Examples would be sectors with low value-to-weight ratio products (e.g., mining), and sectors that require inter-personal contact to deliver a service (e.g., health care).

Despite the challenging business environments that some sectors may face, and/or the inherent difficulties in selling their products within the online context, some firms belonging to such sectors have innovated and adapted their product and/or services to sell online. Table 1.1 presents interesting and innovative examples of products/services that are sold online.

Within this context, an aspect that has been ignored in the literature is the possibility that the internal organizational capabilities can be a significant driving force for online selling adoption. Rather than focusing on business environments and the products/services characteristics, the research reported in this dissertation takes the above view, thus adding to an understanding of the online selling adoption process.

1.2 Research Objectives

The aim of the research is to address the following research questions:

RQ1: What are the internal organizational capabilities that help firms to implement online selling tools as business innovation for growth?

RQ2: What are the changes in the way of doing business (i.e., business model innovation) that firms need to make, in order to take full advantage of the opportunities offered by online selling?

Example A: Bull Semen - Inimex Genetics Ltd.

A British company that sells bull semen products online. These products include sexed semen, beef sires, and milk sires.

Sector: Agriculture, forestry, fishing, and hunting [11]
Website: http://www.bullsemen.com/
E-business type: Business to Business (B2B) and Business to Customer (B2C)

Example B: Windsor Salt Company

A Canadian company that sells salt products online. These products include household and food products as well as agricultural, water softening, and industrial products.

Sector: Mining, quarrying, and oil and gas extraction [21]
Website: http://www.windsorsalt.com/
E-business type: B2C

Example C: Jakeman's Maple Products

A Canadian company that sells maple syrup products online. The company offers a wide range of maple products, such as syrup, sugar, confections, tea, butter, pretzels, and so on.

Sector: Agriculture, forestry, fishing, and hunting [11]
Website: http://www.themaplestore.com/aboutus.htm
E-business type: B2B and B2C

Example D: Asia Barsoski Creative Services

This company provides many products and services online. These include image development, creating advertising and marketing materials, developing illustrations, Web design, and souvenirs crafted by designers.

Sector: Professional, scientific, and technical services [54]
Website: http://www.asiabcs.com/
E-business type: B2C

Example E: Hamilton Core Drill Bits Magnets

A U.S. company that sells concrete carbide-tipped core drill bits to tradesmen. This company sells such products as temperature controllers, concrete core hammer drill bits, and induction heaters and offers both fixed and dynamic pricing.

Sector: Construction [23]
Website: http://stores.ebay.ca/Hamilton-Core-Drill-Bits-Magnets
E-business type: B2B, B2C, and dynamic prices (i.e., auction)

Table 1.1: Examples of innovative products/services that are not normally sold online.

To address these questions, this study uses the theory of the Net-Enabled Business Innovation Cycle (NEBIC), originally developed by Wheeler (2002). The theory is based on both dynamic capability and absorptive capacity. NEBIC is a theoretical model for net-enablement, associating customer value-creation with well net-enablement capability developed internally within an organization. This capability is important for technology selection and effective implementation that results in growth being achieved. Based on the NEBIC model, three interacting constructs were adapted to measure net-enablement capability for technology adoption: 1) choosing enabling technologies (CET); 2) matching proposed technologies with economic opportunities (MEO); and 3) executing information technology as business innovation for growth (EITBIG).

In addressing the first research question, the collected data have been categorized into two groups: firms that do not sell online and those who choose to sell online. Assessing the level of development in net-enablement capability for both parties is useful. It can help in predicting the relationship between the net-enablement capability and the decision to sell online.

The extent to which firms have developed their net-enablement capability may also be relevant to the variability of online selling adoption rates that are seen across sectors. Accordingly, the model further tests whether sectors with different levels of online selling adoption rates behave differently. Thus, the research targets two sets of sectors: (1) those with below-average rates of online selling and (2) those with higher rates of online selling. Selecting sectors with below-average and above-average adoption rates is conducive to the research, as all sectors have some firms that do sell online and have innovated their business models accordingly.

In addressing the second research question, the NEBIC model is extended to include an additional construct to measure business model innovation that online seller developed while adopting online selling (BMIOS). Adopting a new technology, many researchers argue, requires full utilization of the opportunities of that technology. This results in additional innovations in business models (e.g., Teece et al., 1997; Ciborra, 2009).

Overall, this research examines four hypotheses. The first hypothesis (H_1) describes the levels of development in net-enablement constructs between online sellers and non-online sellers. The t-test for equality of means, which is a tool within the analysis of variance (ANOVA) procedure, is used to test this hypothesis. The other three hypotheses (H_2, H_3, and H_4) describe the relationships among the research constructs including the fourth added construct, which serves as a dependent variable for the research model. The SEM analytical technique using AMOS 18 tests these hypotheses and the possible impact of control variables on the dependent variable of BMIOS. The SEM-hierarchical analysis technique assesses the unidimensionality of the research constructs.

Discussions are included on the structure of the research model's net-enablement constructs (i.e., CET, MEO, and EITBIG) which represent first-order factors. Because each one of them possesses one or more sub-dimensions and the research uses Structural Equation Modeling (SEM), an alternative term (i.e., second-order factors) is used to describe the dimensions of each construct.

1.3 Theoretical Contributions

The contribution of this research rests in four theoretical areas. First, it enhances the underlying theories of dynamic capability, absorptive capacity, and NEBIC, and measures a firm's ability to use its resources to keep abreast of changing environments. This research also develops clear

measurement scales so that the research model constructs can respond to criticism in the literature, suggesting that dynamic capability theory is vague and difficult to identify (e.g., Lawson & Samson, 2001; Wang & Ahmed, 2007). The study also measures the impact of prior knowledge developed within a firm on that firm's decision to adopt technology and business model innovation. This is to measure the impact of absorptive capacity originally proposed by Cohen and Levinthal (1990) and to accommodate Bosch et al.'s (1999) suggestion of considering the effect of a firm's culture on its absorptive capacity.

From a NEBIC model perspective, the research builds on the prior research of net-enablement (e.g., Menon et al., 1999; Cameron & Quinn, 1999; Wheeler, 2002; Williams, 2004; Akgun et al., 2006). This dissertation is the first to develop empirical measures for the constructs in the NEBIC model. These measures identify and assess the important internal capabilities that firms can develop, that aid new technology adoption.

Second, this study extends the NEBIC model by developing a scale to identify and assess the innovations occurring in firms that adopt online selling. This is in response to the literature that suggests a relationship between technology adoption and business model innovation (e.g., Teece et al., 1997; Ciborra, 2009). However, this relationship has not been tested within the online selling adoption context. In addition to the scale for business model innovation, this research develops and tests the relationship between net-enablement capability of online selling, and business model innovation. As an outcome, it suggests a positive relationship between a firm's net-enablement capability for online selling, and innovation in the firm's business model.

Third, the research contributes to understanding of technology adoption in general and online selling adoption in particular. This understanding is achieved by developing a model that precisely and systematically describes the internal net-enablement capability of firms that select and implement online selling tools. Additionally, it describes the associated innovation in business models for online selling (i.e., changes/modifications in the way of doing business including products/services, sales channels, and more).

Fourth, the research responds to the portion of the literature that suggests investigating sectors that have below-average rates of online selling adoption (e.g., Vlosky, 1999; Stennes et al., 2006) and identifies how some firms within these sectors have successfully sold their products/services online and innovated their business models. The study further shows how these firms differ from those in sectors with higher adoption rates. The findings indicate that net-enablement capability is a significant internal factor that positively affects innovation in business models for online sellers across different sectors, regardless of the level of online selling adoption rate.

1.4 Practical Contributions and Further Research

E-business has potential to increase productivity and expand markets (especially internationally). Thus, government agencies concerned with economic development and trade are keen to promote adoption of e-business. By focusing on internal capabilities, this research identifies routines that firms can develop through hiring, training or outsourcing – actions that will help them to adopt new technologies such as selling online.

This research provides useful guidelines to assist practitioners that have not implemented online selling, and those failing in such implementation. For those already selling online, it should prove

equally useful. The research demonstrates that practitioners should consider net-enablement capability and practices used by successful online sellers relative to CET, MEO, EITBIG, and the associated innovations in business models. Firms are invited to sense market signals of changing business environments and offer new ideas and initiatives, i.e., adopting online selling. These new ideas necessitate innovations in business models, and firms are encouraged to develop and use their internal capabilities to create strategic advantages and use such capabilities for business model innovation, and, ultimately, for customer value creation.

This study also provides direction for future research – in developing a scale for the remaining construct of NEBIC (i.e., assessing customer value capability) and establishing new hypotheses not covered in the present research. It is further recommended that such enquiry should replicate the research context for validation purposes, and examine experiences in the Canadian public sector and other countries.

1.5 Research Outline

The thesis contains six chapters. Following the Introduction that is Chapter 1, Chapter 2 reviews the literature related to information technology adoption and the different types of e-business tools. In Chapter 3, the research model's underlying theories of dynamic capability, absorptive capacity, and the NEBIC model, are discussed. This chapter concludes by describing the current research model and its hypotheses.

The methodology used to test the research model is offered in Chapter 4, with discussion of the exploratory stage of the research and the different steps taken. The chapter offers an introductory

assessment and findings for the empirical stage of the research, including Common Method Variance (CMV), non-response bias, and data imputation.

Chapter 5 reports the different analyses, assessments, and tests used to validate the research model, including exploratory factor analysis (EFA), to determine the underlying structure of the collected data. Confirmatory factor analysis (CFA) addresses the research items' and hypotheses' validity of the underlying structure produced in EFA. A rigorous hierarchical analysis is presented to assess the dimensionality of each research construct, to confirm or refute the previous empirical findings of EFA and CFA and the theoretical assumption for the constructs' dimensionality. The chapter concludes by reporting the results of the control variables and their impact on the research model, meanwhile revisiting the CMV assessment.

The last chapter is Chapter 6 where research findings are discussed and compared with the literature. Concluding remarks support the research findings and justifications and explanations presented to consider why some results were not as proposed. The chapter also offers the implications of the current research results on theory, methodology, and practice and discusses both research limitations and proposed research directions for the future.

Chapter 2
Literature Review

The aim of this chapter is to review the literature on the important factors that help to identify and understand the motives for information technology adoption and, more specifically, for online selling adoption. It also demonstrates that the focus of the literature has been to study the impact of external business environments and product characteristics. Additionally, the literature lacks on addressing issues related to the impact of net-enablement capability – as an example of internal organizational capabilities – on the decision to adopt a technology, in particular online selling. To gain clearer insight, the literature of net-enablement and the associated strategic and competitive advantages was also reviewed.

Calls for research on the adoption and benefits of e-business began in the mid-1990s when commercial use of the Internet began to expand rapidly. For example, Bakos (1997) raised issues about the benefits sellers gain from adopting e-business and how firms use online data about customer preferences to produce customized products or services. According to Grewal et al. (2001) and Rask and Kragh (2004), the motives and challenges behind the decision of a firm to sell/buy online might be different across sectors and between buyers and sellers as they each have their own motives, challenges, characteristics, and common practices; this calls for further empirical investigation to determine such differences and their implications. For example, Stockdale and Standing (2002) addressed the need to study the specific motives for sellers when considering decisions related to participation in the online market as their actions are more challenging compared with those of online buyers.

The literature has explored many factors that might impact technology adoption and can help explain the differences seen in the adoption across sectors. Earlier research studies have pointed to a lack of managerial support (Boynton et al., 1994; Yap et al., 1992) and employee knowledge (Yap et al., 1992) in the general information technology context. More recent studies have identified firm's product characteristics (Bakker, 2000; OECD, 2001; Loane et al., 2004; Loane et al., 2007), deficiencies in the firm's online infrastructure (Loane et al., 2004), reluctance to change the current business model (John-Huggins, 2007), and associated costs as causes for eschewing the leap into online sales (Loane et al., 2007). They have researched whether the development of internal organizational processes affects e-business adoption (Debbie & Oliver, 2011; Marr & Yan, 2011) and whether the use of e-business tools, rather than traditional business tools, is associated with better outcomes (Zank & Vokurka, 2003). The literature also discusses security issues (John-Huggins, 2007; Boritz & No, 2005) and the lack of trust between users/clients, e-business systems, and partners (Allen et al., 2000).

Despite the amount of research available that relates to e-business and that addresses many different issues and promises, the adoption of online selling remains under-researched as evidenced by the concerns raised by many researchers (e.g., Rask & Kragh, 2004; Bryceson, 2011).

The annual survey of e-business adoption in Canada revealed significant differences among sectors for the adoption of online selling (Statistics Canada, 2007). The table "Enterprises that sell over the Internet" indicates how and the extent to which the private sector uses online selling options. From 2000 to 2007, total online sales for Canadian private sectors increased from CAD 5 billion to just more than CAD 58 billion, a significant increase in sales and growth in the importance of the online selling context for all sectors. As a proportion of all sales, however, online sales still constituted a

miniscule amount. Some firms in sectors with no significant push for adoption of online selling surprisingly used the online context to conduct their selling activity (see also Stennes et al., 2006). This raises the questions of why these firms decided to sell online and how these firms presumably utilized their internal organizational capabilities (i.e., net-enablement capability) to change their way of doing business, as there is no significant external push in their sectors.

The following sections review the literature on the current research concepts of information technology, e-business, and online selling. This review includes discussions related to the associated adoption as well as possible benefits and threats. The concepts are defined, and then they are introduced within the context of the literature on strategic and competitive advantages.

2.1 Advances in Information Technology

For more than four decades, information technology has addressed the need to process and to store vast amounts of data. In the 1950s and 1960s, the emphasis of information technology was on designing systems – such as management information systems, automated decision systems, and transaction processing systems – to both support management and improve the efficiency of business activities (Kling, 1980).

Between 1970 and 1980, researchers examined and evaluated the impact of the adoption of information technology and its associated systems on firm activities, operations, and decisions (Kling, 1980). Many firms changed in terms of how they accomplished activities and monitored and controlled their businesses due to technological changes (Kling, 1980). In the 1980s and early 1990s, information technology research focused on strategies for lowering business activity costs, achieving

higher quality products and services, and meeting customers' needs through customized and quick responses (Venkatraman, 1994). In the 2000s, the research emphasis shifted from addressing information technology in general to addressing issues related to the commercial use of the Internet, and e-business adoption in particular, as discussed in Section 2.2.

Advances in information technology may directly affect firms' short- and long-term planning to achieve certain business goals, and they also may produce economic value to the firms. Much of the literature was devoted to those two streams of research.

2.1.1 Strategic Advantages

According to Schon (1973), a firm is a learning system. Managers play a dominant role in both strategic development and the use of information technology solutions; their responses to environmental changes and to developments in information technology can range from full adoption to full rejection (Kreamer et al., 1989; Yap et al., 1992; Boynton et al., 1994). Whether firms adopt or ignore these technological advances, they learn from the outcomes of these decisions (Kreamer et al., 1989).

The adoption of information technology normally brings significant change to a firm's way of conducting business. As the changes become more sophisticated, it becomes difficult for their competitors to imitate them and to create strategic competitive advantages (Laugesen & Yuan, 2010). According to Venkatraman (1994) and Bryceson (2011), earlier information technology strategies visualized information technology as being useful for driving business and reducing costs by replacing current traditional business functions. More recent studies suggest that technology adoption

is gradually moving more toward supporting business activities rather than simply replacing business functions. Accordingly, the adoption of information technology has been strategically positioned to fulfill the purpose of establishing differentiation, pursuing opportunities, adding value to the business process, and creating customer value. These purposes imply establishing new channels of communication with customers and innovating new products/services; this would not have been possible without recent technological developments.

Carr (2003) and Straub (2003) noted that as the availability of information technology increased and its price decreased, the technology became commoditized and ceased to provide a competitive advantage. Further, rather than being an opportunity, information technology became a threat to some firms, because the cost of investment in it led to lower short-term profits. This apprehension about the negative consequences of substantial spending on technology investment may explain the reasons behind the recent shift in strategies related to the nature of the adoption, from completely replacing to merely supporting different business functions.

2.1.2 Adoption and Benefits

Economic and consumer needs are changing both nationally and worldwide. These changes are aligned with rapid advances in information technologies. This has pressured business leaders to continually adopt relevant technology to maintain business growth. Technology can also have its own benefits when selected, implemented, and used within the proper context and timing. These benefits include creating competitive advantages, establishing connectivity with other parties, and acquiring experience.

Adopting information technology can help develop many competitive advantages, including reducing costs, supporting management, enhancing strategic planning, increasing competitive market positioning (Boynton et al., 1994); improving systems communication, control, and reliability (Bostrom & Heinen, 1977; Boritz et al., 1999); building barriers to entry (Duhan et al., 2001); and opening channels with suppliers, customers, investors, and other intermediaries (Venkatraman, 1994; Boritz & No, 2005). In addition, studies point to the particular benefits of adopting certain technological advances such as networks, e-business, and the Internet. These benefits include integrating internal business units, connecting firms with their external business environments (e.g., Slater, 2000; Sawhney & Zabin, 2001); eliminating traditional business location barriers (Kobrin, 2001); and improving firm efficiency (Fletcher et al., 2004).

Another benefit of technology adoption is the enhancement of a firm's knowledge. Adopting new technology allows users (i.e., the firm's employees) to learn this technology and incorporate it, and follow its advances. This positions a firm to take advantage of future technological innovations with a shorter learning curve. Also, customers can use the same technology to establish their own networks, foster learning experiences and transfer knowledge between associated customers and then back to the firm (Dosi et al., 1988). This learning and knowledge is then reflected in the firm's products or services (a unique product or service or a new way of doing business) and further competitive market advantage and enhanced customer value (Schon, 1973; Knight & Cavusgil, 1996; Schlosser & McNaughton, 2007).

Firms should be cautioned about the level of resources used in order to adopt the information technology that will generate competitive advantage and performance improvement (Zhang & Lado, 2001). Accordingly, overextension in resources may threaten to lower short-term profits (Carr, 2003;

Straub, 2003). One can argue, however, that the effects of this threat can be mitigated by the potential benefits gained from proper adoption. These benefits can reduce the negative impact of technology adoption investment by reducing communication costs, exposing firms to new business opportunities, increasing market share, and reducing overhead (Oviatt & McDougall, 1994).

2.2 E-Business

One of the important outcomes of advancements in information technology is the development of the Internet and networking technologies that are the backbone of today's e-business or e-commerce (Porter, 2001; Boritz, 2003; Smith & Correa, 2005). Because this research concerns the adoption of a particular use of e-business – online selling– it is important to understand the definitions of e-commerce and e-business and related classifications. Online selling takes place in different contexts, forms, and sizes and also frequencies of orders.

Rayaport and Jaworski (2004, p. 495) define e-commerce as "technology-mediated exchanges between parties (individuals or organizations) and the electronically based intra- or inter-organizational activities that facilitate such exchanges". King et al. (2002, p. 881) define it as "business transactions that take place over telecommunications networks, a process of buying and selling products, services, and information over computer networks". E-business refers to "a broader definition of e-commerce, not just the buying and selling of goods and services, but also servicing customers, collaborating with business partners, and conducting electronic transactions within an organization" (King et al., 2002, p. 5). Even though e-commerce has a narrower meaning than that for e-business, the two are often used interchangeably.

2.2.1 Types

Two main classifications for e-business are widely used, based on user and pricing perspectives. From the user's perspective, e-business has two main categories: Business-to-Business (B2B) and Business-to-Consumer (B2C). B2B refers to business transactions, including e-business transactions, between firms; in particular, the term refers to a firm's supply chain members, intermediaries, and business customers (Trites et al., 2006). B2B also includes "purchasing and procurement, suppliers' management, inventory management, channel management, sales activities, payment management, and services and support" (Rayport & Jaworski, 2004, p. 4).

B2C, on the other hand, also called 'e-tailing' when done in an online context, refers to business transactions, including e-business transactions, conducted between firms and individual non-business customers (Trites et al., 2006). According to Rayport and Jaworski (2004, p. 4), B2C can include "the exchange of physical or digital products or services". One of the key characteristics of both B2B and B2C e-business, however, is the automation of business transactions between firms (B2B) and also between firms and non-business customers (B2C). This type of e-business also eliminates the role of intermediaries – called 'disintermediation' (Trites et al., 2006) – or creates a new type of intermediaries – called 'reintermediaries' (King et al., 2002).

In general, intermediaries provide services to firms, such as matching and providing market information and related consultations between buyers and sellers, as well as facilitating product selling activities and distribution of products to customers (King et al., 2002). Disintermediation occurs when the e-business limits the intermediaries' role by establishing direct channels for selling activities and online services between the firm and its customers through the firm's Web presence (Wigand, 1997; Jelassi & Leenen, 2003). 'Disintermediation' refers to "the removal of organizations

or business process layers responsible for certain intermediary steps in a given value chain" (King et al., 2002, p. 95). However, firms may use intermediaries to spotlight their products to online consumers, so these products stand out from the sea of other competing products, a process called 'reintermediation'. The role of reintermediaries can be to combine different products or services from many firms to provide total solutions to customers (King et al., 2002).

While the classification of e-business, based on user perspective (i.e., B2B and B2C), is widely used in the literature and in practice, this classification is not clear-cut, and overlaps others as suggested by Lusch and Vargo (2006). For example, is a single user who sells products/services from his/her home to customers considered a business? What is actually considered business? Is it the officially registered entity? What about others and how are they classified? However, this criticism does not affect the current research as it explores internal organizational capabilities and their association with the business model on innovation for online selling.

Another classification for e-business relates to the pricing perspective and is based on the traditional auction concept. An auction is a "market mechanism by which buyers make bids and sellers place offers… [until a] final price is reached," and auctions can be used in both offline and online contexts (King et al., 2002, p. 353). The primary goal of auctions is to achieve the maximum benefits for both suppliers and customers. While suppliers benefit by gaining the highest revenue available, customers benefit by acquiring the lowest price available (Trites et al., 2006). There are three main types of auctions – forward, reverse and double auctions – and the auction type depends on the type of product being sold.

A ‘forward auction’ refers to a marketplace in which there is one seller and many potential buyers and has three main types: the English auction, the Dutch auction, and the free-fall auction. In the English auction, sellers set the minimum price, bidders place their offers sequentially, and the highest bidder is the winner. This type of auction, conducted online, can take days. In an online Dutch auction, however, the seller sets a high price, which is decreased sequentially while bidders place their requested quantities for the posted price until the entire quantity is sold. This type of auction generally does not last long and is often used in the flower market. Finally, the free-fall auction is like the Dutch auction except only one item is auctioned at a time (King et al., 2002).

In the reverse auction, there is one buyer and many potential sellers. Buyers place an order, and sellers bid on the buyer’s order, reducing the price sequentially until the price hits its lowest point; the winner is the seller with the lowest bid. In a double auction, many buyers with orders and bidding prices are matched with many sellers with specified prices and quantities (King et al., 2002).

2.2.2 Statistical Facts and Impacts

The countries of North America and Western Europe, Australia and New Zealand are the largest adopters of e-business and use the Internet to conduct online commercial transactions. Policies, regulations, investments, and implementations in these countries protect and promote the e-business environment, and lead to a growing number of firms and customers who safely conduct e-business (Standing & Benson, 2000; Ferguson & Yen, 2007).

The commercial use of the Internet contributes to the overall economy with ever- increasing impact. To understand how large that contribution is, du Rausas et al. (2011) conducted a study to measure

the Internet impact on economy and growth using data from thirteen countries: Sweden, the United Kingdom, South Korea, Japan, the United States, Germany, India, France, Canada, China, Italy, Brazil, and Russia. The study revealed that online transactions in the countries studied contributed to 3.4% of their total GDP and 2.9% of the worldwide total GDP ($1,672 billion of value) in 2009. The same study and other statistical indictors show that Canada lags behind many other countries in its overall Internet transaction total including online sales, and this is the key point as this research concentrates on online selling in the Canadian market.

In 2009, for instance, the national GDP attributed to online transactions was 5.4% and 3.1% for the United Kingdom and France, respectively. The amount that online shoppers contributed to the domestic GDP was $63 billion (2.9%) for the United Kingdom and $35 billion (1.3%) for France. By 2015 online transactions are expected to comprise 10% and 5.5% of the national GDPs of the United Kingdom and France, respectively (Kalapesi, 2010; du Rausas et al., 2011). U.S. investment in Internet infrastructure was more than 25% of total technology investment in 2003 (Ferguson & Yen, 2007). While US online transactions comprised 3.8% of the national GDP in 2009, that total is expected to increase from $176 billion in 2010 to $279 billion in 2015, with a compounded annual growth rate of 10% (Evans et al., 2010).

On the other hand, Canadian online transactions constituted approximately 2.7% of the national GDP in 2009 (du Rausas et al., 2011). According to Ferguson and Yen (2007), Canada is about three years behind the United States in this aspect. Furthermore, recent studies by OECD (2010) and du Rausas et al. (2011) reveal that Canada also trails Sweden, the United Kingdom, South Korea, Japan, Germany, New Zealand, Australia, Ireland, France, and India in total online transaction contribution to national GDP. Also, these studies noticed that the most recent data available on Canadian online transactions

was from 2007. The Statistics Canada Website notes that many e-business-related surveys were discontinued after 2007, confirming earlier reported findings by OECD (2010) and du Rausas et al. (2011) of the difficulties in obtaining more up-to-date data.

Canada is described by Conklin and Trudeau (2000) as lagging behind many other developed countries; it is more risk-averse than the United States and other developed nations, especially in the area of e-business. Many Canadian firms wait for companies in other developed countries to implement new e-business ventures before following suit.

The statistical reports on the Internet's commercial impact on the economy and the increasing contribution of online transactions to national and worldwide GDPs suggest that the Internet is and will continue to be a key player in the world economy. As we face a very unstable economy, the numbers presented strongly suggest that future economic recovery may be based on e-business. Adopting e-business and its related tools of online selling may be essential to boosting business growth. According to Bryceson (2011), the adoption of e-business tools can help to provide innovative products and services quickly and affordably and to develop and maintain growth and competitiveness.

2.2.3 E-business Model Innovation and Motivating Factors for Adoption

The nature of and the extent to which e-business tools are incorporated to achieve firms' growth, goals, strategic, and competitive advantages is different among firms and largely attributed to innovation in firms' business models (Lee, 2005). Business model innovation refers to those reconfigurations in business strategies and operations that convert resources into business value

(Camponovo & Pigneur, 2003; Schilling, 2008). Firms will innovate different business models to suit their particular strategic business needs. Indeed, accommodating e-business in business models is a continual process that is developed in cumulative stages (Lee, 2005). During these stages, the degree of e-business adoption is based on the business process requirements achieved by reconfiguring organizational strategies and organizational resources (Wu et al., 2003).

Firms can be classified, based on their Internet presence, as firms with passive Internet presence and firms with an Internet presence that provides online selling activities (McNaughton, 2001). Establishing a passive Internet presence with information about the firms and contacts is an easy task that does not require many resources or reconfiguration of current business models. However, a firm's implementation of a sophisticated online presence to sell the firm's products or services online requires greater financial investment, resources allocation, reconfiguration and other organizational considerations. Indeed, according to Lee (2005), firms with multiple channels of communication with customers (i.e., physical store, telephone, Internet presence with online selling) will create customers that are more loyal. These loyal customers buy an average of 30% more products from firms with multiple communication channels than they do from traditional firms.

In addition, the literature points also to the differences among firms in the motivating factors that lead them to adopt e-business. According to Tetteh and Burn (2001) and Golovko and Valentini (2011), smaller firms visualize the adoption of e-business tools as a proxy to reach more markets and extend their current limited resources by utilizing the unlimited opportunities of the online market. The adoption of e-business can give smaller firms the tools to compete with larger firms, regardless of size, location and other barriers that smaller firms face.

Another motivating factor for e-business adoption is a business environment that encourages the adoption and utilization of different e-business tools. In sectors with higher e-business adoption rates that are not challenging for adoption, firm decisions to adopt e-business are affected by external players – government, competitors, suppliers, and changes in business and economic environments and customer behaviors (Rask & Kargh, 2004; Kioses et al., 2006). However, many other sectors with lower adoption rates are not pushing their firms toward adoption. The adoption decision in these sectors can be argued to be proactive, and the strategic decision is then based on a firm's internal organizational capabilities.

Many researchers suggest that internal organizational capabilities are a possible motivating factor (also called internal initiatives) for the adoption of e-business tools. To decide proactively to adopt e-business is a decision made to maintain growth as well as be ahead of other competitors. This motivating factor is under-researched in the literature, and needs further investigation to determine nature of these internal organizational capabilities in the context of adopting e-business tools (e.g., Wheeler, 2002; Williams, 2004; Standing et al, 2010; Bryceson, 2011). Subsequently, there is a scarcity of research on the outcomes of online selling adoption, specifically, the reconfigurations that occur in business strategies and operations to convert online selling into business value, also known as business model innovation. These issues are developed further in the following chapter as this research addresses those gaps in the literature.

2.2.4 Benefits

Today, e-business tools are becoming more affordable as technological and business advances drive down costs, and, consequently, the adoption process is being facilitated. The literature describes the

ways that the adoption of e-business currently benefits firms that may not have been able to afford it earlier. These benefits are from financial, marketing, and performance perspectives (Amit & Zott, 2001; Daniel & Grimshaw, 2002; Sambamurthy et al., 2003; Statistics Canada, 2006; Jeffrey & Hodge, 2007; Stair, 2011). From a financial perspective, e-business adoption increases profitability and lowers costs; it also connects and matches buyers and sellers at minimal cost. Further, this adoption (including strategic marketing positioning) provides a medium for advertising and brand building, reduces the limitations of products deemed unattractive to buyers in traditional retail stores, enhances customer satisfaction, establishes interactive (two-way) relationships with customers, and reaches more suppliers. In regards to company performance, the adoption of e-business can improve the quality and speed of communication, enhance information gathering, and improve business transactions.

Yi (2011) comments on the positive impact of e-business adoption on the natural environment, in order to complete the picture of e-business adoption benefits. According to Yi (2011), e-business adoption is a major factor in reducing global carbon emissions as it provides services and applications that reduce pollution-generating activities: business travel, transportation use and buying non-recyclable materials (such as CDs) are replaced by teleconferencing, online shopping and purchasing more eco-friendly goods and services (such as digital streaming), respectively. Porter (2001) notes that e-business adoption has led to the creation of new industries, markets, opportunities, and perspectives (e.g. online education, travel agencies, and pollution reduction). While not all business activities can obviously occur online, most companies should have an online presence to publish information about sales and to deliver their catalogues to customers (Fletcher et al., 2004).

According to Kioses et al. (2006), e-business adopters should be aware that e-business benefits cannot be generalized, and that not all such benefits will accrue because each firm will benefit from e-business adoption differently. Decisions regarding e-business adoption are not always easy because they can change a firm's structure and profitability; they can even become a source of business failure (Carr, 2003; Sambamurthy et al., 2003).

2.2.5 Challenges

Each firm's choice to adopt e-business is generally based on expected future competition, customer pressure, self- initiatives, and expected direct and indirect benefits to each business's core capability and overall profitability, as well as prior knowledge of customer patterns, market trends, technology advances and adoption, and of course business needs. However, many researchers argue that while adoption of e-business is expected to produce fruitful outcomes, it also has unique challenges. The failure to address these challenges can lead to possible failure of the adoption (e.g., Allen et al., 2000; Soto-Acosta & Merono-Cerdan, 2008). While this fear can explain why some firms are unable to achieve e-business value through an information technology investment, the issue also suggests a need for more investigation to uncover the best ways to deal with those challenges and achieve better e-business adoption.

Strategically, researchers have addressed digital networks as have great strategic advantage and being a tool to respond to a changing business environment (Sawhney & Zabin, 2001; Sambamurthy et al., 2003; Debbie & Oliver, 2011). Bakker (2000) and Standing et al. (2010) argue that the challenge is to shift internal network investments toward incorporating more Internet-related technologies. The Internet is much more open than a firm's own network and offers greater e-business strategic benefits

and solutions compared with local and closed internal networks or the Intranet. However, each decision needs managerial support as well as proper financial and other resources which may not be either affordable or easy to implement in all firms.

Another strategic challenge is that the adoption of e-business tools has shifted from simply replacing (i.e., taking over) traditional business activities to supporting them. According to Porter (2001) and Kioses et al. (2006) early failures resulted in some firms totally adopting e-business tools. Decision-makers should look to e-business tools as facilitating tools that add value to the business process. The adoption of e-business tools does not, by itself, create business value, while incorporating e-business tools and other resources as support tools for business functions and operations does.

Undertaking e-business strategies can produce channel conflict with current business functions and intermediaries for example, differences in incentives, rewards, policies, or support. While adoption may facilitate a particular activity, the process may lead to creating, changing, or losing opportunities with another activity (Porter, 2001; King et al., 2002). For example, online recruitment may reduce the cost of searching for qualified employees and yet create greater pressure on recruiting personnel to filter through the piles of résumés received online compared with those garnered from the traditional recruitment process.

Further, adopting e-business tools in one business activity can intensify the role of other business activities in the value chain; for example, online ordering shifts the business's emphasis toward both warehousing and shipping. Also, when firms seek the help of intermediaries to highlight their products or services, a new type of intermediaries, namely reintermediaries, is created, and a direct channel between firms and their customers may limit or eliminate the role of traditional

intermediaries (i.e., disintermediation). These issues necessitate a careful study of current business status and the possible changes and challenges that the adoption of e-business creates; otherwise firms "end up outweighing the up-front savings." (Porter, 2001, p. 76). As a consequence, firms may loose opportunities facilitated by e-business or not using them effectively.

From the customer's point of view, e-business also presents several challenges compared to traditional commerce activities (Porter, 2001; Johns, 2011):

- No physical experience with the product or service; customers cannot touch, see or smell products;
- No interaction with salespersons to gain more knowledge about the product or service;
- No face-to-face contact or human interaction;
- Delays due to shipments rather than instant physical pickup;
- Firms incur more costs, especially when customers request maintenance at customer sites.

These challenges can be resolved by strengthening other business activities, which is exactly what the Internet and e-business can help do. For example, to overcome the lack of face-to-face interaction, salespersons can provide customized opinions on the product and after-sales service via email or phone responses. Firms also found that these types of support for e-business activities helped increase employee productivity by tracking the number of interactions and cases discussed with customers (Porter, 2001; Johns, 2011).

From learning and knowledge perspectives, Brock and Boonstra (2003, p. 2) suggest that "many organizations started to use the Internet in quite ad-hoc and experimental ways. After [the] first stage

of learning and experimentation, there often arises a need for a more systematic approach to generate, order, and assess e-business options." Technology adoption is an ongoing learning process developed over time, and the adoption of e-business is no exception. Indeed, each cycle of adoption can enhance the following cycle (Sawhney & Zabin, 2001).

Further, Daghfous and Al-Nahas (2006) characterize decisions related to the adoption of e-business as being affected by great level of uncertainty when related information and knowledge are not properly collected. They suggest that firms resolve this challenge by first, building and auditing knowledge related to customers' buying patterns, technology trends, and previous cycle of technology adoption, supply chain trends, and competition, and second, by evaluating and auditing their core capabilities and how each core capability can benefit from adopting Internet technologies. Further, Bryceson (2011) argues that acquiring knowledge related to e-business adoption has a greater positive impact on smaller firms as it allows them, regardless of their limited resources, to compete with much larger firms.

From a practical perspective, researchers have uncovered many challenges that lead firms not to fully realize the feasibility of adopting e-business. Some of these barriers are 1) attachment to the current business model, 2) the issue of 'how to use' a technology, and 3) the issue of how to calculate the direct financial impact of e-business adoption.

Some firms do well using traditional commerce and do not see a need to develop e-business tools; these firms may be blinded by their current success and profits, however, and fail to see the opportunities from implementing e-business tools. Sawhney and Zabin (2001) suggest that firms lagging in technology should begin considering e-business opportunities by "cleaning the lens and

brooding [on] the field of view, [which] means wiping away the organizational myopia that often comes as a by-product of success, and rekindling the entrepreneurial spirit that helps the elephant remember how to dance." In the same context, Albert Einstein (n.d.) said: "In order to go somewhere else, we must think in a different way" (cited in Sawhney & Zabin, 2001, p. 106). That is, different business processes and activities only get better when people start seeing and doing them differently rather than being too attached to current business activities and achievements. Second, Jimenez-Zarco et al. (2011) found that the problem with technology adoption leads to the issue of 'how to use' the technology. In most unsuccessful e-business adoption, the e-business adoption was either not used properly or lacked employee cooperation to implement it well.

Third, the benefits associated with e-business adoption are qualitative, intangible, and often difficult to identify, which can lead to some firms arguing against the direct financial impact of such adoption (Soliman & Janz, 2004; Standing et al., 2010). Further, a firm may adopt online selling to increase its sales, but the actual gain might come from reducing costs and increasing customer satisfaction instead (Levenburg & Magal, 2005). That is, the impact is impossible to be measured precisely or isolated. This is particularly true when the financial contribution of the adoption merges with the impact of other technical, behavioral, organizational capabilities, and business processes of a firm as well as customer loyalty and satisfaction levels, which collectively attribute to an overall financial achievement.

2.3 Online Buying and Selling

Online buying and selling are nothing more than two tools or applications of e-business produced by advances in information technology. As such, they share the common characteristics and strategic

advantages discussed earlier in relation to e-business and information technology. This section describes the specific characteristics and factors attributed only to online buying and selling.

In general, the buying process has several components: Recognition of need, information search, purchase, and after-sale services (i.e., follow-up). Once customers realize their need for insurance, for example, they begin searching for different insurance providers, decide on the proper insurance to purchase, and then receive after-sale service (Neslin et al., 2006).

According to Dubinsky (1980), the selling process has seven components: Prospecting, pre-approach, approach, sales presentation, overcoming objections, closing the sale, and after-sale service. In other words, to sell your services or products, you need to identify your potential buyers, identify prospective buyers' needs and interests, conduct an initial contact with the prospective buyer, present the services or products that suit your prospective buyer, encourage the prospective buyer to purchase your offerings, reach an agreement, and finally provide your customer with after-sale service.

In the online context, according to Kioses et al. (2006), online markets have greater advantages for buyers than sellers. The primary difference between online buyers and sellers is that buyers are more proactive and oriented toward planning their purchase decisions (Rask & Kargh, 2004).

For their part, sellers are more driven by external forces (Rask & Kargh, 2004) and devote effort to planning the online launch of their products (Jeffrey & Hodge, 2007), as well as its suitability in the online context. Consequently, a seller's decision to use the Internet is based on sector push (Rask & Kargh, 2004) and product characteristics (Bakker, 2000; OECD, 2001; Loane et al., 2004; Loane et al., 2007). The common themes, specifically for online sellers, are addressing external forces that

pushed firms to adopting online selling as well as the suitability of the products/services for sale online. The literature lacks in addressing issues related to the impact of internal organizational capabilities on the adoption of online selling, and this research works to fill this gap.

2.3.1 Creation of Strategic Advantages

The online context can also create strategic advantages as suggested in related strategic literature. In the context of firm behavioral theories, decisions are characterized by each firm's approach to risk and uncertainty (Cyert & March, 1963). This uncertainty can arise from technical changes, customer pressure, and sector requirements. According to Cyert and March (1963, p. 119), a firm can avoid such uncertainty by "using decision rules emphasizing short-run reaction to short-run feedback rather than anticipation of long-run uncertain events" and by "arranging a negotiated environment [by introducing] plans, standard operating procedures, industry tradition, and uncertainty-absorbing contracts on that environment."

Further, Porter (1979) and Porter (2008) offer strategic approaches for firms, so they can identify benefits and threats. According to Porter (1979), firms in a competitive industry face five forces: 1) the threat of new entrants; 2) substitute products or services; 3) bargaining power of customers; 4) bargaining power of suppliers; and 5) firms' jockeying for a position among competitors. He suggests three strategic approaches to identify expected benefits and threats and position these firms more strategically in their industry. First, a firm should evaluate its current positioning by comparing its strengths and weaknesses to those of others in their industry. Second, a firm should seek balance by reducing the effect of industry forces and altering the sources of those forces. Third, a firm should exploit industry changes by being aware of current and imminent trends in the industry and the

possibility of integrating with other businesses, developing new business lines, or phasing out current business lines.

Many researchers apply these forces and the associated strategic approaches and comment on their continued validity and relevance from past commerce to current commerce (e.g., Anderson, 1988; Guthrie & Austin, 1996; Song et al., 2002; Rask & Kargh, 2004). Further, in a framework derived from Porter (1979), Rask and Kargh (2004) included four forces that firms can use to engage in online buying and selling: 1) efficiency: the visualization of online context as a medium to improve the quality of business activities; 2) positioning: the consideration of the online context as a mean to help in evaluation and comparison; 3) legitimacy: the visualization of the use of online context as associated with building norms and value through which a unique image can be built; and 4) exploration: the consideration of the online context as a medium that can help search for alternative or possible needs.

Porter’s (1979) three strategic approaches are generic in nature and need further contextualization to fit within the current research context of online selling and the associated innovation of business models. Although the four forces identified by Rask and Kargh (2004) are based on Porter strategic approaches, Rask and Kargh emphasize aspects more directly related to e-business environment. The emphasis of Rask and Kargh become very relevant to contextualize Porter's (1979) strategies toward online buying and selling and indicates that Porter's (1979) strategies are likely to remain valid for both current commerce and emergent online buying and selling. Rask and Kargh's (2004) forces of efficiency, positioning, legitimacy, and exploration are further discussed in the context of online buyers and sellers.

2.3.2 Online Buyers and Sellers' Forces

From the perspective of efficiency, buyers use the Internet to reduce the cost of obtaining goods, obtain the optimal price from all sellers, and compare products and service specifications at minimal cost (Uhrbach & Tol, 2004; Smart & Harrison, 2003). Additionally, buyers use the Internet to save time selecting products from physical store branches and get access to different sellers for comparison purposes (Sashi & O'Leary, 2002).

Similarly, sellers use e-business channels to reduce communication costs related to customers and distributors and allocate resources optimally among all sales channels (Sawhney & Zabin, 2001). Further, sellers use the Internet to increase access to customers and important decision-making authorities (Emiliani, 2000).

In terms of positioning, buyers use the online context to gain access to more sellers and reduce the bargaining power of sellers and increase the competitiveness of buyers. Further, buyers are generally proactive in their decisions to buy online, when they are more oriented toward planning their purchase decisions. Online buying also involves considerably less organizational and technical investments than it does for sellers (Eng, 2004).

Sellers also use online channels to position effectively since those online channels offer rich access to the marketplace and competitor prices (Emiliani, 2000). This access can help sellers evaluate their pricing strategies more effectively, use e-business channels to reduce inventory costs (Eng, 2004), and reach more customers and key distributors to strengthen their bargaining power (Fischer & Reuber, 2011). Still, sellers are generally characterized as followers in the online context because they are driven primarily by external forces; their decision to use the Internet to sell their products or

services is usually based on sector push; and their decision to use the online context is normally challenged by the characteristics of their products, technical requirements, and business resources (Rask & Kargh, 2004; Eng, 2004).

In terms of legitimacy, buyers wish to maintain their legitimacy by being seen as proactive in their decisions (Rask & Kargh, 2004), so they may want to promote a positive image by being e-business adopters or even early adopters, as opposed to laggers. Despite sellers' initial reluctance, online selling options do enhance their legitimacy; like buyers, sellers can utilize online options to present a positive image within their sector and their customers by being e-business adopters or even early adopters, as opposed to laggers (Grewal et al., 2001).

In terms of exploration, some online buyers want to promote a learning experience, so they build information technology capabilities that relate to e-business when needed. Similarly, online sellers can use the online context to build a learning experience and build information technology capabilities related to e-business (Grewal et al., 2001; Rask & Kargh, 2004). Indeed, this "try out" experience can be developed as a way to present the seller as an online innovator by customizing the ways to sell that firm's products in the online context (Statistics Canada, 2006; Fischer & Reuber, 2011).

Table 2.1 summarizes all the similarities and differences between online buyers and sellers based on Rask and Kargh's (2004) forces to engage in online buying and selling. These forces aim to identify expected benefits and threats to reduce business environment uncertainty.

Forces	Online Buyers	Online Sellers
Efficiency	• Cost reduction • Price comparison • Time saving • More access (Uhrbach & Tol, 2004; Smart & Harrison, 2003; Sashi & O'Leary, 2002)	• Cost reduction • Price comparison • More access (Emiliani, 2000; Sawhney & Zabin, 2001)
Positioning	• Enhance bargaining power • Increase competitiveness • Be proactive • Require less investment and requirements (Eng, 2004)	• Enhance bargaining power • Offer self -assessment • Deliver price comparison • Increase competitiveness • Be proactive • Require more investment and other requirements (Emiliani, 2000; Rask & Kargh, 2004; Fischer & Reuber, 2011; Eng, 2004)
Legitimacy	• Positive image • Proactive (Rask & Kargh, 2004)	• Positive image • Proactive (Grewal et al., 2001)
Exploration	• Promote learning experience (Grewal et al., 2001; Rask & Kargh, 2004)	• Promote learning experience • Be innovator (Grewal et al., 2001; Rask & Kargh, 2004; Fischer & Reuber, 2011; Statistics Canada, 2006)

Table 2.1: Mapping of Rask and Kargh's (2004) forces' impacting online buyers and sellers.

2.3.3 Strategic Advantages of Online Selling

Online selling is an example of the advances in information technology as well as illustrating one of several e-business tools. As such and based on Porter (1979), Porter (2008), and Rask and Kargh

(2004) and their arguments for how firms create strategic advantages, online selling can indeed create strategic advantages for firms.

Websites can generally be classified as image-building (passive, informative web sites), sales assistance, or integrated sites (McNaughton, 2001). According to Stennes et al. (2006), when adopting online selling tools, it is first necessary to launch a passive web site that provides information about the firm, its products, and its services, followed by development of e-communication channels with customers and suppliers. Consequently, this process should assist and enhance or replace traditional sales channels as well as possibly integrating with suppliers and customers. With these two steps in place, firms are ready to implement their strategies for selling online.

The adoption of online selling can create competitive and strategic advantages for the online sellers for four reasons. First, the activity of online selling takes place over digital networks which are a source of strategic advantage as suggested by many researchers (e.g., Sambamurthy et al., 2003; Johns, 2011; Debbie & Oliver, 2011). That is, the adoption of online selling creates an opportunity to reach customers, connect with suppliers, and create a value proposition. Second, proactive online sellers, especially in sectors with infrequent use of online selling, can enjoy the competitive advantage of being first movers (i.e., innovators) and make it difficult for others to imitate them, a strategic advantage. Third, the use of online selling can create a customized means of communication with customers and suppliers, providing a strategic advantage by leading in the use of online selling tools and its associated learning process (Johns, 2011). Fourth, According to Bryceson (2011), the Internet can provide innovative products/services at a convenient time and price, driving forces that can help develop and maintain competitiveness.

2.4 Summary

The adoption of e-business changes the way firms do business by creating new advantages, threats, and challenges that are not part of the traditional business and commercial environment. While buyers tend to be more proactive in adopting e-business solutions – at least in part because doing so involves considerably less investment than it does for sellers – sellers' decisions to invest in e-business activities are normally limited by the characteristics of their products and their business resources. Consequently, online buying is more common than online selling, as the online environment offers relatively greater advantages to buyers than to sellers.

The literature does not address fully the issues related to the internal organizational capabilities of firms that adopt online selling. While the literature argues that innovation in a business model is a necessity when a technology is adopted, it does not address the innovation taking place in business models when online selling is adopted. In addition, an increasing number of firms across all sectors have found ways to sell online to expand and enhance their business activities, while many others are choosing not to sell online. It is interesting to uncover those internal organizational factors that contribute to the decision to select and implement online selling and also uncover the specific changes and reconfigurations that online sellers use in their business models to be able to utilize their adoption of online selling most effectively.

Chapter 3
The Theoretical Background

The main goal of this study is to identify the net-enablement capability (i.e., internal organizational capability) for online selling and its associated innovation in business models, including identifying and assessing the associated relationships. This is to help in understanding the process of selecting and implementing a technology based on the net-enablement capability of firms. The research uses the Net-Enabled Business Innovation Cycle (NEBIC) model and its related theories of dynamic capability and absorptive capacity and develops a construct to measure business model innovation in the context of online selling.

This chapter begins with a review of the alternative theories that explain the general adoption of information technology, followed by a discussion of the dynamic capability and absorptive capacity theories (both are antecedents of the NEBIC theory). It explains how both inform Wheeler's theory of net-enablement and, consequently, relate to the current research model. Then, a review of Wheeler's NEBIC theory is presented. The chapter concludes with a detailed description of the research model and the hypotheses based on NEBIC and its underlying theories.

3.1 Alternative Theories of Information Technology Adoption

The relevance of particular theories that are widely applied in the information technology adoption literature to current research is vitally important. These theories are the technology acceptance model (TAM), the diffusion of innovation (DOI), and the resource-based view of the firm (RBV). Dynamic

capability and absorptive capacity theories are discussed in much more detail as they were utilized within the current research model.

The technology acceptance model (TAM) is a theory that describes how users accept and use information technology (Davis, 1989). The model associates the attitude and intention of users to use a certain technology with two preceding factors, namely, perceived ease-of-use and perceived usefulness of the technology. This model is one of the most influential theories in the information systems field and has undergone several developments in the past two decades (Parker & Castleman, 2009). The TAM model discusses the customer point-of-view and attitude toward the use of a technology, while the current study examines internal organizational capabilities of a firm for adopting online selling tools and the associated innovation of the specific business models needed to accommodate such tools. Consequently, this model seems not to be relevant to the current research context.

The second theory is diffusion of innovation (DOI). According to Rogers (2003) it describes the relationship between members of a social system and innovation adoption. He posits that the decision to adopt a technology innovation is based on relative advantage, compatibility, trial-ability, observe-ability, and simplicity of the technology. He articulates that the process of DOI follows certain steps: Knowledge to gain initial interest and awareness about the innovation; persuasion to gain detailed information about the innovation; decision, to decide whether to implement or reject the adoption of the innovation; implementation to adopt the innovation gradually; and confirmation to fully adopt the innovation. From the perspective of adopting technologies over time, the process follows an S-shaped curve where adopters can be classified as innovators, early adopters, early majority, late majority, and laggards.

In addition to being widely accepted and used in the literature (Parker & Castleman, 2009), the DOI theory addresses important issues that relate to innovation adoption and social network effects. Thus, the theory sounds promising for use within the current research context. However, according to Attewell (1992), the theory does not address the fact that the adoption process is an ongoing learning process wherein each adoption cycle informs the following cycle. Also, the theory emphasizes the impact of social networks on adoption while ignoring the impact of other networks, such as digital networks. Specifically, the theory lacks in terms of addressing the impact of internal net-enablement capability on technology adoption. It also fails to address innovations in business models, including innovation in products/services and business activities that are needed to fully utilize the adopted technology. As this study concerns the adoption of online selling and the associated innovations in business models, based on the level of development in each firm's net-enablement capability, the DOI theory seems not to be relevant to this research.

The third theory is the resource-based view of the firm (RBV). Here, Wernerfelt (1984) associates the use and different combinations of a firm's rare and valuable resources (i.e., internal and/or external) as a prerequisite for the achievement of competitive and strategic advantage. He posits that the unique use of a firm's resources, such as competencies, assets, know-how, and capabilities, can lead to a specific combination of these that is difficult for others to imitate, and thus leading the firm to achieve competitive and strategic advantages. According to Parker and Castleman (2009), the RBV theory seems relevant to e-business- related research, as it does address tangible and intangible resources, including e-business tools.

While empirical studies strongly support this theory, many researchers criticize it. Their questions and criticisms include the following: 1) Do affordable and cheap resources create advantages? 2) Is it possible for a resource to be used as a supportive tool for business activities rather than as a replacement as originally theorized, in order to create advantages? 3) The theory is not capable of explaining an e-business adoption decision when the adoption decision is mainly derived from external factors; 4) It is vague and tautological (e.g., Priem & Butler, 2001; Ray & Ray, 2006; Parker & Castleman, 2009); and 5) The theory does not address the changes in the current resources associated with the adoption of a new technology. Consequently, the RBV theory does not seem applicable to the current research context.

The fourth theory is dynamic capability, and it was introduced by Teece et al. (1997) in response to the criticisms raised against the RBV theory. Dynamic capability is the ability of a firm to respond to the changing environment. The extent of this response is based on the development, integration, reallocation, and reconfiguration of the company's internal and external competencies. To overcome the shortcomings of the RBV theory, dynamic capability emphasizes the development of a firm's resources in a cyclical process rather than the use of existing rare resources which RBV posits. In addition, according to Wade and Hulland (2004), the RBV hypothesized that the creation of strategic competitive advantages is based on the unique use of a firm's rare resources may not applicable to many firms. The dynamic capability posit that better firm positioning is based on the ongoing development of firm resources is pertinent to many companies.

The dynamic capability theory addresses the internal factors that firms, across a wide spectrum of levels and types of resources, can leverage for better positioning in a business environment. Thus, this

theory seems very relevant to the current research question. It is discussed in detail with its associated strengths and criticisms as it is used in the current research model.

The fifth theory is absorptive capacity. It is defined as a firm's ability to gather, use, and implement new information technology to produce commercial value (Cohen & Levinthal, 1990). The theory is based on two prerequisites – prior-related knowledge and communication. In addition, it offers cumulative and continual development of both related knowledge and communication in a cyclical format (Cohen & Levinthal, 1990). From the current research perspective, absorptive capacity seems to have great value as it addresses issues related to the internal context of a firm – the learning and communication impact on organizational development. It is discussed in detail in Section 3.3.

3.2 Dynamic Capabilities

Teece et al. (1997) and Eisenhardt and Martin (2000) assert that the dynamic capability approach is a tool for identifying opportunities to achieve competitive advantage. They emphasize two factors – 'dynamic', a firm's capacity to cope with its changing business environment, e.g., implementing innovative, well-timed technological responses; and 'capabilities', strategic actions aimed at integrating and reconfiguring internal and external organizational resources and competencies. The dynamic capability approach can help firms reduce the impact of various types of uncertainty and associated risk by their being better informed about the business environment and ready for change. These changes are characterized as an ongoing development process for different firm resources.

A capability consists of processes (also called routines or dimensions). These processes, or routines, are the mediums through which firms maintain connections with both external partners and internal

business units to communicate with suppliers, gather information, acquire knowledge, engage in distribution, and more (Teece et al., 2002). According to Teece et al. (2002, p.89), these processes are "how tasks are accomplished, how problems are solved, and how knowledge is learned, and are not tangibly identifiable or necessarily codified". They represent a "firm's patterns of current practice and its organizational learning" (p. 90). Processes accommodate aspects of information gathering and processing, innovation and problem solving, relationships with suppliers, and organizational learning. Each process can be broken down into detailed routines – also called simple tasks or items (Wheeler, 2002; Williams, 2004). According to Teece et al. (1997), firms need three dynamic capabilities to achieve a competitive advantage:

- Organizational and managerial process – current routines, practice, and learning. This capability has three roles: 1) coordination/integration, 2) learning, and 3) reconfiguration.
- Position – a firm's current technology, intellectual property, complementary assets, customer base, and relationship with external parties. This capability has seven aspects: 1) technological, 2) complementary, 3) financial, 4) reputational, 5) structural, 6) institutional, and 7) market.
- Paths – a firm's available strategic alternatives, including its technological opportunities.

Simply put, dynamic capabilities represent a firm's ability to use its different resources (i.e., organizational, managerial, technical) to create a competitive advantage within its market by introducing innovative responses to a changing business environment. Further, the interaction between a firm and its business environment is an important dimension of the dynamic capabilities theory. Teece et al. (1997) asserts that a firm's effective and unique use of its resources, including the effective use of inter-organizational relationships to screen market opportunities and threats, can

create a difficult-to-imitate advantage over other firms. Further, the effective use of inter-organizational networks can help a firm sense business changes and respond accordingly using the firm's resources (Eisenhardt & Martin, 2000).

Many scholars have argued that the dynamic capability theory is vague and tautological (Wang & Ahmed, 2007). This is a critical issue, and while the theory remains very helpful when addressing how to respond to the business changing environment, it fails to describe exactly how. Further, Lawson and Samson (2001) suggest that the capabilities of the theory are difficult to identify and/or operationalize, and in some cases, those very capabilities can lead to a core capability becoming core rigidity. As such, the use of the theory in its current state for this research is difficult without being able to further specify, develop, and identify those capabilities.

Zahra et al. (2006) proposed a revision of dynamic capabilities, defining them as "the abilities to reconfigure a firm's resources and routines in the manner envisioned and deemed appropriate by the firm's principal decision makers" (p. 924), and emphasized two differences with Teece et al.'s (1997) definition. First, the firm's ability to "reconfigure" is desirable, regardless of the firm's financial performance, and second, the manager's role is central to enhancing and directing that firm's capabilities. This revision could be very helpful in addressing smaller firms where a manager's role is focal.

To further clarify concepts related to the dynamic capability theory, Wheeler (2002) introduced an application derived from the dynamic capability theory for net-enablement. Wheeler's NEBIC facilitates understanding and predicting how firms transform capabilities associated with net-enablement into customer value using the dynamic capability theory (Wheeler, 2002). These net-

enabled firms are able to “continually reconfigure their internal and external resources to employ digital networks to exploit business opportunities” through their “routines, knowledge, analysis and rules to create customer value from their net-enablement capability” (p. 128).

Thus, for the purposes of this research, the dynamic capability theory is promising; it addresses issues related to internal organizational capabilities and the innovative use and implementation of technologies to maintain business growth. However, the theory does need further development to address the relevant criticisms regarding the level of operationalization in order to be used in the current research context. Indeed, Wheeler's theory of net-enablement suggests a very helpful theoretical framework for the further development and accommodation of the dynamic capability theory and for increasing the dynamic capability strength while resolving its shortcomings.

3.3 Absorptive Capacity

Cohen and Levinthal (1990, p. 128) define absorptive capacity as “the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends, [which] is critical to its innovative capabilities.” A firm’s innovative capability and its ability to evaluate and to use outside knowledge are mainly functions of that firm’s prior related knowledge and the communication of related information to all concerned parties. Therefore, prior knowledge, communication, practices, and experience create the necessary foundation for the assimilation, selection, and implementation of profitable business operations. This prior knowledge indirectly includes the cost and the direction of future business opportunities that the firm is seeking. Employees in various areas of the firm become the firm’s main information repository (Zahra & George, 2002b; Lenox & King, 2004).

According to Cohen and Levinthal (1990, pp. 131-32), a firm's absorptive capacity depends on that firm's structure of "communication between the external environment and the organization, as well as among the subunits of the organization" to support operational or strategic activities. This structure includes individual members as noted by Cohen and Levinthal (1990) in that "absorptive capacity will depend on the absorptive capacities of its individual members". The development of individual members' capacities tends to be cumulative and eventually extends to corporate capability. Overall, absorptive capacity includes the "acquisition of information by an organization" in terms of appropriate innovation and "the ability to exploit it".

Although absorptive capacity theory is widely noted in the literature, Zahra and George (2002b) argue that the concept has a too broad definition as well as no clear dimensions or scales, evidenced by the variations among different studies that have used the absorptive capacity theory. Bosch et al. (1999) contend that absorptive capacity should not be based only on prior related knowledge, as Cohen and Levinthal (1990) originally proposed, but rather, organizational culture and combinative capabilities should be considered as antecedents to a firm's absorptive capacity. For example, a business culture that appreciates and supports continued learning has a higher absorptive capacity than other business cultures that do not support individual learning and development.

From the current research perspective, absorptive capacity theory address issues related to internal organizational capabilities, learning development capability, and the importance of communication to share information. However, the theory needs further development to be able to address the relevant criticisms related to scale development and inclusion of firm culture. Thus, the current research model

which is based on NEBIC theory accommodates parts of absorptive capacity as well as the relevant and suggested inclusion of a culture impact.

3.4 Net-Enabled Business Innovation Cycle (NEBIC)

Generally, a network ("net") includes "social systems, organizations, individuals and groups, entire industries, and political and social communities" (Wigand, 1997, pp. 11-12). Networks like social and user networks help participants share knowledge, experiences, and ideas (Schon, 1973; Dosi et al., 1988; McNaughton & Bell, 2001); the innovative use of networks connected through information technologies is referred to as "net-enablement". Within the context of NEBIC, net-enablement capability can "reduce barriers of time and distance, substitute information for physical process, and engage in innovation that aligns the firm to its competitive environment" (Wheeler, 2002, p. 126). Net-enablement includes connections with suppliers, customers, and alliance partners.

Wheeler's (2002) NEBIC theory associates net-enablement with creating customer value and postulates a feedback loop that enhances future technology choices. Specifically, the theory posits that the successful implementation of technology innovation to maintain business growth is associated with better-developed net-enablement capability. Wheeler (2005, p. 6) defines NEBIC as "a view of requisite capabilities and their interactions to proactively realize business value in an age of unending IT change". That is, firms use and develop their net-enablement capability to enhance the process of identifying, selecting, and implementing new information technology and consequently create customer value to maintain business growth and competitiveness. The NEBIC theory is a cyclic model with four simple capabilities for net-enablement: 1) choosing emerging/enabling technologies (ET); 2) matching proposed technologies with economic opportunities (EO); 3)

executing business innovation for growth (BI); and 4) assessing customer/client value (CV). When these capabilities are combined with business routines in sequenced steps, the firm has a cycle of net-enabled dynamic capability that creates customer value by implementing innovative technologies (Wheeler, 2002). Figure 3.1 illustrates the NEBIC theory.

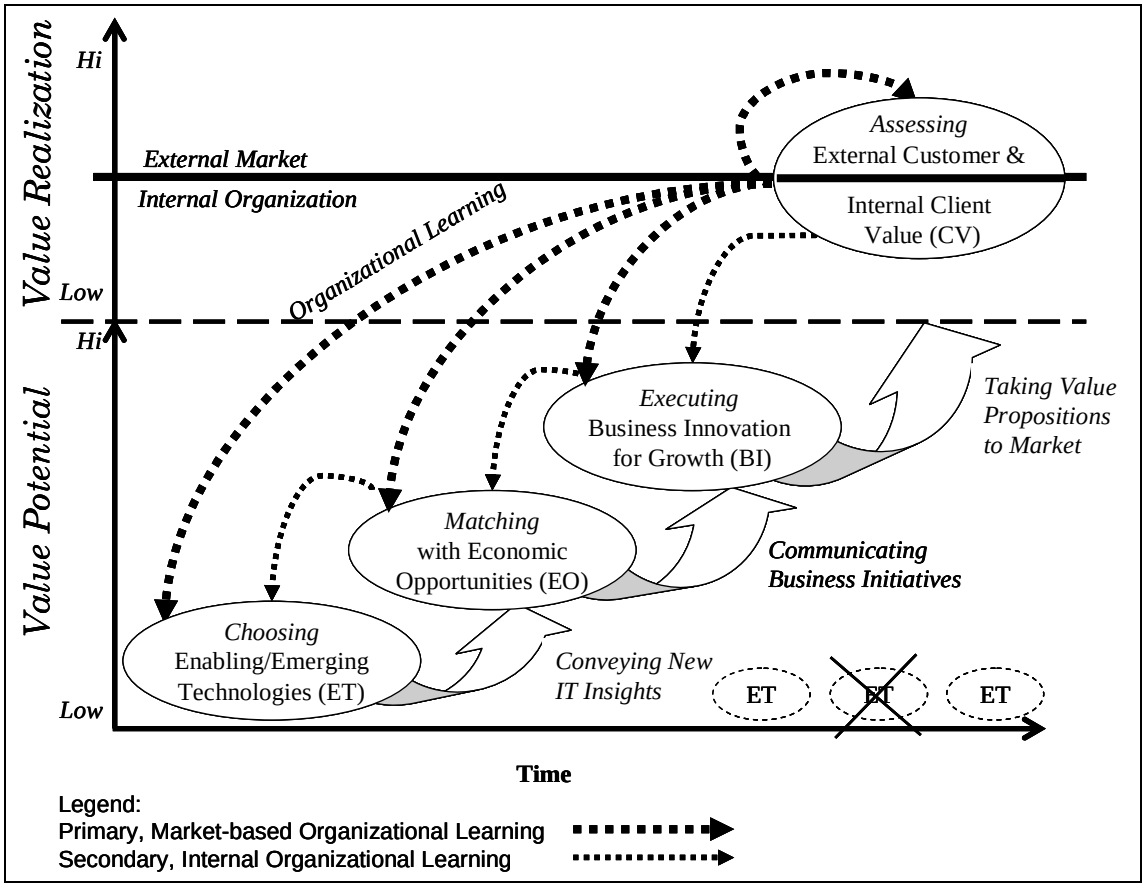


Figure 3.1: Net-enabled Business Innovation Cycle (Wheeler, 2002, p. 131)

Theoretically, NEBIC addresses parts of both the dynamic capability and absorptive capacity theories. From a dynamic capability theory perspective: the NEBIC theory addresses the ability of firms to use their net-enablement capability to maintain continual business growth and competitive advantage through identifying, selecting, and implementing new information technologies (i.e.,

creating new channels using digital networks to reach customers with new digitized products or services in addition to using traditional channels). Also, the NEBIC theory accommodates concepts that relate to a firm's ability to maintain continued interactions with both internal and external parties and respond to the changing business environment. These interactions increase firm efficiency, ensure a prompt response to internal and external environmental changes, and enhance internal organizational learning; both internal-based and market-based feedback is thus amplified. NEBIC theory emphasizes maintaining the ongoing transformation process of information technology to create customer value. Over time, this process should be enhanced by accumulated learning feedback acquired from previous information technology implementation (Wheeler, 2002).

From the absorptive capacity theory perspective, Wheeler (2002) notes that a firm's absorptive capacity (developed through prior related knowledge) affects its "ability to recognize and begin assimilating new technologies" (p. 128). That is, high absorptive capacity supports a firm's strategic plans for new information technology implementation and the creation of business innovation for growth. Low absorptive capacity, however, can hinder a firm's ability to recognize new information technology opportunities and limit that firm's investment in strategic options to respond to the changing environment. Additionally, the current level of absorptive capacity of a firm can be extended by net-enablement capability through exposure to other digital networks and information technology knowledge resources.

Strategically, with the NEBIC theory, a firm's participation in networks and its associated participation with customers, suppliers, and partners, has significant impact (Wheeler, 2002). The literature addresses the many advantages of net-enablement capability, such as strategically improving firm competitiveness, enhancing a firm's agility to cope with external changes, achieving a

lead in potential business innovation, achieving the economic purposes of the firm, and increasing the complementarity of sustainable resources, particularly when an intranet of a firm is integrated with other information technologies and networks (Zhu & Kraemer, 2002; Sambamurthy et al., 2003; Standing et al., 2010).

From a business operations perspective, many authors acknowledge the importance of a firm's net-enablement capability and its helpful effect on operations (e.g., Bakker, 2000; Sawhney & Zabin, 2001; Sambamurthy et al., 2003; Debbie & Oliver, 2011; Standing et al., 2010). They observed that the use of digital networks has a positive impact on a firm's ability to exploit information related to changes in the market and the business environment and thus improve business performance. Net-enabled firms can benefit by collecting, synthesizing, and distributing information both within and outside their firms. Researchers do suggest that net-enabled firms can use their digital networks to solve practical business problems, enhance efficiency level, and managing and establishing new markets to maximize profit.

From organizational learning perspective, Knight and Cavusgil (1996) asserted that net-enabled firms are proactive players in an international context and do benefit from net-enablement-associated learning. The literature also identifies other benefits, including enhancing information delivery to customers, lowering costs of integration (Slater, 2000), optimizing human resource management, enhancing a supply chain (Ende & Wei, 2007), and facilitating and improving a firm's products and services (Windrum & Berranger, 2003).

Several researchers have commented on the face validity of Wheeler's NEBIC theory (e.g., Zahra & George, 2002a; Straub, 2003; Saeed et al., 2005; Bendoly, 2007; Tarafdar & Gordon, 2007;

Patrakosol & Lee, 2009; Yoo et al, 2010). While some parts of the theory have been empirically tested (Williams, 2004), a number of its hypotheses, capabilities, and dimensions remain untested (e.g., Zahra & George, 2002a; Wheeler, 2002; Williams, 2004; Dow, Hackbarth & Wong, 2006; Soto-Acosta & Merono-Cerdan, 2008).

In the context of the current research, the NEBIC model addresses internal organizational capability (i.e. net-enablement) and associates its development with the successful selection of technological innovation to create customer value and to maintain business growth. While the model certainly has constructs, it has no scales to measure them and its validity is not confirmed. Further, NEBIC does not address the association between technology adoption and required innovation in business models. As such, while the conceptual model of NEBIC appears to be very relevant to the current research context, it needs further identification and development to address its shortcomings in order to achieve the current objectives. These issues are addressed in the current research in the context of online selling.

3.5 Research Model and the Hypotheses

The main thesis for this research model is that the successful implementation of online selling as an innovation for business growth is based on well-developed net-enablement capability. It posits that online selling implementation is associated with innovation in the business model to accommodate the new requirements of adopting online selling within the business environment. For this purpose, the research model and the applied theoretical framework of NEBIC, dynamic capability and absorptive capacity are discussed, followed by a detailed description of each construct of the model and associated hypotheses.

The current research model develops a construct (i.e., the model dependent variable) to measure business model innovation for online selling (BMIOS) and to address issues related to innovation in business models that are needed to utilize the benefits of the adopted online selling tools. This construct is an extension of the NEBIC theoretical model to overcome failure in addressing business model innovation resulted from technology adoption. The innovation targeted for the dependent construct of BMIOS is one that establishes the use of online selling and reconfigures business resources accordingly. According to many researchers (e.g., Schon, 1967; Teece et al., 1997; Suchman & Bishop, 2000; King et al., 2002), once a firm implements a new technological application (online selling in this research context), a new business model is created. Thus, business model innovation can be viewed as a firm's ability to convert technological innovation into customer value. The business model becomes the mediator between the new technology adopted and the value created by changing the current business configuration (Chesbrough & Rosenbloom, 2002).

As described earlier in the NEBIC section, each new selection of information technology begins a new business cycle of the NEBIC theory by applying its four capabilities: 1) choosing emerging/enabling technologies (ET); 2) matching proposed technologies to economic opportunities (EO); 3) executing business innovation for growth (BI); and 4) assessing customer/client value (CV). Indeed, NEBIC posits that superior net-enablement capability, when executing information technology for business growth, has a positive impact on information technology selection and implementation (Wheeler, 2002). That is, the successful implementation of technology innovation to maintain business growth is associated with a better developed net-enablement capability. In this research context, online selling is an example of information technology used to maintain business growth.

This research accommodates three capabilities of the NEBIC theory (i.e., ET, EO, and BI) as they describe internal organizational capability. However, the fourth capability of the NEBIC theory, which assesses customer/client value (CV) capability, requires collecting data directly from customers located at a different level of value recognition (i.e., value realization) as proposed in the NEBIC theoretical model (see Figure 3.1). Thus, the measurement of assessing customer/client value (CV) in the current research model is excluded, and the data for this study was only collected from firms.

Consequently, the model for this research has three constructs to assess the net-enablement capability and a single construct to assess innovations in the business models of firms that accommodated online selling. The model constructs for net-enablement capability are: 1) choosing enabling technologies (CET); 2) matching proposed technologies with economic opportunities (MEO); and 3) executing information technology as business innovation for growth (EITBIG). The ultimate dependent variable is the business model innovation for online sellers (BMIOS).

NEBIC is a cyclic theory that associates the successful implementation of technology innovation to maintain business growth with a better-developed net-enablement capability (Wheeler, 2002). However, the current research model addresses just one cycle of the NEBIC. This cycle represents the latest information technology implemented by net-enabled firms, regardless of whether it is online selling or other technologies. To assess the prediction power of the research model, the model further differentiates between online sellers and non-online sellers based on the type of latest technology implemented. The assumption is that online selling is an example of technology innovation, as its tools are readily available in the market, and yet the implementation of online selling is new to many

firms and thus not widely spread across different sectors. As such, the research model posits that firms that implement online selling, as a technology innovation, are likely to have better developed net-enablement capability based on the NEBIC model. However, non-online sellers are likely to have relatively less developed net-enablement capability.

> *H_1: Online selling is positively associated with the level of net-enablement capability development.*

In addition to NEBIC, the current research model has operationalized concepts related to dynamic capability and absorptive capacity theories as supportive theories. From a dynamic capability theory perspective, the research model measures a firm's ability to continuously reconfigure different types of resources to cope with the changing business environment. This ability helps firms realize the benefits gained from possible business opportunities or prevent possible business threats. Further, maintaining business growth by the information technology identification and possible implementation is a crucial dynamic capability aspect of the current research model. Actions taken by online sellers to accommodate online selling are also addressed in the model to assess firm capacity and strategic actions taken to adopt online selling as a technology innovation with its own opportunities, threats, and requirements.

From the absorptive capacity perspective, issues related to firm prior knowledge, organizational learning, and the existence of a supportive culture for change are also accommodated in the current model. Aspects of information exchange with both internal and external parties are also presented. Further, outcome actions toward implementing online selling are assessed to test the impact of prior knowledge (i.e., employee training, supportive culture for change, and information communication)

on technology implementation. See Table 3.1 for a summary of the theories used in this regard and their contributions to the research model.

Theory	Key Issues	Criticism	Aspects Used in Research Model
Dynamic Capability	• Opportunities identification • Using firm resources • Effectively responding to the changing environment based on firm resources and their associated alteration. (Teece et al., 1997; Eisenhardt & Martin, 2000)	• Vague • Difficult to identify • Possibility of a core capability becoming a core rigidity (Wang & Ahmed, 2007; Lawson and Samson, 2001)	• Maintenance of business growth by IT identification • Instant interaction with both internal and external parties for proper implementation • Ongoing reconfiguration of firm resources to accommodate business changes
Absorptive Capacity	• Collecting new information/knowledge • Assimilating/absorbing it • Applying it to benefit the firm (Cohen & Levinthal, 1990)	• Managerial practices • Firm structure • Individual knowledge and training (Bosch et al., 1999; Zahra & George, 2002b; Lenox & King, 2004)	• Information communication • Organizational learning •Supportive culture for change
Net-Enabled Business Innovation Cycle (NEBIC)	• Use of digital networks • Identify IT opportunities to maintain continual business growth • Use a cycle of choosing, matching, executing IT, and assessing customer value • Communication as essential (Wheeler, 2002)	• Many hypotheses and capabilities not tested (Zahra & George, 2002a; Wheeler, 2002; Williams, 2004; Dow, Hackbarth, & Wong, 2006)	• Use of the Internet • Identifying online selling as a possible business opportunity for growth • Information communication • Only constructs of choosing, matching, and executing adopted

Table 3.1: Summary of theories used and their association with the research model.

3.5.1 Choosing Enabling Technology (CET)

CET is the first construct of this research model and describes the *activity* of choosing one or more enabling information technologies for possible adoption. The NEBIC theory differentiates between emerging and enabling information technology. While emerging information technology represents technologies under development, enabling information technology refers to those already commercially available (Wheeler, 2002). In the current research model, the CET construct uses the term "enabling" to describe information technology solutions readily available in the market for possible adoption, such as online selling tools.

The inputs to the CET construct are relevant developments in information technology, broad cultural attitudes toward technology adoption, and other relevant feedback retained from previous cycles of technology adoption. The theorized dimensions (also called second-order factors, process, or routines) that characterize this construct are those that identify, assess, filter, and reach conclusions (RC) regarding the timing and viability of adopting different information technology candidates (Wheeler, 2002).

A strong CET construct produces a timely and well-examined flow of enabling technology choices and delivers these to the corresponding MEO construct. The CET construct also involves efficient communication with its proceeding MEO construct. The responsibility of managing the CET construct falls to either the information technology department or the line-of-business unit (Wheeler, 2002).

3.5.2 Matching Proposed Technologies with Economic Opportunities (MEO)

This construct represents a firm's *ability* to match proposed technology benefits with the possible economic opportunities that can be created for the firm by selecting the proposed technology (Wheeler, 2002). Different information technologies can create benefits and strategic advantages for the firm and maybe even for the whole sector. However, these benefits should be matched with the economic opportunities for the firm. Not all technology benefits are suitable for all firms, and some new technologies require substantial changes in a firm's resources, which then require careful study prior to any decision to invest time and resources in those particular changes.

The inputs to this construct are the technologies delivered from the CET construct. Current business strategy assessment and environmental scanning are conducted to identify shifting customer or business trends, which also contribute to this construct. Wheeler (2002) and Wheeler (2005) suggest that the MEO construct has two dimensions. First is selecting appropriate economic opportunities (SEO) dimension to create both strategic options and business value from the new technology adoption. Second, a dimension for both continual dialogue and sense-making (CDS) ensures a firm's readiness and successful reconfiguration of resources utilizes the use of the new technology with its new economic opportunities from the adoption. Strong MEO produces strategic options and planned business changes that support implementation of the new technology. Further, this construct involves efficient communication with both the preceding CET construct and the following EITBIG construct.

According to Wheeler (2002), three factors characterize the MEO construct. The first is to select the technology that best fits the firm's needs and strategic options. Not all technologies and their economic opportunities are of interest to all firms. Second, the MEO construct is heavily dependent on a firm's willingness to take risks because proposed new technologies have a high level of

uncertainty; however, this uncertainty usually diminishes after implementation and diffusion. Finally, for certain technologies, a firm's ability to sense and respond to changes or new trends in the market is important. However, not all firms can promptly and effectively sense and respond to such trends.

$H_{2:}$ The CET construct is positively associated with the MEO construct.

3.5.3 Executing Information Technology As Business Innovation for Growth (EITBIG)

The execution of a new technology as business innovation for growth represents a firm's *ability* to reconfigure its products, services, sales channels, supply chain, and other resources to successfully implement the proposed technology. The EITBIG construct inputs are a specific technology as a technology selected for further implementation and a commitment to ensuring there will be organizationally relevant changes and innovations. Dimensions for project management (PM), employee education (EE), and the creation of a supportive culture (CSC) within the firm are all necessary aspects of this construct. A strong EITBIG construct produces reconfigurations in a firm's resources that relate to the proposed technology and assure successful implementation. The EITBIG construct also requires efficient communication with its preceding MEO construct (Wheeler, 2002; Wheeler, 2005).

$H_{3:}$ The MEO construct is positively associated with the EITBIG construct.

3.5.4 Business Model Innovation for Online Selling (BMIOS)

In the context of this research, the construct of concern is the innovation (i.e., reconfiguration) of the firm's business model resulted from the implementation of online selling tools. Unlike previous net-enablement constructs that describe the *ability* of a firm to identify, select, and execute a technology in general, this construct describes the *actual* reconfiguration that must take place in the firm's business model to utilize the benefits of the adopted online selling tools. Many researchers argue that when a new technology is adopted, business model innovations do take place (e.g., Schon, 1967; Teece et al., 1997; Suchman & Bishop, 2000; King et al., 2002; Ciborra, 2009). Consequently, the current research developed the BMIOS construct to describe the reconfigurations that online sellers undertake in their business models after implementing online selling tools. That is, the research relates the *ability* of net-enabled firms to implement a technology, as a prerequisite, with innovation in the business model in online selling context. As such, it is important to define further what is meant by 'innovation' and 'business model' and how both are integrated within this construct.

Innovation can be defined as the implementation of an idea perceived as new, whether radical or incremental (Schilling, 2008) in its environment (i.e., firm, sector), even if the idea exists somewhere else (Van De Ven, 1986; Schilling, 2008; Tether, 2002; Utterback, 1982). This definition is also applicable to technical innovations, such as new technologies, products, and services (Schon, 1967; Schilling, 2008), as well as administrative innovations, such as new procedures, polices, and organizational structures (Schon, 1967; Van De Ven, 1986). Innovation requires risk-taking, forward and creative thinking, the ability to combine resources and expertise, and a culture and management that are supportive of change (Schon, 1967; Bailetti & Guild, 1991; Suchman & Bishop, 2000; Schilling, 2008; Todorovic et al., 2005). The importance of innovation is based on the assumption that innovations can create a winning streak for firms when implemented, so firms should quickly

make the most of successful innovations before competitors begin to imitate them (Anthony et al., 2006).

A firm's business model is "the manner in which a business organizes itself to its objectives, which normally involve the generation of profit" (Trites et al., 2006, p. 343). That is, a business model is a description of all of a firm's interrelated activities that convert resources into business value, including that firm's value proposition, market segment, revenue generators, cost structure, profit potential, and value network (Wheeler, 2005; Wu & Hisa, 2008; Afuah & Tucci, 2003; Hedman & Kalling, 2003; Hamermesh et al., 2002) and the firm's ability to facilitate the innovation process (Tarafdar & Gordon, 2007). Simply put, a business model is an overview of a firm's actual business process and activities (Camponovo & Pigneur, 2003).

To integrate the concepts of "innovation" and "business model", researchers argued that a technology implementation requires an innovative response (Teece et al., 1997). This response can be viewed as an innovation in terms of how a firm conducts its operations and activities (Schon, 1967; Schilling, 2008). Generally, all firms in the same sector tend to use similar business models, and these models tend to yield similar results; however, firms also tend to change their business models when adopting information technology innovations. Further, a firm's business model plays a major role in meeting the new business requirements of the newly invested technology by delivering value to the customer through commercialization of the firm's products or services via the new technology (Chesbrough & Rosenbloom, 2002; Hamermesh et al., 2002; Laugesen & Yuan, 2010). Consequently, when a firm implements a new technology, that firm's business model will have undergone innovation, and the new business model then mediates between the newly implemented technology and the value created by changing the business configuration (Chesbrough & Rosenbloom, 2002).

The current research model refers to the adoption of online selling as new technology implemented by firms. The BMIOS targeted in this research is the changes a firm makes in its way of doing business to accommodate and utilize the online selling adoption that was resulted from a well developed net-enablement capability (i.e., represented by the preceding EITBIG construct). These targeted innovations can occur in many aspects of the firm, such as the firm's products, services, sales channels, and supply chain, and they can take many innovative forms, including technological, procedural, and managerial. Business model innovation is characterized in the literature by its detailed routines found in Appendix 1. Figure 3.2 shows the research conceptual model and demonstrates how the model fits into the net-enablement capability.

H_4: The EITBIG construct is positively associated with the BMIOS construct.

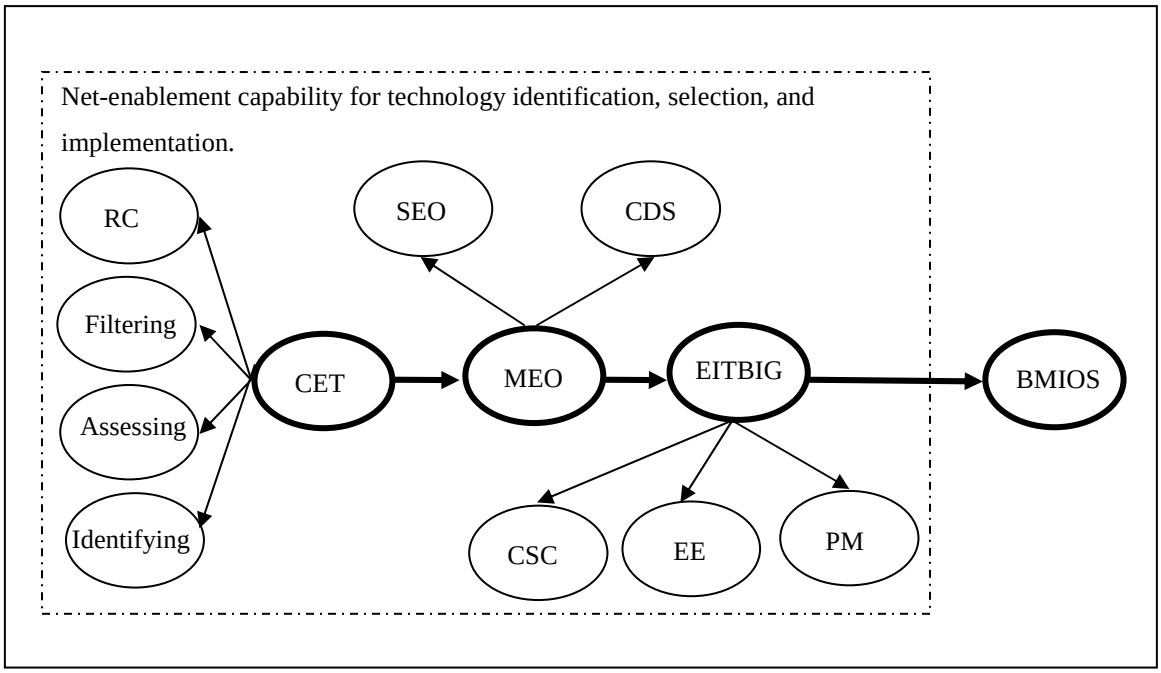


Figure 3.2: The research conceptual model for business model innovations of online selling - NEBIC extended model.

3.6 Summary

In this chapter, the antecedent theories of the current research model were addressed. Two supportive theories inform this research, namely, dynamic capability and absorptive capacity. The dynamic capability theory emphasizes the importance of reducing business uncertainty with the ongoing process of identifying and screening business opportunities and threats; absorptive capacity deals with prior knowledge and its impact on future decisions. The current model accommodates the following dimensions/routines to address both theories:

1- Information communication with internal and external parties helps a firm remain informed about its business environment

2- IT identification and possible adoption encourages continued business growth

3- Employee training is a factor for positive organizational learning and development

4- Supportive culture for change is a medium that appreciates innovation and copes with necessary business changes.

The chapter discusses the NEBIC theory as the primary theory for the research model. The NEBIC theory is an applied theory to develop, test, measure, and understand how firms transform their net-enablement capability into customer value (Wheeler, 2002). The theory relates the creation of customer value to superior development of firm digital networking resources to identify and implement technologies that can advance business growth. The theory helps firms to be informed by business changes and then develop and implement the required actions.

Additionally, the chapter discusses the extension that the current research contributes to the NEBIC model of net-enablement. That extension introduces the concept of business model innovation for online selling (BMIOS). This is to explain the relationship between net-enablement capability, as a

prerequisite, and innovation necessary for business models while accommodating online selling. Further, the chapter justifies why the current model excludes the capability of assessing customer/client value (CV) originally theorized as part of NEBIC.

The chapter concludes by discussing the current research model that measures, predicts, and tests the relationship between a firm's net-enablement capability of technology identification, selection and implementation and innovation in the firm's business model to utilize the implemented online selling tools fully. This research model has four constructs:1) choosing enabling technologies (CET); 2) matching proposed technologies with economic opportunities (MEO)' 3) executing information technology as business innovation for growth (EITBIG); and 4) business model innovation for online selling (BMIOS) , the model outcome construct. To show the prediction power of the research model, the net-enablement constructs (CET, MEO, and EITBIG) accommodate both online sellers and non-online sellers to test whether online sellers are associated with better developed net-enablement constructs compared to non-online sellers. The proposed model argues that online sellers are more likely to have better developed net-enablement constructs than will non-online sellers.

Chapter 4
Methods

This study aims to clarify and to understand the internal organizational capability (i.e. net-enablement capability) that firms utilize to identify, select, and implement technological innovation to achieve further growth. It also analyzes the association between this capability and business model innovation for online sellers. Online selling is examined as a technological innovation that is presumably new to many firms and is not widely used across sectors. As such, the basic hypothesis is that online sellers are more likely to have better developed net-enablement capability than non-online sellers.

This research develops a scale to measure business model innovation for online selling (BMIOS) and test the relationship between net-enablement capability (i.e., CET, MEO, and EITBIG) and BMIOS in the specific context of online selling. Then the research develops multiple scales, based on NEBIC theory, to confirm the validity and relationships within the net-enablement constructs for choosing enabling technologies (CET), matching proposed technologies with economic opportunities (MEO), and executing information technology as effective business innovation for growth (EITBIG) with respect to the ability of a firm to adopt a specific technology.

From a methodological perspective, to form a quantitative and testable hypothesis for the research model, Wheeler (2002, p. 141) suggests the following steps for research related to NEBIC:

- Identify scales from the literature.
- If no scale is available for a specific construct, identify related detailed routines from the literature and develop that scale.

- Test the scale to evaluate Cronbach's alpha and eliminate items to increase scale efficiency.
- Ensure that different types of validities (face, convergent, and discriminate) are applied.

Wheeler's suggested approach is utilized in conducting this two-stage research (the multiple-method framework). The first stage was exploratory in nature and identified routines from the literature and developed scales to validate the research model constructs. To check for the face validity of the developed scales, the study sought assistance from qualified e-business adopters and researchers to help further purify and quantify the items in the scales. This stage is concluded by a discussion of the results from this exploratory stage.

The second stage was survey-based, and focused on quantitatively testing the validity of the developed scales derived from the exploratory stage and the hypothesized relationships. This chapter describes the general issues and the findings of this empirical stage, and includes the possible biases related to the use of key informants, different levels of online selling adoption, sampling and the source directory. It discusses how these possible issues were addressed and controlled. Survey design, response rate of the respondents, non-response issues, data imputation, and the final items of the scales are also covered. The chapter concludes with demographic results from the survey (i.e. characteristics of the respondents) and general information about the online sellers. These analyses are presented in Chapter 5 and their implications are discussed in detail in Chapter 6.

4.1 Online Selling Definition

Online selling is defined by Statistics Canada in its Survey of Electronic Commerce and Technology (SECT) as the act of selling products using the Internet, whether payment is made online or offline, pricing is fixed or dynamic (traditional commerce vs. auction), and sales are conducted using a firm's own website or through a third-party website. This definition also addresses online selling activities conducted between firms (B2B) and between firms and customers (B2C) (SECT, 2007).

To maintain consistency with the literature, Statistics Canada and SECT, this research uses the SECT definition of online selling: the placing of orders and the establishing of purchase commitments using the Internet (e.g., by email, a website, EDI, extranet, etc.), whether actual payment is made online or offline (e.g., via the Internet, telephone, facsimile, cash, cheque, etc.), or whether the sales are conducted by a firm's own website or a third-party website. The sale must be transacted directly by the firm and not on the firm's behalf. This definition relates to both fixed and dynamic pricing.

4.2 Research – Multiple Methods

The literature has no full set of scales for the current research model; however, published scales were still used in developing the scales for some aspects of this research model. The literature was used for descriptive definitions and detailed routines that served as the basis for developing questions for other parts of the model. The multiple-method framework was deemed the most appropriate approach to the research questions as suggested by Wheeler (2002), the NEBIC theory developer, and many other researchers for similar studies (e.g., Strauss & Corbin, 1990; DeVellis, 2003; Williams, 2004). The research starts with the exploratory stage, and then utilizes empirical methods in the second stage.

4.3 Unit of Analysis

The research gathered data on net-enablement capabilities and business model innovation for online selling (if applicable) from a sample of firms from all Canadian private sectors. Key informants were used to gather data about their firms. The collected data represents the perceptions of and the knowledge of those key informants on the behavior and characteristics of their respective firms.

4.4 The Exploratory Research Stage

Both Wheeler (2002) and Williams (2004) suggest using an exploratory strategy when conducting research on the NEBIC theory. The exploratory strategy is a best fit for two reasons. First, the NEBIC model is still in its early stages of investigation, and all of its constructs have no scales (Williams, 2004). Thus, scales for the current study were developed based on the literature to measure and test the constructs of the model. Second, Strauss and Corbin (1990) recommend using an exploratory strategy within research areas that have limited existing research to help establish solid constructs and causal relationships needed for further empirical testing. This research thus assumes that the research areas on NEBIC, online selling, and the associated innovation in business models are under-researched in the literature.

4.4.1 Scale Development: Existing Scale Identification and Routine Elicitation

Many scholars assert that to develop better scales, the researcher should use the literature to collect items to capture the specific nature of the study constructs. The quality of the collected items can then be enhanced by gathering judgments and insights from experts (e.g., Churchill, 1979; Wheeler, 2002; DeVellis, 2003; Worthington & Whittaker, 2006).

Construct	Dimension/Routine	Scale Available	Detailed-Routines Available	Author(s)
Choosing Enabling Technology (CET)	Identifying		✔	1- Wheeler (2005). 2- Williams (2004, pp. 325-27).
	Assessing		✔	
	Filtering		✔	
	Reaching Conclusion (RC)		✔	
Matching Economic Opportunities (MEO)	Selecting Economic Opportunities (SEO)		✔	1- Christensen, *et al*. in Hills (1994, pp. 67-72). 2- Corbett (2002). 3- Singh (1998, pp. 25-27). 4- Wheeler (2005).
	Continual Dialogue and Sensemaking (CDS)	✔		1- Menon, *et al.* (1999, p. 37). 2- Akgun, *et al.* (2006, pp. 215-16, 222).
Executing IT as Business Innovation for Growth (EITBIG)	Project Management (PM)	✔		1- Cook (2004, pp. 120-28).
	Employee Education (EE)	✔		1- Cook (2004, p. 127).
	Creation of a Supportive Culture (CSC)	✔		1- Menon, *et al.* (1999, p. 36). 2- Cameron and Quinn (1999, pp. 154-66).
Business Model Innovation for Online Selling (BMIOS)	----------		✔	1- Chesbrough and Rosenbloom (2002, pp. 533-34). 2- Chesbrough (2003, p. 89). 3- Chesbrough (2007, pp. 16-17).

Table 4.1: Summary of the literature, the available scales, and the detailed routines for each dimension/routine of the research constructs.

Consequently, this research uses two methods of scale development. First, it adapts scales that researchers used previously, modifying them to fit the current context. Second, for the construct dimensions in which an existing scale could not be identified, the literature was used to identify

relevant detailed routines that could be used for further empirical development. That is, when no scale existed for a dimension of a construct, the detailed routines extracted from the literature helped establish a basic understanding of those specific dimensions. These collected detailed routines were validated by expert judgment and converted into questions/scale items. More discussion about candidate selection, interview design, and the exploratory stage results are in the following sections. See Appendix 1 for details about collected routines and scales. Table 4.1 summarizes the collected scales and their dimensions.

4.4.2 Establishing Face Validity, Candidate Selection, and Interview Design

Reviewing the scale items and ensuring their face validity before distributing the survey to the targeted sample is highly recommended (Churchill, 1979; Wheeler, 2002; DeVellis, 2003). Thus, a series of one-on-one email communications took place with 157 experts. This exploratory stage began with the conversion of all collected detailed routines into 7-point Likert scale questions. An email invitation to participate was sent to each expert. If there was no response, a follow-up telephone call or email was initiated to increase the response rate. These email communications were based on the survey found in Appendix 2.

These experts were not randomly selected; specific criteria were employed. The selection of experts to help refine scale items is recommended by many methodologists, including Churchill (1979), DeVellis (2003), and Hardesty and Bearden (2004). Experts can help to assess the face validity of scale items and to provide guidance on improving the measurement of constructs by recommending what items to modify, add, or remove. Three types of experts were recruited – e-business researchers, managers in firms that sell online, and eBay agents.

Two main strategies were used to find potential researchers. First, the research targeted faculties that teach e-business at the graduate level. Dalhousie and Ottawa Universities are the only providers of such specialized programs in Canada. Second, all international researchers cited in the literature review were targeted. These researchers were asked to provide referrals of other researchers in the same field to include them in the exploratory stage.

In this exploratory stage, both managers in firms that sell online and eBay agents were selected, solely from those sectors with below-average adoption rates of online selling. As the research model emphasizes the internal capabilities of a firm, the existence of any innovative and internal driving factors to adopt online selling are assumed to be most likely observed in sectors with below-average adoption of online selling. This is because the decision to sell online in those sectors is presumably based on internal organizational factors without significant external encouragement. Simply put, when there is less external pressure to adopt, internal capabilities may play a larger role in sectors with lower adoption rates. On the other hand, above-average adoption sectors of online selling are often driven to do so by their business environment (i.e., external factors). While this argument was not tested previously in the online selling context, it is aligned with other research findings in the general context of information technology adoption (e.g., Martin, 1994; Rask & Kargh, 2004; Kioses et al., 2006). Thus, while the exploratory stage of this research was informed by below-average adoption rates of online selling sectors, the empirical stage targeted all sectors with different online selling adoption rates.

Statistics Canada's annual survey of e-business use (2007) and the Canadian Company Capabilities directory (CCC) were used to extract both managers of firms that sell online and eBay agent

candidates. Details about the CCC directory are given later in this chapter. The two data sources were used to determine the sectors with below-average rates of online selling adoption and to identify all associated firms. The online presence of each firm listed in the CCC directory in the targeted sectors and the chosen province was then checked. Those firms located in Ontario that have products and services displayed online and offered online payment were selected.

EBay agent candidates were selected based on three criteria: First, they listed Ontario as their location; this was to better represent the Canadian context and to facilitate further communication with candidates if need be. Second, they had at least a 99% positive feedback record and were ranked by eBay as a "Power Seller." "Power Seller" is a quality ranking assigned to distinguish eBay agents who have an excellent record maintaining significant sales volume, providing high levels of customer service, and maintaining positive customer feedback (eBay, 2009). This ranking of "Power Seller" was a requisite in this research to ensure agent reliability in customer service excellence, and to avoid choosing fraudulent or poorly-performing agents. Third, the products the eBay candidates sold were similar to those sold by firms in sectors with below-average adoption rates of online selling.

4.4.3 Exploratory Research Results

In total, 157 experts were targeted. Of those, 102 were researchers selected from academic fields related to e-business. Ultimately, 31 valid responses from this group were collected. Also, 36 practitioners from firms engaged in online selling activities from different sectors with below-average rates of online selling in Ontario were recruited, and 15 valid responses were received from them. The remaining 19 experts were eBay agents from Ontario who sell products similar to those sold by the

sectors with below-average rates of online selling. This set returned 3 valid responses. See Table 4.2 for further details about the targeted candidates.

Candidates Category	Targeted Sample	# of Valid Responses	Demographic
Researchers	102	31	Aarhus University, DK Athens University of Economics and Business, GR Dalhousie University, NS Deakin University, AU Louisiana State University, LA Ottawa University, ON Queensland University of Technology, AU Texas A&M University-Corpus Christi, TX University of Manchester, UK University of Otago, NZ University of Ulster, UK University of Waterloo, ON
Firms	36	15	Online sellers from different sectors with below-average adoption of online selling in Ontario.
eBay	19	3	Ontario displayed as seller location. Selling products like those sold by sectors with below-average adoption of online selling. Should have a positive feedback rating of 99% or more and should be ranked as a "Power Seller" by eBay administrators for best and most reliable agents.
Total	157	49	

Table 4.2: Targeted candidates for the research exploratory stage.

According to Churchill (1979) and Hardesty and Bearden (2004), not all items collected from the literature need to be in the final scale. Thus, experts were asked to indicate the extent to which they felt each proposed item was associated with the overall construct. Also, experts had the option to change or delete items they did not find relevant and add any information they believed to be relevant to the scale.

After collecting responses from all 49 experts, the responses for each survey item were checked, and all items were accepted. In addition, the wording of many items was modified as the experts suggested. Some experts suggested merging items as they described the same thing. Adding new items was also suggested to reflect the associated construct more effectively. All suggested modifications or additions were implemented on the survey items to reflect the experts' opinions. Then, all previously collected scales from the literature (see Appendix 1) were added. The final version of the survey represents the collected items from experts and the gathered scales from the literature. See Appendix 3 for the final version of the survey.

The final version of the survey was developed and published online and made available for experts to review and test. Academics were asked to comment on the design, appearance, logical flow, and wording of the items, and practitioners were asked to answer the survey questions. This review was intended as a pre-test of the survey to ensure it was working smoothly and free from errors. Collectively, 29 responses were returned with no major concerns expressed about the design of the survey or the wording of its items.

4.5 Empirical Research Stage: Survey Design

This section describes the design of the empirical stage, the issue of using key informants as a source to collect data about their firms, the process of selecting sectors and firms in this study, and research survey administration and design. It includes the response rate of the survey and a discussion of how to handle issues related to non-response bias. Finally, insights about the data collected are presented to provide a preface to the detailed analysis reported in Chapter 5.

Unlike the exploratory stage, the aim of this empirical stage was to collect data from all Canadian private sectors. This process assessed the statistical validity and reliability of the developed scale items. The data gathered tested the psychometric properties of net-enablement constructs of the research model. Further, the collected data validated the relationship between net-enablement constructs and business model innovation for online selling. The analysis and findings produced an empirically derived and theoretically based confirmation of NEBIC validity and the associated business model innovation for online selling.

4.5.1 Survey Background

The survey produced in the first stage of this research (see Appendix 3) was converted into an online version using SurveyGizmo.com, a web-based online survey service provider. Appendix 4 includes screens of the actual published survey. This specialized software tool accommodates branching technique, and has the ability to send customized recruitment emails tailored specifically to each candidate, including name, job title, and firm name. The data collected, however, were anonymous to reduce method bias and ensure that participant data was not identified and consequently used in any harmful way, as Podsakoff et al. (2003) warned. The survey used specific structured questions intended to capture data about the research model's latent constructs of BMIOS and its association with net-enablement capability.

Compared to a pen-and-paper survey, an online survey is generally more convenient and effective (Dillman & Bowker, 2001). It can yield a higher response rate, has a shorter response delay, provides an instant data-entry validity check, and minimizes data-entry time because the data is already in an

electronic format (Cobanoglu, et al., 2001). Researchers have found, however, that online surveys do have a higher non-delivery rate (Rogelberg & Stanton, 2007; Baruch & Holtom, 2008).

According to DeVellis (2003), the Likert scale is a technique used for measuring beliefs, opinions, and attitudes. As this research measures informants' opinions about business internal capability development, the main items of the survey (i.e., items measuring the research model's four constructs) were framed as a 7-point Likert scale with anchors varying from 1 (poorly developed) to 7 (highly developed), and with 4 being uncertain, to measure each respondent's opinion about a business capability. However, for all other demographic items, the anchors varied from 1 (strongly disagree) to 7 (strongly agree) and 4 (uncertain); they were consistent with Dillman's (2000) and DeVellis's (2003) recommendations to use equal numbers when presenting extreme responses that are direct opposites (i.e., strongly disagree vs. strongly agree), and to have a neutral break in the middle that represents respondent uncertainty. Establishing such variations for each item is a requisite that allow each item to co-vary with other items and to correlate with the total (Dillman, 2000; DeVellis, 2003).

To ensure the internal validity and consistency of the survey, specific validation items were added. Campbell and Fiske (1959) and DeVellis (2003) suggest two validation techniques – 1) inclusion of items to detect or control for errors and 2) testing the theorized relationships between constructs. By applying the first technique's perspective, this survey was designed to control the data entry and to constrain data errors by using radio buttons and check boxes. While radio buttons are used to limit the user to a single response, check boxes are used to allow the user to select more than one item. In this survey, the user was allowed to leave any item blank. The user, however, was not allowed to leave

logical (branching) questions unanswered because that would allow him/her to proceed to subsequent questions relating to the missing choice.

Further, items were added into different demographic sections of the survey to check and control for respondent errors. For example, in the general demographic section, a question was added related to the year when the firm was established. Later, in the demographic section for online sellers, a question was added about the year when the firm started selling online. A validation function was included to check that the firm was established before selling online. Otherwise, the respondent was prompted to correct his/her answer. Likewise, respondents were asked to report their percentage of sales based on countries where they sold their products. A validation function was added to ensure that the total did not exceed 100%.

A question about how firms received their online orders and a question about whether they used online payment and/or offline payment were included. Later, a direct question asks whether firms received their payment through online and/or offline payment options. If contradictory answers were collected, that case was dropped from the analysis. There were some cases with contradictory results. The majority of these cases were associated with very high level of missing data (i.e., more than 90%) as well as there is no useful information or helpful patterns can be further extracted. Further, there was no case of data contradiction reported in the retained cases. The second validation technique, testing the theorized relationships between constructs is described in detail in the next chapter.

4.5.2 Key Informant and Common Method Variance Issue

The survey collected data about firms. A key informant from each firm with sufficient knowledge about the firm and its operations was used to gather information and opinions about the firm's operations. These key informants were mainly presidents, CEOs, and owners. In some cases, these key informants forwarded the request to an IT specialist or some other insider with more knowledge of the firm's IT implementation in general and, more specifically, the firm's adoption of online selling, if applicable. Thus, the collected data represents an individual's attitudes and perceptions about each firm's behavior.

Researchers have warned that using a single informant to collect data may result in data entry errors and biases, including social desirability (Kohli et al., 1993). Common method variance (CMV) can be another problem stemming from use of a key informant (Campbell & Fiske, 1959). According to Spector (2006), while biases are an indisputable fact in research studies, CMV is more arbitrary and vague in nature.

CMV can result from "having a common rater, a common measurement context, a common item context, or from the characteristics of the items themselves" (Podsakoff et al., 2003, p. 885). This effect generates a variance in responses because of the method used rather than the research model (Spector, 2006). Other researchers, however, have supported the use of a single informant and accept its issues because it is the most feasible and easiest way to conduct market-related studies. The existence of problems in most cases does not significantly change the research results and should not threaten overall research validity (Campbell, 1955; Seidler, 1974; Stump & Heide, 1996; Doty & Glick, 1998). Further, some researchers have offered suggestions to minimize problems associated

with the single informant approach (e.g., Podsakoff et al., 2003; Chang et al., 2010). These suggestions are discussed below.

This research utilized a single informant, common measurement, and a common item context, so it was expected to exhibit CMV. Podsakoff et al. (2003) and Spector (2006) suggested many procedural and statistical tools to reduce the effect of CMV, but they also asserted that it is costly, time consuming, and in some cases not possible to completely overcome the problems associated with using a single informant. This research applied all applicable procedures and statistical tools to control for CMV and minimize the drawbacks associated with collecting data from a single informant. The CMV issues discussed here cover the procedures used to control for CMV, including use of common source/respondent, measurement context, item context, and item characteristics. Statistical tools to test for CMV are discussed separately in Chapter 5.

From the respondent perspective, because this research is based on single informants, the participants could be a source of bias, i.e., social desirability. According to Podsakoff et al. (2003), the researcher should "separate measurement of predictor and criterion variables psychologically and guarantee response anonymity" (p. 898) to minimize that potential bias. Thus, in this research, respondents were anonymous, and the survey was divided into branches to prevent respondent fatigue. Further, respondents were unaware of study details as well as the study's ultimate goal.

Finally, survey items were measured in different ways. For example, respondents were asked to rate some items, select some items, and sometimes write specific answers. In addition, the branching technique further clarified some items or let the user to jump to another section of the survey. Collectively, these techniques validate the collected data, assure internal validity and consistency of

the survey, and create psychological separations between the variables of the survey so the respondents would not be able to draw any direct relationship between the study variables.

Another source of potential CMV is common measurement, also the case in this research. Richman et al. (1999) and Podsakoff et al. (2003) suggested using a medium and a location that minimizes social desirability bias. Spector (2006) further suggested choosing an optimal time to target respondents to avoid issues related to mood or psychological problems. Consequently, to minimize CMV associated with medium, location, and timing, the survey invitation was sent by email, and the actual survey was available online with a particular response time frame. The survey could be answered from any location and at any time convenient for the informant.

Common item context is also a source for CMV. According to Hinkin (1995), grouping related items in a survey can be a source of bias. Also, a lengthy survey can lead to respondent fatigue, degrading the quality of the responses. Item grouping and length can let the respondent be influenced by previous items when responding to a later item. Thus, the survey was divided into several pages/screens and used the branching technique. These techniques help reduce respondent fatigue by accommodating items to fit on one screen at one time without requiring the respondent to scroll through large amounts of information. It also facilitated the use of different screen structure (e.g., hide/show items based on the respondent's answer). Distributing many items, even related, in a lengthy survey on many pages/screens can minimize the risk of a response being influenced by the same respondent's answer to an earlier question.

The last source of CMV suggested by Podsakoff et al. (2003) is the characteristic for how items are worded or the context of the items. For example, social desirability bias or the incorrect interpretation

of an item can influence respondents' answers. Thus, to minimize this risk, the survey's wording was reviewed by 49 experts from academia, different firms, and owners of eBay online stores during the exploratory stage of the research. As noted, survey items were changed based on these experts' feedbacks. In addition, jargon was used minimally or a clear definition of an unusual term was provided.

Scholars have suggested many efficient ways to prevent and measure the impact of CMV; however, not all these suggestions were applied to this research due to timing and financial and practical barriers. In many cases, these suggestions to prevent and measure the impact of CMV are characterized to be insufficient in specifying the exact effect of CMV and controlling all sources of possible bias. Many researchers and scholars acknowledge these shortcomings (e.g., Podsakoff et al., 2003; Spector, 2006). Even more objective procedures (e.g., statistical tools) for controlling and measuring the effects of CMV can lack clear assumptions, provide weak evidence and be impractical (Spector, 2006). Still, the viability of using statistical tools to control and measure for CMV is revisited in the next chapter, after assessing the full research model with structural equation modeling (SEM).

4.5.3 Selecting Sectors and Firms

The population sampled for this research came from all Canadian industry sectors with an emphasis on online sellers. The research targeted all types of online selling adoption practiced by firms (i.e., successful adopters, non-successful adopters, and non-adopters) to assess the associated level of development in net-enablement capability. In addition, cross-sectional data from sectors with above- and below-average rates of online selling adoption were collected to determine if firms from sectors

with above-average rates of online selling adoption behave differently from sectors with below-average rates of online selling adoption. Analyzing data from these different groups helped assess generalizability of the research model. Thus, all Canadian sectors were included because of the following four reasons.

First, a large gap exists in the percentages for above- and below-average rates of online selling adoption sectors. Some sectors reached more than double the online selling volume of other sectors. For example, in 2006, the agricultural sector had only 5% of firms involved in online selling, a relatively low percentage compared to the average for all sectors, which is about 9%. Further, this statistics is very low when compared to firms in the information and cultural industries and the arts, entertainment, and recreation sectors. In these sectors, about 20% of firms engage in online selling (Statistics Canada, 2007). However, all sectors do share the common theme of having a minority of firms selling online.

The second reason for selecting all sectors and all types of adopters was to collect the greatest amount of data. Sufficient data must be collected to compare below- and above-average rates of online selling adoption and validate the research model. Third, by selecting all Canadian sectors and different online selling practices, the research can yield beneficial results for the research model and also for non-online selling adopters (benefits for both research and practice). The research can be enhanced by including online selling adopters and non-adopters from different sectors and thus address the research model's constructs and hypotheses. Variables in net-enablement are most likely to be noted where extreme contrasts in e-business use are found. From a practical standpoint, findings from online selling adopters will help non-adopters find opportunities within the online environment to reach local and international customers.

Fourth, the literature shows that sectors with below-average rates of online selling adoption experience pioneer initiatives from firms to convert part of their traditional business to e-business. For example, in the agriculture, forestry, fishing, and hunting sectors, some e-business activities (including online selling) are present and require further investigation (Vlosky, 1999; Pitis & Vlosky, 2000; Stennes, et al., 2006). Including these sectors and comparing them with other higher adoption sectors meets one of the objectives of the current study to respond to the literature that requests the exploration of sectors with below-average rates of online selling adoption and the reasons behind their initiatives to sell products or services using the Internet.

Developing a target sample for the national survey presented several challenges. Although Statistics Canada has access to contact details for all enterprises and Canadian law compels a response, it is difficult for academic researchers to identify potential respondents and to achieve a high response rate. Potential respondents are typically identified in industrial directories. Most directories, however, are biased toward larger, older, and publicly-listed firms. In addition, these directories rarely provide contact information for specific individuals. The Canadian Company Capabilities (CCC) directory is a unique resource for Canadian firms. It covers firms of all sizes and types (about fifty thousand of them); it may, however, over-represent Ontario firms, smaller firms, and those firms with better technological experience.

To investigate this concern, the CCC directory was reviewed and 49,766 firms across Canada and representing 23 different sectors were identified (Industry Canada, 2009). For details, see Appendix 5. Table 4.3 represent adoption rates for various information and communication technologies across five sectors out of the identified twenty-three. Then, all Ontario firms were extracted, and information

on each company's type of web presence (i.e., web presence, no web presence, and online selling presence) was reviewed. It was evident that firms in Ontario maybe were over-represented and that the ratios for the use of different type types of technology might be higher than the data reported in Statistics Canada, as shown in Tables 4.4 and 4.5. For example, in the Ontario agriculture sector, 35 out of 95 firms had not yet established an online presence. Of the 60 websites who had, 44 were informative (passive) and 16 had online selling activities.

Sector Name	NAICS	Website Presence Rate (%)	Email use (%)	Internet use (%)	Online Buying Rate (%)	Online Selling Rate (%)
Mining	21	30.77	86.15	89.81	42.31	0.21
Management of Companies	55	38.46	72.74	75.84	40.75	3.93
Agriculture	11	11.03	56.97	63.52	28.31	5.75
Information Industries	51	81.93	99.01	99.01	77.62	27.15
Arts	71	64.25	87.68	90.90	50.20	20.3
Sectors' Avg.	---	41.41	77.50	82.78	44.79	9.00

Table 4.3: Use of information and communications technologies in year 2006 nationwide.
Shaded data: represents data higher than the Canadian sector's average.
(Source: Statistics Canada (2007), CANSIM, tables 358-0007, 358-0008, 358-0010, and 358-0011)

It should be cautioned, however, that the data presented in Tables 4.4 and 4.5 are based on other published data from the CCC after consulting/reviewing all the Ontario firm websites in the selected sectors. The purpose of this process was to examine the possible bias of the CCC directory and to determine how relevant it is to the Statistics Canada reported data in Appendix 5.

Sector Name	Number of Firms Nationwide	Ontario			
		Number of Firms	% Over Other Provinces	Web Presence Rate (%)	Online Selling Rate (%)
Mining	519	58	11	81	10
Management	57	16	28	37.5	6
Agriculture	220	95	43	60	17
Information	3153	1393	44	87	37.5
Arts	503	196	39	62	31.5
				Avg. 65%	Avg. 22%

Table 4.4: Rates of online selling adoption in Ontario.
Note: Shaded data represents data higher than the selected sample's sector average.
(Source: CCC Directory [Industry Canada, 2009] and researcher investigation)

The data in Tables 4.4 and 4.5 differs from that in Table 4.3. Table 4.3 presents data collected and reported by Statistics Canada, which is difficult for academic researchers to access in detail and to use to identify potential respondents. Tables 4.3, 4.4 and 4.5, however, share and reflect the same pattern of below-average and above-average rates of online selling adoption categorization among the selected sectors (see Figure 4.1). Issues related to controlling any possible bias based on using the CCC directory are addressed when discussing the effect of control variables.

The CCC directory has its advantages. It is updated frequently; it provides a contact person (usually the founder, CEO, or VP of marketing) and a personal email address; and it is available without charge. The Canadian government maintains this database. Additionally, the CCC website has powerful and advanced search and reporting capabilities. Search results can be presented in many forms based on the level of detail and the type of user request (Industry Canada, 2009).

Sectors	NAICS	Total Number of Firms	Web Presence		
			No Web Presence	Informative (Passive)	Online selling (%)
Mining, Quarrying, and Oil and Gas Extraction [21]					
Oil and Gas Extraction	211	2	0	2	0
Mining and Quarrying	212	23	8	13	2
Support Activities	213	33	3	26	4
Total		**58**	**11**	**41**	**6 (10%)**
Management of Companies and Enterprises [55]					
Total		**16**	**10**	**5**	**1 (6%)**
Agriculture, Forestry, Fishing, and Hunting [11]					
Crop Production	111	35	15	19	1
Animal Production	112	10	3	4	3
Forestry and Logging	113	9	2	4	3
Fishing and Hunting	114	3	0	1	2
Support Activities	115	38	15	16	7
Total		**95**	**35**	**44**	**16 (17%)**
Information and Cultural Industries [51]					
Publishing	511	310	24	140	146
Motion Picture	512	222	38	120	64
Broadcasting	515	20	2	15	3
Telecommunications	517	334	63	151	120
Data Processing, Hosting, and Related Services	518	223	23	115	85
Other Services	519	284	37	141	106
Total		**1393**	**187**	**682**	**524 (37.5%)**
Arts, Entertainment, and Recreation [71]					
Performing Arts and Spectator Sports	711	150	63	44	43
Heritage Institutions	712	8	1	4	3
Amusement	713	38	11	11	16
Total		**196**	**75**	**59**	**62 (31.5%)**

Table 4.5: Types of web presence from the NAICS for Ontario: Mining [21], management [55], agriculture [11], information [51], and arts [71] sectors.
(Source: CCC Directory [Industry Canada, 2009] and researcher investigation)

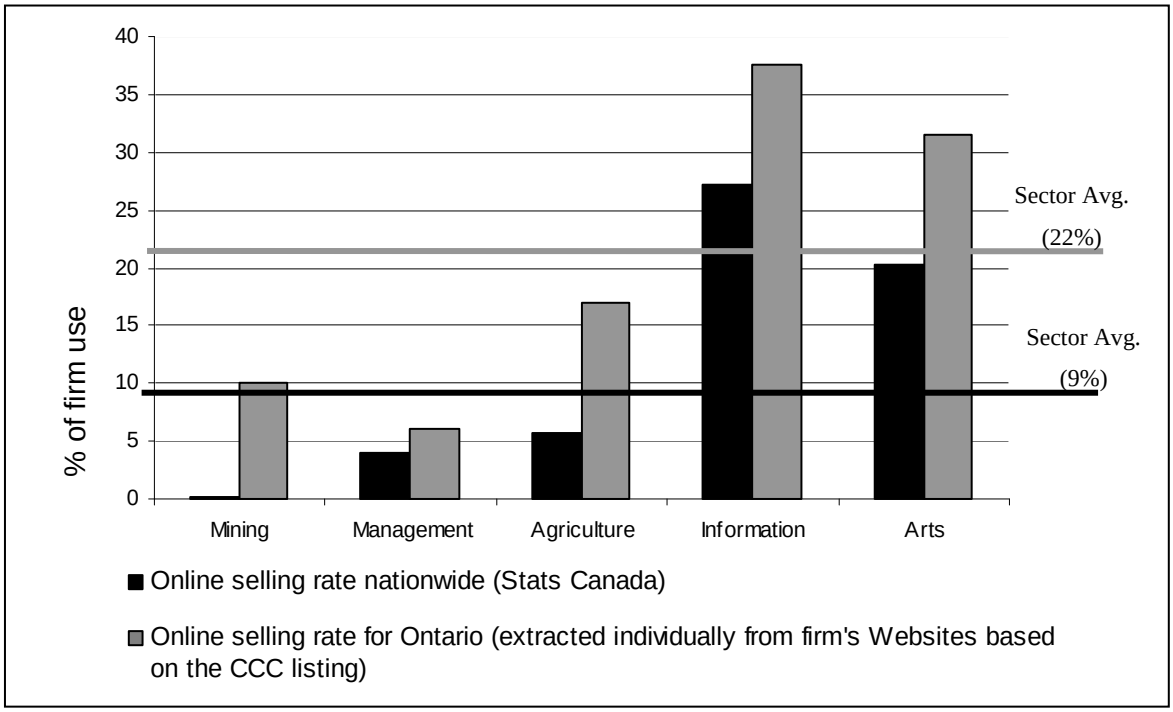


Figure 4.1: Comparison of online selling rate among specific sectors for data published by Statistics Canada for year 2006 (Statistics Canada, 2007) and data extracted and examined individually from firm websites based on the CCC listing.
(Sources: Statistics Canada, CANSIM, Table 358-0010, Industry Canada, 2009 and research findings)

The number of firms in each sector and the contact information for each firm were obtained from the CCC website. The targeted sample included all firms listed on the CCC website (about fifty thousand firms), and then was narrowed down to firms with email contact information — 41,141 of them (Industry Canada, 2009). All firms without email contact information were excluded. For details on this data, see Appendix 5.

4.5.4 Control Variables Analysis

The focus of this research is on capability development. Certain capabilities may vary for firms because of different variables, and this may affect the outcomes for this study. The research controls

for these expected variables to assess their effect on variations in the outcome construct (i.e., BMIOS). Among other variables, level of online selling, past experience with online buying, and firm size were expected to influence the results of this research.

Scholars suggest introducing control variables when the researcher anticipates other explanatory independent variables (i.e., those not included in the theoretical model) to affect the dependent variable (Diekhoff, 1996; Hair et al., 2010). Introducing these independent variables helps in assessing their impact on the dependent variable and reducing the unexplained variance produced by the model.

In this study, there are three independent variables: 1) level of online selling, 2) past experience with online buying, and 3) size of the firm. These may affect the model dependent constructs and impact the research results. These impacts were tested against the dependent variable, BMIOS. Different levels of online selling adoption rates, the status of prior experience in online buying, and different sizes of firms can affect the extent to which firms innovate their business models to accommodate online selling.

Level of Online Selling

Levels of online selling can be classified as above- and below-average rates of adoption. Indeed, data collected by Statistics Canada showed a large gap between different sectors in online selling adoption rates as discussed in Chapters 1 and 2. Further, researchers differentiated sectors with higher IT adoption rates from sectors with lower IT adoption rates due to pressure from the business environment. Firms in sectors with higher IT adoption rates were deemed to be propelled by their business environment. Firms in sectors characterized as being challenging for IT adoption (i.e.,

sectors with lower adoption rates) were expected to be internally motivated to initiate moves toward IT adoption (e.g., Martin, 1994; Kioses et al., 2006). Other researchers characterize higher online selling adoption sectors as having products or services suitable for online selling, and lower online selling adoption sectors as having products or services not as appropriate for online selling (e.g., Bakker, 2000; OECD, 2001). Thus, the key differences between these sectors that accounted for online selling might be their respective external business environments and/or internal initiatives.

From a theoretical perspective, this study assesses the internal capabilities of the firms. The assumption is that the extent to which firms innovate their business models and adopt online selling is affected by the sector's level of online selling adoption rate.

Past Experience of Online Buying

Another expected influencing variable is prior online buying experience of a firm. Some relevant learning experience may be developed through prior experiences with online buying (i.e., absorptive capacity). Notably, the Statistics Canada data for 2006 shows that online buying is much more common than online selling (See Figure 4.2). The relationship between rates of online selling and buying was further assessed and addressed, as it seems uninvestigated in the literature. Table 4.3 presents this relationship at the sector level based on data published by Statistics Canada (2007), and website presence, email use, Internet use, and online buying. The relationships between these different tools of e-business showed no consistent patterns. Specifically, while online buying is, on average, much more common than online selling, there is no consistent pattern in the lower-adoption sectors. From a statistical point of view, the correlation between rate of online selling and buying for all the private sectors was calculated to be 0.65 (i.e., moderate effect of online buying on online selling) and the Variance Explained (VE) explained by the adoption of online buying was 42%.

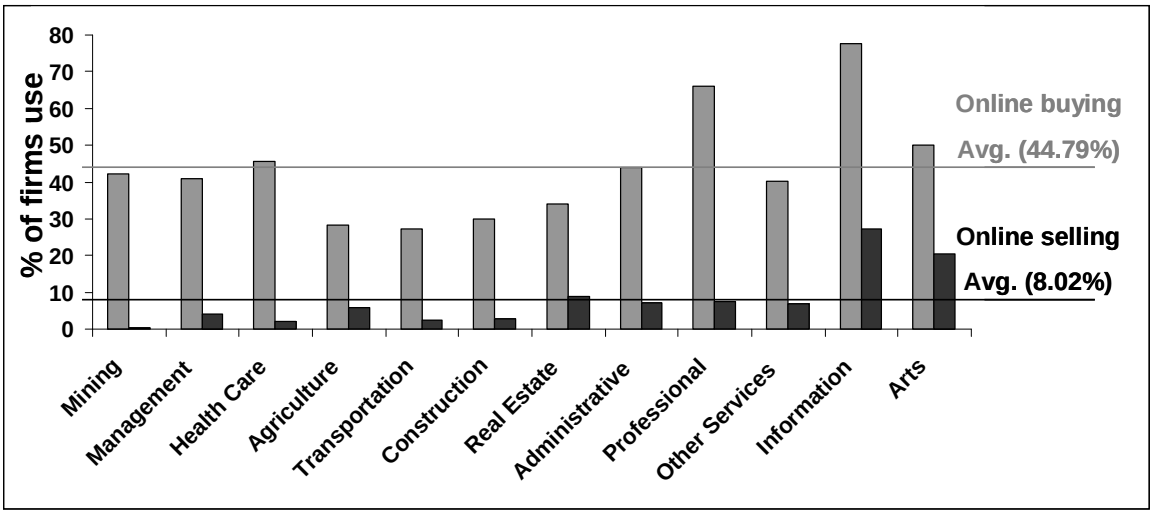


Figure 4.2: The relationship between use of online selling and online buying across some sectors targeted by the study.
Source: CANSIM, Tables 358-0010 and 358-0011 for year 2006 (Statistics Canada, 2007).

From a theoretical perspective, the study assesses the internal capabilities of these firms. The extent to which firms innovate their business models would hypothesize as being affected by past online buying experience of the firms.

Size of the Firm

Because this research used the CCC directory, the concern is that the sample could be biased toward smaller firms and those with better IT use. Many researchers argue that smaller firms are different than larger ones. According to Martin (1994) and Golovko and Valentini (2011), smaller firms are more likely to be innovative. Fischer and Reuber (2011) argue that since the Canadian domestic market is relatively small, smaller firms find it more promising to join the online market to maintain growth. Indeed, the current research dependent construct relate to business innovation regarding

online selling adoption. Thus, this study might over- represent smaller and innovative firms at the expense of larger and more traditional firms.

Further, no studies have investigated the biases of the CCC directory systematically for Canadian firm population. However in their research, other students at the University of Waterloo have noted that the CCC directory provides much better coverage than either Scott's directory or Dunn and Bradstreet (e.g., Sheppard, 2010; Tucker, 2011). The CCC directory is also better at covering smaller firms at the expense of larger firms, and this bias was evidenced in this study too. As the use of the CCC directory creates a source of potential bias toward smaller firms, this research controls for firm size to test size effect on the research outcomes. This study assumes that the extent to which firms innovate their business models to utilize the opportunities of the adoption of online selling is affected by firm size.

4.5.5 Survey Design

The survey had 130 items that focused on net-enablement capability and business model innovation for online selling concepts, divided into three main parts. The demographic part totalled 62 items and 4 subsections: General demographic items (8 items); demographic items for online buyers (4 items); demographic items for online sellers (40 items); and demographic items for non-online sellers (10 items). The net-enablement capability part totalled 55 items and 3 subsections: CET (22 items), MEO (12 items), and EITBIG (21 items). Each item addressed an aspect of a firm's net-enablement and concepts affecting decisions related to the adoption of technology in a general context.

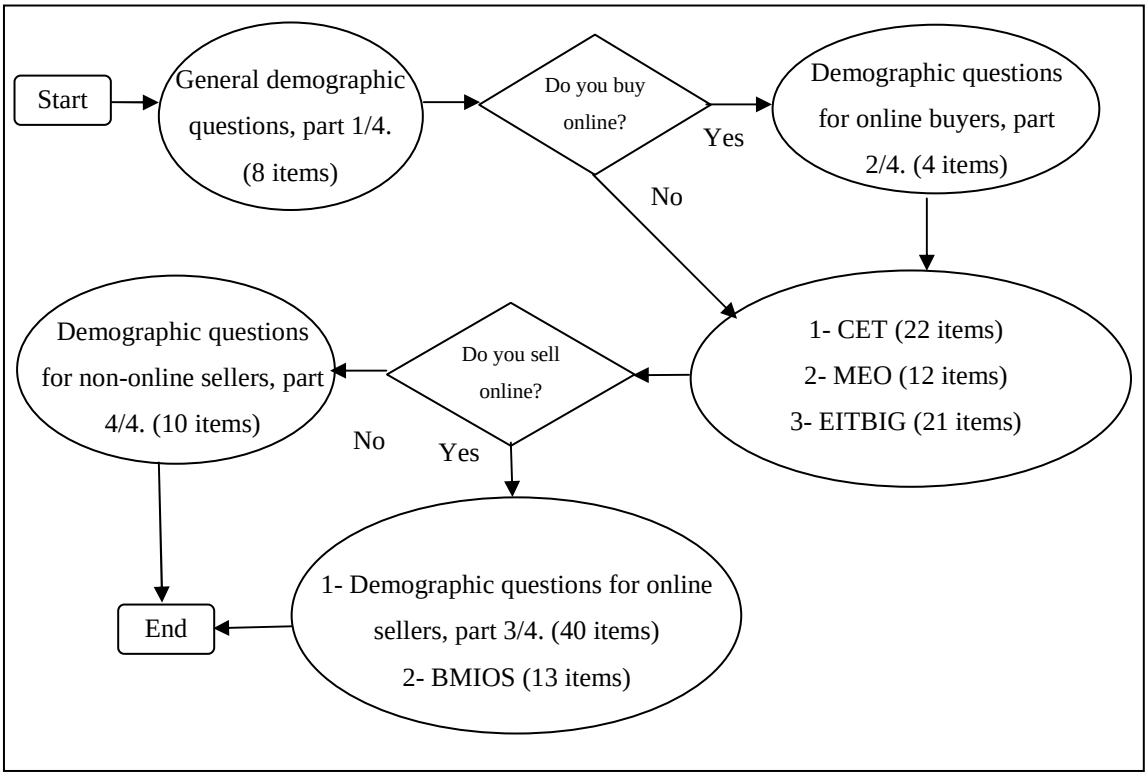


Figure 4.3: Flow chart for questionnaire administration.

Survey Components		Questions	Screens
Demographics	General	8	3
	Online buyers	4	2
	Online sellers	40	9
	Non-online sellers	10	1
Net-enablement	Choosing Enabling Technology (CET)	22	3
	Matching Economic Opportunities (MEO)	12	2
	Executing Information Technology as Business Innovation for Growth (EITBIG)	21	3
Business Model Innovation for Online Selling (BMIOS)		13	1
Total		**130**	**24**

Table 4.6: Web-based Survey Components

The last part addressed the research dependent variable, BMIOS and had 13 items, focused on changes firms made to ways of doing business to utilize the adopted online selling tools. See Figure 4.3 and Table 4.6 for scale logic, breakdown, and item details in this regard.

4.5.6 Response Rate

The survey was sent to 41,141 firms. Of these, 6,798 of the surveys were returned as undeliverable (e.g., wrong or expired email address). There were also 1,211 requests to unsubscribe. Thus, the number of delivered surveys totalled 33,132. The number of firms responding to the survey totalled 2,097 – a total response rate of 6.3%. This rate is relatively low, but consistent with the literature on the problem of low response rate; even this low of a response rate is higher than pen-and-paper, mail, and phone survey responses (e.g., Cook et al., 2000; Dillman & Bowker, 2001; Cobanoglu et al., 2001).

Every effort was made to increase the response rate. First, the invitation letter was personalized and included the receiver's name, company, and position. Second, two weeks after sending the invitation letter, a reminder letter was sent to those who did not respond. Third, people who declined to participate were asked to suggest a substitute participant from the same firm. This effort yielded sixty additional contacts. Fourth, additional information was given to respondents with concerns about the survey. I answered all 905 email requests for additional information.

Fifth, some email servers have a high security level and requested confirmation of sent invitation letters with a certain special response for the sent invitation letter to be accepted and delivered to the

targeted receivers. There were 32 confirmation requests, accomplished by re-entering a series of displayed visual characters or replying to a confirmation request email. When combined, these strategies increased the responses from an initial 1396 to the final 2097 (See Table 4.7 for details). Finally, as an incentive, participants had the option to receive a summary of the research findings (347 responded affirmatively).

Returned Responses	**W1**	**W2**	**W3**	**W4**	**W5**	**W6**	**W7**
Submitted surveys	1255 (60%)	1396 (67%)	1956 (93%)	1996 (95%)	2003 (96%)	2008 (96%)	2097 (100%)
Clicked	1461 (52%)	1733 (61%)	2000 (71%)	2790 (99%)	2803 (99%)	2818 (100%)	2826 (100%)
Un-subscribed	685 (57%)	906 (75%)	1186 (98%)	1191 (98%)	1209 (100%)	1209 (100%)	1211 (100%)
Delivery failure	5500 (81%)	5921 (87%)	6457 (95%)	6471 (95%)	6683 (98%)	6757 (99%)	6798 (100%)
Out of office	266 (49%)	282 (52%)	526 (97%)	545 (100%)	545 (100%)	545 (100%)	545 (100%)
Questions	477 (53%)	508 (56%)	820 (91%)	902 (100%)	902 (100%)	902 (100%)	905 (100%)
Redirected	18 (30%)	45 (75%)	60 (100%)	60 (100%)	60 (100%)	60 (100%)	60 (100%)
Confirmation requests	16 (50%)	29 (91%)	32 (100%)	32 (100%)	32 (100%)	32 (100%)	32 (100%)

Table 4.7: Types of returned responses (accumulated) over time: March 30 - May 17, 2010 (7 weeks). Vertical Line: indicates when the reminder was sent and where the majority of responses were collected.

Hair et al. (2000) indicate one disadvantage of an online survey is open to everyone; there is no practical way to restrict its open nature. To overcome this issue and identify duplications, the service

provider for this online survey used (i.e., surveygizmo.com) captured each respondent's IP address. The survey provider identifies if the respondent has completed the survey based on the link given in the invitation letter or accessed the survey directly. No evidence of duplications or uninvited responses was found.

4.5.7 Non-Response Bias

The total response rate for this study was 6.3%; more than 90% of the population and their responses were not represented. This issue is "non-response bias," and it addresses the bias effect of non-respondents on the results (Creswell, 1994). However, a low response rate does not necessarily mean that the data collected suffered from non-response errors; indeed, there is evidence that studies with very high response rates still suffer from non-response errors (Krosnick, 1999).

Researchers suggest performing wave analysis tests to assess how early respondents differ from late respondents. The assumption is that late respondents are similar to non-respondents (Armstrong & Overton, 1977). A wave analysis was performed between early (N=475) and late (N=336) respondents. Early respondents submitted their surveys in the first two weeks and before the reminder email. All other respondents were considered to be late respondents. The statistical analysis for the two groups showed differences in very few variables (var75, var126, var138, and var139).The remaining 51 variables showed no statistically significant differences. Overall, there were no significant differences between means and variances across the two, and this suggests that non-response bias did not influence the results of this study.

Lambert and Harrington (1990) found that the wave analysis technique, and its promise of equating late respondents with non-respondents, is a weak association test. Consequently, the results of the wave analysis reported in this research better reflect those who responded to the survey rather than those who did not respond. Further, wave analysis results do show that late respondents are more similar to early respondents than to non-respondents.

4.5.8 Missing Data

Of 2,097 collected responses, 969 cases have no data for the net-enablement 55 variables of concern or research model constructs of CET, MEO, and EITBIG. The remaining 1,128 cases displayed a variety of distributions of completed data for the variables, ranging from 641 cases with 100% of the variables having complete data, to 3 cases with 54 variables having missing values. All cases having more than 14 variables with missing values were deleted, a threshold of 25% of the total 55 variables as suggested by Hair at el. (2010).

Ultimately 811 cases were ready for analysis (i.e., usable response rate of 2.5%). Table 4.8 reports detailed information on the distribution of missing values, and Figure 4.4 illustrates a summary of the missing data. Further, Figure 4.5 shows the pattern of the missing values, i.e., the more variables answered, the more missing values that occurred, perhaps attributed to the length of the survey and the non-relevance of certain questions for some firms or sectors.

4.5.9 Data Imputation

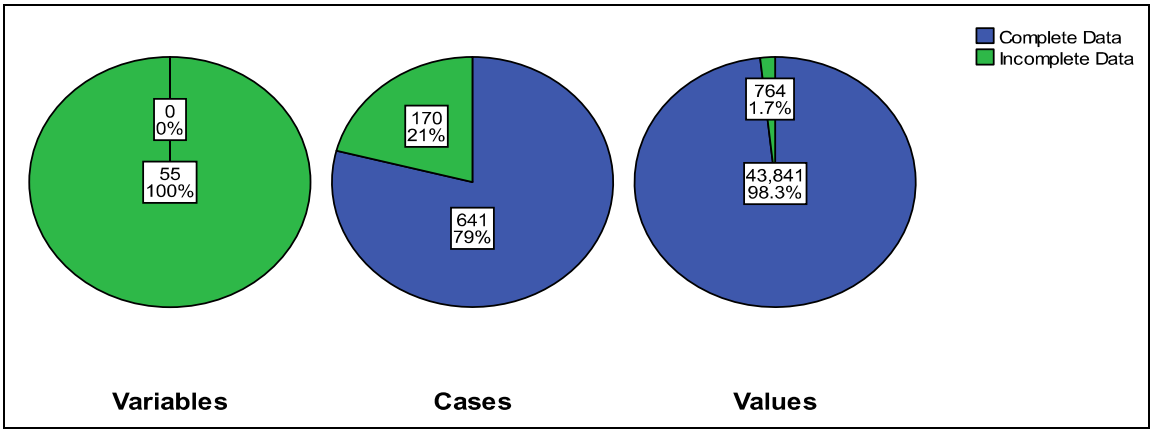
To impute missing data correctly, the randomness of the missing data patterns must be evaluated, particularly whether the data were “missing completely at random” (MCAR) or “missing at random”

(MAR). MCAR means that the missing data does not depend on other data values, and MAR means that the missing data depends on other data values (de Leeuw et al., 2008). MCAR is a requisite for consistent and unbiased imputed data. Using PASW 18 (previously called SPSS), Little's MCAR test was used to compare the actual pattern of the missing data and what was expected if this missing data were totally randomly distributed (PASW, 2007). MCAR is indicated by a non-significant statistical level, indicating the observed pattern does not differ from a random pattern.

# of missing values in variables from var72 to var139 (55 Variables)	Frequency	%	Cumulative %	% Variables w/missing (out of 55)
0	641	79%	79%	0%
1	81	10%	89%	2%
2	19	2%	91%	4%
3	3	0%	92%	5%
4	3	0%	92%	7%
5	3	0%	92%	9%
6	4	0%	93%	11%
7	14	2%	95%	13%
8	6	1%	95%	15%
9	4	0%	96%	16%
10	3	0%	96%	18%
11	1	0%	96%	20%
12	19	2%	99%	22%
13	6	1%	100%	24%
14	4	0%	100%	25%
Total	**811**	**100%**		

Table 4.8: Missing data distribution for the research model net-enabled constructs (CET, MEO, and EITBIG).

Figure 4.4: Overall summary of missing values.



Notes: 1- Each of the 55 variables had at least one missing value on a case.
2- The Case chart shows that 170 of the 811 cases had at least one missing value on a variable.
3- The Values chart shows that 764 of the 44,605 values (811 x 55) were missing.

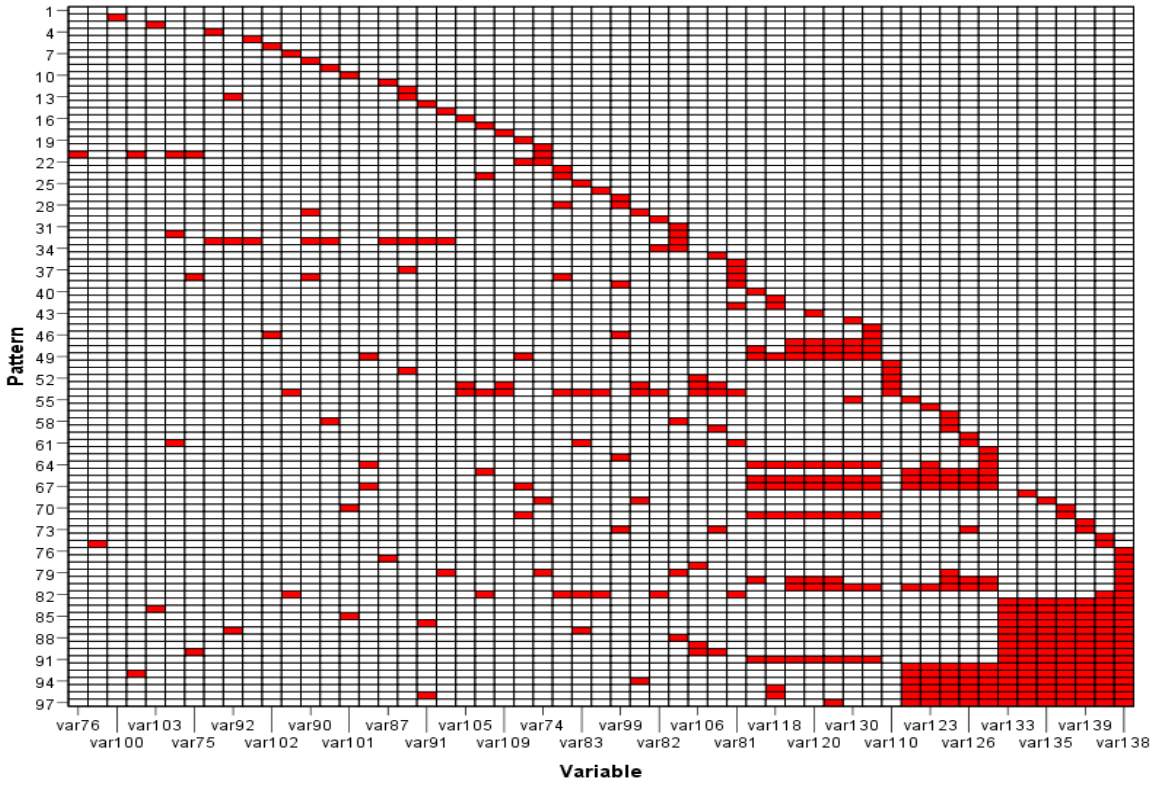


Figure 4.5: Missing value patterns.

Little's MCAR test was applied to the original data set of 811 cases, with a level of no more than 25% of missing values. The result showed that the data has a *p*-value of 0.526, df = 4885 and Chi-square = 4877.829, indicating a non-significant difference between the observed missing data pattern in the reduced sample and a random pattern. The data was missing completely at random; therefore, it is safe to either delete cases or singly impute missing values. The data imputation process was applied to all missing variables for the 811 cases using the Expectation Maximization (EM) imputation method, which maintains best representation of the original distribution of values with the least bias and prevents the loss of valuable data (e.g., Hair et al., 2010; PASW, 2007).

The imputation process concluded with a comparison of the original dataset (including the missing data values) and the imputed dataset (the complete dataset after imputation) using a t-test for equality of means and Levene's Test for equality of variances. The t-test showed a *p*-value with no less than 0.652, and the smallest *p*-value for the Levene's Test reported at 0.616.

Additionally, the data distribution and data median were visually examined using graphical data representation to check for any abnormality in the imputed data (Yockey, 2007; Hair et al., 2010). When assessing the "histogram" graphs, there was no extreme abnormality or key graphical differences in the shape of data distribution between the original dataset and the imputed dataset. The "boxplots" graphs indicate that in both the median and the distribution of the major portion of the data, there was no significant difference between the original dataset and the imputed dataset for each variable.

Label	Item	Mean	S.D.	Kurtosis	Skewness
	Identifying				
var72	Ability to gather business IT requirements from business IT users and managers	4.69	1.78	-0.46	-0.59
var73	Ability to collect information from external parties	4.72	1.62	-0.06	-0.71
var74	Ability to know about new IT requirements from emerging technologies vendors	4.84	1.67	-0.30	-0.66
var75	An established program to keep managers and employees abreast of IT-related developments and trends	4.13	1.88	-1.05	-0.23
var76	Interaction with vendors of IT solutions to keep abreast of new software services and related developments	4.32	1.80	-0.85	-0.38
	Assessing				
var79	Encourage employees to examine how new technology can be applied to their jobs	5.03	1.59	0.26	-0.89
var80	Conduct pilot projects to determine the impact of the new IT on business operations	4.31	1.79	-0.78	-0.36
var81	Gather information about competitors' performances with respect to new IT	3.92	1.81	-0.97	-0.16
var82	Gather information from partners and suppliers about the use of new IT	4.42	1.76	-0.70	-0.51
var83	Collect information from external experts regarding the application of new IT	4.53	1.70	-0.50	-0.61
var84	Gather information about government support programs with respect to the new IT adoption	3.43	1.85	-1.01	0.22
var85	Assess options for internal vs. outsourced IT solutions	4.54	1.84	-0.65	-0.55
	Filtering				
var87	Gather feedback from technology users, both external and internal	4.68	1.72	-0.29	-0.72
var88	Develop financial models of acquiring, implementing, and monitoring new IT	3.90	1.83	-1.00	-0.15
var89	Collect technical requirements of implementing new IT	4.43	1.79	-0.73	-0.48
var90	Collect feedback from pilot projects about new IT	4.15	1.83	-0.94	-0.43
	Reaching Conclusion (RC)				
var91	Implement clear objectives to select a specific IT solution	4.67	1.78	-0.45	-0.72
var92	Possess a formal process for approving new IT	3.95	1.91	-1.18	-0.19
var93	Evaluate IT software service providers' reliability	4.45	1.75	-0.67	-0.55
var94	Comply with legislation or industry standards in IT selection	4.14	1.90	-1.02	-0.26
var95	Evaluate new technology integration compatibility status with other applications already installed in the firm	4.59	1.73	-0.48	-0.64
var96	Influence of internal stakeholders on selecting a specific IT solution	4.84	1.73	-0.12	-0.80

Table 4.9: Items related to choosing enabling technology (CET)

As noted, a total of 811 valid responses were collected. Appendix 5 shows more details on the breakdown of the targeted sample and collected responses. Further, the 811 responses were filtered as online sellers (296 responses) and non-online sellers (515 responses). The online seller responses covered all the research model constructs (i.e., CET, MEO, EITBIG, and BMIOS). The non-online seller responses, covered only the net-enablement constructs of the model (i.e., CET, MEO, and EITBIG). Tables 4.9 through 4.12 list the construct item labels, wording, and descriptive analysis. Appendix 6 provides all demographic items.

Label	Item	Mean	S.D.	Kurtosis	Skewness
	Selecting Economic Opportunities (SEO)				
var98	Seek economic opportunities created or facilitated by new IT	4.74	1.64	-0.39	-0.60
var99	Seek IT solutions that create additional opportunities while solving existing problems	4.87	1.61	-0.21	-0.72
var100	Maintain a formal strategic plan that explicitly incorporates IT as a major component	4.18	1.91	-1.09	-0.27
var101	Evaluate multiple IT solutions that would possibly solve business problems	4.52	1.77	-0.70	-0.49
var102	Develop the firm's employees or clients (IT users) if outsourced to possess knowledge and experience with the new IT	4.65	1.73	-0.57	-0.59
var103	Ensure that customers possess knowledge and experience with IT	4.14	1.57	-0.52	-0.23
	Continual Dialogue and Sensemaking (CDS)				
var105	Employees maintain continuous interaction during the adoption process	4.83	1.67	-0.07	-0.80
var106	Managers clearly communicate the objectives and goals of the adoption	4.93	1.60	0.37	-0.96
var107	Employees use formal and informal communication during the adoption	4.89	1.60	0.35	-0.91
var108	Information exchanged among employees about the adoption is in easily understood language	4.90	1.59	0.19	-0.84
var109	Market information of the new IT adoption is organized in meaningful ways	4.43	1.60	-0.28	-0.48
var110	Technical information of the new IT adoption is organized in meaningful ways	4.48	1.62	-0.37	-0.48

Table 4.10: Items related to matching economic opportunities (MEO)

Label	Item	Mean	S.D.	Kurtosis	Skewness
	Project Management (PM)				
var116	The most recent IT project was completed on schedule	4.59	1.85	-0.86	-0.46
var117	The project was completed within budget	5.03	1.73	-0.25	-0.82
var118	The end product or service that was developed under this project works	5.37	1.64	0.69	-1.14
var119	Use of the recently adopted IT leads to improved decision making for our firm's top management	4.89	1.71	-0.17	-0.74
var120	The adopted IT exerted a positive impact on those who use it	5.32	1.61	0.84	-1.13
var121	You were satisfied with the process by which the project was completed	4.92	1.72	-0.09	-0.84
var129	Given a set of alternatives, this recent IT project that was developed was the best solution for the problem on hand	5.23	1.60	0.33	-0.95
var130	The results of this IT project represent a positive improvement on those who use it	5.39	1.62	1.12	-1.28
var131	The IT adopted by this project is used by those for whom it was intended	5.65	1.48	2.41	-1.55
	Employee Education (EE)				
var123	Existing skills of employees who participated in the recent IT project were identified and documented	4.29	1.74	-0.72	-0.39
var124	Employees received introductory training materials about the new IT project	4.70	1.69	-0.21	-0.72
var125	Employees received training about the new IT project implementation techniques	4.70	1.67	-0.16	-0.72
var126	Employees received assistance in determining strategic training needs for future projects	4.40	1.70	-0.60	-0.55
var127	Employees received support in an effort to attend training courses for future needs	4.35	1.75	-0.63	-0.47
	Creation of a Supportive Culture (CSC)				
var133	Managers stress quick response to changing market conditions	5.07	1.59	0.18	-0.88
var134	Our firm's management style encourages a high level of participation	5.57	1.43	2.22	-1.47
var135	Our managers are dynamic and entrepreneurial	5.66	1.45	1.79	-1.36
var136	Information is credibly and openly shared	5.65	1.44	2.32	-1.51
var137	Our managers emphasize innovation and change	5.57	1.49	1.56	-1.34
var138	There is a general feeling of trust and confidence among employees	5.71	1.45	2.59	-1.63
var139	Employees feel that their ideas and information are listened to by others	5.63	1.40	2.14	-1.45

Table 4.11: Items related to executing IT as business innovation for growth (EITBIG)

Label	Item	Mean	S.D.	Kurtosis	Skewness
var141	Improve products, goods, or services	4.12	2.20	-1.45	-0.20
var142	Increase sales channels	4.60	1.99	-0.91	-0.58
var143	Improve order placement procedures	4.58	1.96	-0.88	-0.55
var144	Increase delivery channels	4.14	2.08	-1.30	-0.26
var145	Expand firm's geographical reach	4.52	2.15	-1.16	-0.47
var146	Increase payment methods	4.84	2.04	-0.72	-0.75
var147	Improve firm's managerial control responsibility	4.27	1.95	-1.00	-0.43
var148	Improve technologies within the firm	4.82	1.78	-0.27	-0.79
var149	Decrease perceived risk associated with online selling adoption	4.00	1.93	-1.15	-0.16
var150	Increase sales volume	4.33	1.81	-0.79	-0.40
var151	Reduce operating costs	4.24	1.84	-0.97	-0.31
var152	Increase staff efficiency	4.40	1.85	-0.81	-0.50
var153	Reduce time-to-market	4.41	1.95	-0.93	-0.43

Table 4.12: Items related to business model innovation for online selling (BMIOS)

Having normal data distribution is an assumption in multivariate analysis, and violating this assumption can affect the statistical results. Researchers suggest checking whether survey items have extreme Kurtosis and Skewness to ensure normality (e.g., Diekhoff, 1996; Byrne, 2009; Hair et al., 2010). Kurtosis measures the flatness of the data curve, while Skewness tests the symmetrical shape of the data relative to the mean (Malhotra, 1996; Hair et al., 2010). Tables 4.9 through 4.12 show the imputed data as not exhibiting extreme abnormalities. The Kurtosis test returned values less than |3|. Further, the Skewness test returned values less than |2| and indicates that the data did not experiencing extreme Kurtosis or Skewness.

4.5.10 Descriptive Statistics

After data imputation, each imputed variable will have a value (i.e., there are no missing values). However, missing data was expected in the descriptive statistics of the following subsections addressing the general descriptive statistics of the collected firms and some specific findings for online sellers.

General Findings

The year in which the participating firms were founded varied from 1857 to 2010. The majority of the firms (68%) were established in the last 20 years. The median was 18.5 and the standard deviation was 19.1 years. The headquarters of the firms represented all the Canadian provinces as well as one territory. More than half of the respondents, however, were from Ontario. This could be attributed to Ontario's population and financial contributions compared to all the remaining Canadian provinces and territories. This means, however, that the findings could be biased toward Ontario firms. British Colombia, Quebec, and Alberta had the second, third, and fourth highest numbers of respondents, respectively. Even though the survey was in English, Quebec as a predominately francophone province contributed to about 12% of the total responses. This may suggests that the distribution of the survey in English only was not of a major concern evidenced by this reasonable responses form Quebec. See Table 4.13 for more details. The same table shows the distribution of the positions respondents held, revealing that the majority were principal owners of the firms. Further, the vast majority of the collected responses were from micro firms. More than 500 of the participating firms had less than 10 employees. This could bias the results toward smaller firms.

Item		Frequency	Percent
Year founded			
1857-1990		261	32.30
1991-1995		105	13.00
1996-2000		153	18.94
2001-2005		185	22.90
2006-2010		104	12.87
Total		**808**	**100.00**
Headquarters location			
AB		84	10.40
BC		107	13.24
MB		11	1.36
NB		14	1.73
NL		6	0.74
NS		20	2.48
NT		2	0.25
ON		412	50.99
PE		4	0.50
QC		98	12.13
SK		20	2.48
Non-Canadian		30	3.71
Total		**808**	**100.00**
Position			
CEO		114	14.1
Principal owner		342	42.4
President		164	20.3
General Manager		109	13.5
Staff/Employee		78	9.7
Total		**807**	**100.00**
Full-time employees			
Micro	Less than 10 employees	554	68.4
SME	11 - 19 employees	87	10.7
	20 - 49 employees	75	9.3
	50 - 99 employees	40	4.9
	100 - 299 employees	25	3.1
	300 - 499 employees	6	0.7
Large	Over 500 employees	23	2.8
	Total	**810**	**100.00**

Table 4.13: Demographic statistics

NAICS Code	Description	Non-Online Sellers	Percent	Online Sellers	Percent	Total	Percent
Sectors with above-average rates of online selling adoption							
31-33	Manufacturing	73	14.20	37	12.50	110	13.58
41	Wholesale Trade	20	3.89	16	5.41	36	4.44
44-45	Retail Trade	12	2.33	16	5.41	28	3.46
51	Information and Cultural Industry	22	4.28	24	8.11	46	5.68
61	Educational Services	16	3.11	29	9.80	45	5.56
71	Arts, Entertainment and Recreation	7	1.36	7	2.36	14	1.73
91	Public Administration	3	0.58	4	1.35	7	0.86
	Total	**153**	**29.77**	**133**	**44.93**	**286**	**35.31**
Sectors with below-average rates of online selling adoption							
11	Agriculture	8	1.56	6	2.03	14	1.73
21	Mining and Oil	6	1.17	2	0.68	8	0.99
22	Utilities	6	1.17	4	1.35	10	1.23
23	Construction	17	3.31	5	1.69	22	2.72
48-49	Transportation and Warehousing	13	2.53	6	2.03	19	2.35
52	Finance and Insurance	8	1.56	5	1.69	13	1.60
53	Real Estate and Rental	3	0.58	2	0.68	5	0.62
54	Professional	201	39.11	63	21.28	264	32.59
55	Management of Companies	15	2.92	10	3.38	25	3.09
56	Administrative and Support	4	0.78	0	0.00	4	0.49
62	Health Care	9	1.75	5	1.69	14	1.73
72	Accommodation and Food Service	1	0.19	1	0.34	2	0.25
81	Other Services	70	13.62	54	18.24	124	15.31
	Total	**361.00**	**70.23**	**163.00**	**55.07**	**524.00**	**64.69**
	Grand Total	**514**	**100%**	**296**	**100%**	**810**	**100%**

Table 4.14: Sector proportions for responses

Among the 811collected cases, there were 635 online buyers and 296 online sellers. The distribution of the collected responses reflected all Canadian sectors (see Table 4.14). From the non-online sellers' perspective, as expected, the majority of the respondents were from sectors with below-average rates of online selling adoption. About 40% of non-online sellers were from the professional, scientific, and technical sector. Greater than 14% of the non-online seller respondents, however, were from the manufacturing sector, which is generally classified as an above-average sector for online selling adoption. From the online sellers' perspective, more than half of the respondents were from sectors with below-average rates of online selling adoption.

Online Buyers	**Yes**	389 (48%)	246 (30%)
	No	113 (14%)	49 (6%)
		No	**Yes**
		Online Sellers	

Four-celled Table 4.15: Online buyer and sellers' contribution matrix.

The relationship between the online buyers' and sellers' responses is illustrated in the four-celled Table 4.15. This matrix shows that about half of the sample had online buying experience, but no online selling experience. Six percent of the sample, however, had online selling with no previous online buying experience. About one-third of the sample had both online buying and selling experience. When applying the test of association among the online buyers and sellers, the test produces Chi-square = 3.638 with *p*-value = 0.046 and df = 1. This suggests that there is a statistically

significant association between online sellers and online buyers. That is, online selling and buying are not independent from each other.

Table 4.16 shows the responses of online buyers to the question regarding the categories of items online buyers purchased. The majority of their purchases were software packages and office supplies.

Category*	**Frequency**	**Percent of Cases**
Software packages	514	81.5%
Office supplies	483	76.5%
Machines	233	36.9%
Component parts	224	35.5%
Raw materials	125	19.8%
Others	145	23.0%

Table 4.16: Categories of online purchases.
* Multiple answers allowed.

Non-online sellers identified the main factors preventing them from adopting online selling options. Their products or services were not suitable to be sold on the Internet, and they wanted to maintain their current business practices. Further, the speed of the Internet and the measure of "I do not know how to use the Internet to sell products/services" were reported to be factors that least affected a decision not to sell online (see Table 4.17).

Online Seller Findings

Table 4.18 shows some of the characteristics of online sellers. About 83% of the online sellers had their own website. More than 70% collected their purchase orders using their website and/or email. Very few received purchase orders from "online auction" websites. However, the majority of online

sellers had websites with brief information, lists of products/services, contact information, and email addresses. More than half of the online sellers accepted online payments.

Online Selling Adoption Barriers	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	Mean (#)
Products, services are not well suited to sale via the Internet	11.9	2.8	3.2	12.1	10.2	16.6	43.2	5.3
Prefer to maintain current business model (i.e., face-to-face interaction)	12.5	3.3	3.5	18.2	13	14.3	35	5.0
Loss of personal contact with customers	19.4	6.2	4.6	16.3	11.3	15.7	26.5	4.5
Insufficient level of customer demand for purchasing via the Internet	19.4	7.3	5.1	18.3	9.1	14	26.7	4.4
Customers are not prepared to transact online	21.4	10.4	6.4	22	9.7	13.2	17	4.0
Cost of implementing or maintaining online sales system is high	25.8	8.4	8.4	26	9.3	11.2	11	3.6
Security concerns	38.7	12	6.4	18.7	6.9	6.9	10.4	3.1
Employees are not ready to use Internet commerce	38	11.6	8.7	23.1	9.1	3.8	5.8	2.9
Don’t know how	45.6	12.3	4.9	21.7	7.2	2.9	5.4	2.6
Available Internet is too slow	53	14.9	4.7	16.9	3.6	3.3	3.6	2.3

Table 4.17: Responses of non-online sellers on barriers that prevented them from adopting online selling (1 = not important at all; 4 = neutral; 7 = very important).

Interestingly, about one-third of online sellers reported that online selling contributed less than 10% of their total sales, while more than 16% depended mainly on online sales (see Table 4.19). More than 91% of the respondents had participated in the online selling implementation process. Further, more than 95% of online sellers were managing their websites on their own, consistent with the findings that 83% received orders through their own websites and the respondents represented very small firms. The consistency in these results provide further evidence for the scale internal validity and consistency as these results represent different items distributed throughout the survey confirming

that answers were not arbitrary, as recommended by Campbell and Fiske (1959) and DeVellis (2003) and discussed in Section 4.5.1.

	Frequency	Percent of Cases
Categories of order placement*		
Your own website	242	82.6%
Email	221	75.4%
Others' websites	61	20.8%
Intermediary (agent)	53	18.1%
Industry portal	39	13.3%
Electronic Data Interchange (EDI)	29	9.9%
Online auction (e.g., eBay)	22	7.5%
Others	30	10.2%
Information included in online seller websites*		
Brief introduction and background about the firm	240	99.2%
List of products/services	222	91.7%
Contact information	211	87.2%
Email	203	83.9%
Online payment	140	57.9%
List of prices	116	47.9%
Business partners	100	41.3%
After sale services/follow-up	99	40.9%
Feedback from customers (reviews)	65	26.9%

Table 4.18: Categories of order placement and information included in online seller websites
* Multiple answers allowed.

Online selling adoption rates	Frequency	% of firms
0%-10%	92	32.74
11%-20%	39	13.88
21%-40%	57	20.28
41%-60%	27	9.61
61%-80%	21	7.47
81%-100%	45	16.01
Grand Total	**281**	**100**

Table 4.19: Percentage of online sales vs. total sales reported in Year 2009

For payment collection options, about 80% collected payments via offline payments, whereas 68% collected payments via online channels. Multiple responses were allowed for this variable, so this finding indicates that some firms use both online and offline payment options. When online sellers were asked about pricing options, more than 90% responded that they used a fixed pricing strategy. About 20%, however, used dynamic pricing for their products/services; again, multiple responses were allowed. Finally, to establish and use online selling options, 78% have changed their business process, 51% developed their staff skills, and 31% underwent organizational restructuring.

The previous results provide further support to the fact that no significant non-response bias was apparent. Consequently, the current research is unlikely to be significantly affected by non-response bias. However, it should be cautioned that all Canadian provinces and industrial sectors were not equally represented, and this may introduce different types of biases.

4.6 Conclusion

This chapter presented the multiple-method framework used in this research, and both exploratory and empirical research designs were supported by clear theoretical justification. In the exploratory stage, a scale was developed using ready scales from the literature or specific routines related to the research constructs and extracted from the literature. Next, the face validity of the scale was established via one-on-one email communication with online selling researchers, experts, and professionals. This segment concluded with a report on exploratory stage results, which both addressed the legitimacy of the research question and incorporated suggested modifications, deletions, and additions of items/wording.

The study's empirical stage then was addressed, including selecting sectors, firms, and key informants to justify use of the selected survey method and report the expected effects of both the common method and sample source biases. Then survey administration issues were reported. That is, 811 cases were collected representing a usable response rate of 2.5%. The required data imputation was performed and the final scale items with basic descriptive analyses reported. Complete details of the scale assessments, validations, and results are presented in Chapter 5.

Chapter 5
Findings

The objective of this research was to investigate the relationship between net-enablement capability based on the implementation of online selling tools and the innovation in business models needed to accommodate such implementation. Accordingly, the study used the NEBIC model as the primary theoretical framework and developed a construct to measure business model innovation for online sellers (BMIOS). The research developed a measurement instrument to validate the NEBIC model and the relationship between net-enablement capability for online sellers (as a prerequisite) and innovation in the business models (the dependent variable). The previous chapter described the multiple-method approach used to develop items for the survey (e.g., an exploratory stage and its detailed results). The chapter also discussed the empirical stage of the research (e.g., key informant use and its related CMV issue), independent variables expected to influence research results, the survey's response rate, and data validation.

This chapter begins with a brief description of the reflective state of the model, acknowledges the multi-dimensionality of its constructs and associated challenges, and then describes model analysis, validation, and assessment procedures. Both EFA and CFA were used to assess the model based on data collected from online sellers. While EFA identifies the number of underlying patterns of the dataset, CFA validates EFA results by assessing reliability and validity. Then, a full SEM analysis was conducted to assess the fit of the confirmatory dataset to the model and to validate research hypotheses H_2, H_3, and H_4. This discussion is followed by an evaluation of the multi-dimensionality of the model's constructs and the impact of the independent control variables on the results.

The level of development in the net-enablement capability of the model (CET, MEO, and EITBIG) is assessed for both online sellers and non-online sellers to examine the validity of the main hypothesis (H_1). The chapter concludes by revisiting and statistically evaluating the CMV.

5.1 The Reflective State and Multidimensional Nature of the Research Model

The current research model has reflective constructs. According to Hair et al. (2010), a reflective model is "based on the assumption that (1) latent constructs cause the measured variables and (2) the measurement error results in an inability to fully explain these measures" (p.691). From a theoretical perspective, the research model possesses the following characteristics:

1- Latent constructs,

2- Causal relationships between constructs and items,

3- Items that share a common theme within each dimension,

4- Items that are interchangeable within each dimension, and

5- Constructs with conceptual meanings that would not change by adding or deleting an item.

From an empirical perspective, the research model underwent the following assessment to be validated, as suggested by the theory developer, Wheeler (2002):

1- There are high positive correlations among constructs.

2- Cronbach alpha is used with related tests to assess the internal consistency and reliability.

3- There is agreement in sign and significance among all items of each construct.

4- Empirical tests for content, convergence, and other validity aspects are performed.

5- Factor analysis is conducted to identify measurement errors.

Researchers suggest that any construct that shares these theoretical and empirical characteristics is a reflective construct as opposed to a formative construct, a construct composed of independent items not interchangeable and causing the construct (e.g., Diamantopoulos & Siguaw, 2006; Coltman et al., 2008; Hair et al., 2010).

In addition, the current research model employs constructs with many dimensions, as theorized by Wheeler (2002) and discussed in Chapter 3. In the SEM, a multidimensional model requires a special hierarchal analytical technique called "second-order factor analysis" to address the characteristics of each dimension and improve both overall model validity and statistical results (Koufteros et al., 2009; Hair et al., 2010).

5.2 Factor Analysis

Factor analysis is used to discover the data structure and patterns between different variables by clustering data into fewer variables that share common variance. To examine and validate the research model, both Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were used. In addition, factor analysis is used to determine which items to delete or retain and check the discriminant validity of each survey item. To test the reliability of each construct, Cronbach's alpha is used to assess the model as suggested by many researchers (e.g., Kim & Mueller, 1978; Churchill, 1979; Hardesty & Bearden, 2004; Hair et al., 2010).

EFA identifies the underlying number of factors in each of the model constructs, as suggested by Tabachnick and Fidell (2007). For example, using EFA will test whether the CET construct consists of four factors as theorized. Kaiser eigenvalues are used to determine the number of factors to be identified. After identification of the factors for each construct by EFA, the resulting factors are tested using CFA. A SEM application, AMOS 18, was used to conduct CFA and confirm the identified constructs, factors, and theorized hypotheses and assess the structural model.

AMOS was selected over other SEM software programs (e.g., LISREL and EQS) as it has a very friendly and easy to use graphical user interface. AMOS features graphical representation that displays model specifications, equations, and path diagrams. Technically, researchers (e.g., Byrne, 2001; Clayton and Pett, 2008) found that the results produced by the different software programs are very similar. Even when differences occurred, the consequences of those differences are very minimal and did not affect the major findings. Thus, they suggest that the decision to select a specific program over others is mainly based on user experience and preference as well as the price of the program.

The online seller dataset of 296 cases (i.e., the dataset covers all the research model's constructs) was used to conduct both EFA and CFA. The dataset was randomly split into two datasets with $N_{EFA} = 148$ and $N_{CFA} = 148$, respectively to test the association between net-enablement constructs of the model (CET, MEO, and EITBIG) for online sellers and the innovation in business models to fully utilize the opportunities of implementing online selling tools.

5.2.1 Exploratory Factor Analysis

Exploratory factor analysis describes and summarizes data by grouping correlated variables to determine the number of factors underlying each construct (Tabachnick & Fidell, 2007). While it is a prerequisite for factor analysis to have correlation among the variables, multicollinearity is a problem with very strong correlations, making estimating regression coefficients impossible (Field, 2005). To measure this degree of intercorrelation, Bartlett's test of sphericity (*p*-value less than 5%) and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (KMO greater than 0.5) were utilized as suggested by Kaiser (1974) and Malhotra (1996). Further, Tolerance and Variance Inflation (VIF) test was applied to test multicollinearity (VIF values less than 10) as many authors recommend (e.g., Field, 2005; Hair et al., 2010). The results of the tests for each construct are in Table 5.1. There was sufficient evidence of intercorrelation among the variables. There was no VIF value exceeded 10 suggesting no evidence for multicollinearity. Consequently, there was intercorrelation, but not multicollinearity and appropriate to proceed with the EFA by calculating the average variance explained (AVE) by each construct. Table 5.1 shows that all AVE values are greater than 45% as suggested by Netemeyer et al. (2003), or grater than 50% as recommended by Hair et al. (2010).

Construct	Bartlett's Test of Sphericity (*p*-value)	KMO	AVE
Choosing Enabling Technology (CET)	<0.001	0.939	77.6
Matching Economic Opportunities (MEO)	<0.001	0.890	76.8
Executing IT as Business Innovation for Growth (EITBIG)	<0.001	0.937	76.2
Business Model Innovation for Online Selling (BMIOS)	<0.001	0.924	58.6

Table 5.1: Bartlett's, KMO, and AVE results for each construct (each scale) given by EFA.

The main purpose of EFA is to identify the factors inherent within each construct, so this research used the common factor analysis technique. Further, researchers suggest the use of EFA when the model possesses many factors and is based on theoretical assumptions and causal relationships among constructs (e.g., Costello & Osborne, 2005; Hair et al., 2010). Another technique is Principal Component Analysis (PCA), which concerns item reduction and identifying a parsimonious set of components accounting for the majority of the variability in the data (Freeze & Raschke, 2007; Hair et al., 2010). PCA is not suitable for this research, as this model means to identify the factors responsible for variability in the data collected, not to combine the factors.

The extracted factors are rotated to simplify understanding of the underlying structure. Oblique rotations were used to let the factors correlate as theorized in the research model, this technique is suggested by Costello and Osborne (2005) and Hair et al. (2010). The number of factors for each construct was determined by Kaiser eigenvalues greater than 1 (K1 criterion). Eigenvalues greater than or equal to 1 were needed to retain a factor and represent the amount of variance accounted for by a single factor. The results showed that choosing enabling technology (CET) had four factors, matching economic opportunities (MEO) possessed two factors, executing IT as business innovation for growth (EITBIG) possessed three factors, and business model innovation for online selling (BMIOS) possessed one factor. See Table 5.2 for more details.

Hayton et al. (2004) and Thompson (2004) criticized using the K1 criterion approach because the number of factors determined can be overestimated. They recommended Parallel Analysis (PA). According to Thompson (2004), the PA concept is based on comparing random with actual eigenvalues. While the actual eigenvalues represent the amount of variance accounted for by a single factor, the random eigenvalues represent values generated from randomized data for each factor.

Factors	Kaiser Eigenvalues Greater Than 1 (K1 criterion)		Parallel Analysis (PA)		
	Actual Eigenvalues	Retain	Random Eigenvalues	Actual Eigenvalues	Retain
Choosing Enabling Technology (CET)					
1	13.09	Yes	1.37	13.09	Yes
2	1.29	Yes	1.28	1.29	Yes
3	1.09	Yes	1.08	1.09	Yes
4	1.00	Yes	0.99	1.00	Yes
5	0.78	No	0.84	0.78	No
6	0.63	No	0.76	0.63	No
7	0.55	No	0.70	0.55	No
Matching Economic Opportunities (MEO)					
1	7.88	Yes	0.64	7.88	Yes
2	1.20	Yes	0.61	1.20	Yes
3	0.44	No	0.58	0.44	No
4	0.24	No	0.45	0.24	No
Executing IT as Business Innovation for Growth (EITBIG)					
1	12.39	Yes	1.36	12.39	Yes
2	1.67	Yes	1.13	1.67	Yes
3	1.47	Yes	1.05	1.47	Yes
4	0.79	No	0.91	0.79	No
5	0.57	No	0.79	0.57	No
Business Model Innovation for Online Selling (BMIOS)					
1	7.38	Yes	0.69	7.38	Yes
2	0.68	No	0.64	0.68	Yes
3	0.42	No	0.61	0.42	No

Table 5.2: Factors extracted from the research model constructs using the K1 criterion and PA approaches.

To retain a factor in the PA approach, actual eigenvalues should be greater than random eigenvalues. These results are presented in Table 5.2. The PA results show consistency with K1 criterion results except for BMIOS. Based on PA results, the BMIOS construct should possess two factors. However, as there is no theoretical support for the BMIOS construct to possess two factors and no additional differences in factors retained among other constructs, PA results will not be considered or further pursued in the following analysis.

5.2.2 Confirmatory Factor Analysis

Earlier, the factors of each construct were extracted using the first half of the dataset, N_{EFA}=148. Then CFA used the remaining dataset, N_{CFA}=148, to confirm EFA findings. SEM analytical technique was used to perform this CFA. According to Bagozzi and Yi (1988), Gefen et al. (2000), and Koufteros et al. (2009), the use of SEM is preferable in complex models, as it allows the researcher to assess and validate the proposed model in a single and standard way. In addition, SEM allows the researcher to assess the underlying structure and relationships between the collected data in a more effective manner, compared to traditional multivariate, multiple regressions, and linear relationship analysis (Chin, 1988).

Also, SEM provides indices for the data fit with the proposed model structure. According to Hair et al. (2010), SEM can test the constructs and their relationships and assess model reproduction for the observed covariance matrix and the significance of the proposed relationships, including testing the multiple relationships simultaneously along with testing useful statistical measurements for fit to evaluate the proposed model. The general rule is that if the proposed model shows a good fit and the proposed relationships are confirmed with significant coefficients, the model is supported.

This section addresses different aspects of CFA using the second half of the dataset, N_{CFA}=148. The following sections offer the reliability tests of all the constructs and factors. Convergent validity, discriminant validity, and goodness-of-fit analysis (GOF) are also assessed. Figure 5.1 illustrates a simplified version of the path diagram for the research model.

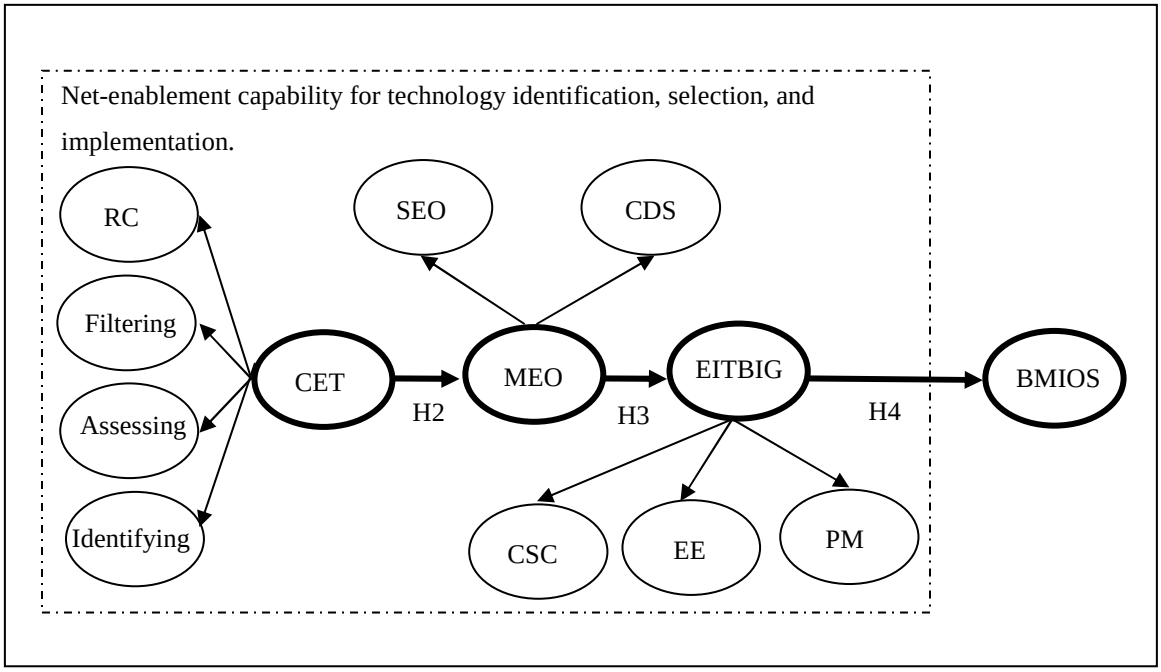


Figure 5.1: A Simplified Path Diagram of the Research Model.

* This figure does not include individual items, error items, and regression weights.

Running a factor analysis in AMOS 18 produced specific loadings for all items associated with the pre-specified factors of the model. As this stage is confirmatory, the significant distribution of item loadings over the factors helps confirm or refute EFA findings. The results are presented in Tables 5.3 through 5.6. All items that loaded less than 0.40 were excluded. Only one item was excluded from the CET construct, as its load was 0.234 (i.e., var96: Influence of internal stakeholders on selecting a

specific IT solution). All factors/dimensions demonstrated average variance explained AVE (noted at the bottom of each table) greater than 45%. All other items loaded well, confirming EFA findings and the theorized model.

Item	CITC	Loading			
		Filtering	Identifying	Assessing	Reaching Conclusion (RC)
var87	0.792	0.824			
var89	0.861	0.894			
var90	0.837	0.875			
var88	0.768	0.813			
var76	0.764		0.828		
var74	0.762		0.895		
var75	0.737		0.803		
var73	0.675		0.81		
var72	0.721		0.83		
var81	0.737			0.846	
var83	0.784			0.875	
var82	0.816			0.889	
var85	0.797			0.875	
var84	0.645			0.752	
var80	0.761			0.798	
var79	0.733			0.705	
var92	0.750				0.774
var94	0.766				0.741
var93	0.810				0.864
var91	0.811				0.88
var95	0.838				0.865
AVE	--------	**72%**	**66%**	**65%**	**70%**

Table 5.3: Corrected item-total correlation (CITC) and item loading for the Choosing Enabling Technology (CET) construct (21 items).

Further, corrected item-total correlation (CITC) analysis was performed with results showing no value less than 0.6 and indicating a high correlation between an item and the overall score of each construct, as suggested by Field (2005). Thus, each item is indeed consistent in measuring what all other items are measuring within the same construct.

Items	CITC	Loading	
		Continual Dialogue and Sensemaking (CDS)	Selecting Economic Opportunities (SEO)
var107	0.842	0.9	
var108	0.817	0.877	
var105	0.805	0.884	
var106	0.836	0.875	
var110	0.840	0.876	
var109	0.846	0.882	
var100	0.726		0.775
var101	0.819		0.879
var102	0.783		0.86
var99	0.818		0.892
var98	0.765		0.776
var103	0.603		0.634
AVE	--------	**77%**	**66%**

Table 5.4: Corrected item-total correlation (CITC) and item loading of the Matching Economic Opportunities (MEO) construct (12 items).

Items	CITC	Loadings		
		Project Management (PM)	Creation of a Supportive Culture (CSC)	Employee Education (EE)
var130	0.832	0.942		
var121	0.782	0.797		
var120	0.846	0.923		
var117	0.715	0.745		
var118	0.811	0.907		
var116	0.691	0.814		
var131	0.793	0.902		
var129	0.811	0.879		
var119	0.787	0.814		
var136	0.743		0.913	
var138	0.725		0.896	
var135	0.729		0.871	
var139	0.758		0.875	
var134	0.748		0.866	
var137	0.740		0.849	
var133	0.679		0.606	
var124	0.715			0.879
var125	0.742			0.882
var123	0.653			0.808
var126	0.708			0.855
var127	0.669			0.749
AVE	--------	**70%**	**73%**	**70%**

Table 5.5: Corrected item-total correlation (CITC) and item loading of the Executing IT as Business Innovation for Growth (EITBIG) construct (21 items).

Items	CITC	Loadings
var153	0.795	0.850
var151	0.769	0.820
var152	0.743	0.815
var147	0.766	0.795
var150	0.723	0.772
var144	0.732	0.745
var148	0.746	0.748
var149	0.674	0.722
var142	0.712	0.698
var141	0.668	0.698
var146	0.664	0.679
var143	0.686	0.680
var145	0.650	0.595
AVE	**--------**	**55%**

Table 5.6: Corrected item-total correlation (CITC) and item loading of the Business Model Innovation for Online Selling (BMIOS) construct (13 items).

5.3 Reliability Test

Many researchers (e.g., Nunnally, 1978; Bagozzi & Yi, 1988; Hair et al., 2010) suggest the use of Cronbach's alpha to test construct reliability and assess whether the measurement is consistent with what it is intended to measure. High correlation for the items is indicated by a high Cronbach's alpha value of 0.7 or greater.

Cronbach's alpha of each dimension of the constructs was assessed with results reported in Table 5.7. All had alpha values greater than 0.90, which indicates good accuracy of the measurement items in explaining the theoretical constructs. The measure is consistent in representing the same construct. Another reliability measure, Squared Multiple Correlations (SMC), assessed the measurement reliability, also called "item reliability," shows how well an item measures a construct and explains

the variance; the higher the value, the better the measurement (Gefen et al 2000; Hair et al., 2010). There is no recommended threshold value; however, the majority of the reported data reported are well above 0.5. Appendix 7 reports these details.

Constructs	Factors	Items	Cronbach's Alpha	# Items
Choosing Enabling Technology (CET)	Identifying	var74, var75, var76, var72, var73	0.918	5
	Assessing	var81, var82, var80, var83, var85, var84, var79	0.935	7
	Filtering	var87, var89, var90, var88	0.913	4
	Reaching Conclusion (RC)	var91, var92, var93, var94, var95	0.922*	5
	Overall		**0.973****	**21**
Matching Economic Opportunities (MEO)	Selecting Economic Opportunities (SEO)	var98, var99, var100, var101, var102, var103	0.915	6
	Continual Dialogue and Sensemaking (CDS)	var105, var106, var107, var108, var109, var110	0.955	6
	Overall		**0.955**	**12**
Executing IT as Business Innovation for Growth (EITBIG)	Project Management (PM)	var130, var121, var117, var120, var118, var116, var129, var131, var119	0.959	9
	Employee Education (EE)	var124, var125, var126, var123, var127	0.920	5
	Creation of a Supportive Culture (CSC)	var136, var138, var139, var135, var137, var134, var133	0.943	7
	Overall		**0.961**	**21**
Business Model Innovation for Online Selling (BMIOS)		var141, var142, var143, var144, var145, var146, var147, var148, var149, var150, var151, var152, var153	**0.940**	**13**

Table 5.7: Reliability coefficients.
* This value was (0.921) before deleting var96.
** This value remained unchanged after deleting var96.

5.4 Convergent Validity

According to Malhotra (1996) and Hair et al. (2010), construct validity is achieved by establishing face validity, convergent validity, and discriminant validity. Face validity was achieved in the exploratory stage of this research using judgment of experts. In this section, convergent validity is assessed. Discriminant validity is discussed in the following section.

Convergent validity is the extent to which indicators/items of a specific factor/dimension converge or share a high proportion of variance in common (Malhotra, 1996). Segars (1997) and Hair et al. (2010) suggest that all items should have a loading of at least 0.71 and an AVE of at least 50%. This is not meant to determine significance, but instead to exhibit convergent validity. Fornell and Larckner (1981), however, suggest accepting loadings greater than 0.5 and AVE of at least 50% to show convergent validity. As reported in Tables 5.3 through 5.6, all of the loadings were greater than 0.5, and all the AVE values were greater than 50%. Hox and Bechger (1998) recommended using the Critical Ratio (CR), calculated by dividing an item estimate by its Standard Error (SE) to test for convergent validity. The CR values should be greater than 1.96 or smaller than -1.96 to show significant convergence. Appendix 7 lists each item's CR and shows all values above the threshold value of |1.96|. Thus, the extant model exhibited convergent validity.

5.5 Discriminant Validity

Unlike convergent validity, discriminant validity is the extent to which a construct differs from other constructs, showing that the constructs possess distinction, and they are indeed uncorrelated (Churchill, 1979; Segars, 1997; Hair et al., 2010). According to Hair et al. (2010), to test for discriminant validity, all constructs should be allowed to co-vary. They suggest establishing a table of

all estimates. The diagonal should contain the construct variances, set to be equal to 1. All of the construct correlation estimates should be entered in the associated cells below the diagonal. All squared correlation estimates should be entered above the diagonal. All AVE values, when compared with the corresponding squared correlation estimates, should appear above the diagonal. To show construct discriminant validity, all AVE values should be greater than the squared estimates. Table 5.8 shows all the AVE values are higher than the corresponding squared correlation estimates (shown above the diagonal). Thus, the constructs have more in common with the construct they are associated with than they do with other constructs. The data subsequently exhibited discriminant validity.

	Choosing Enabling Technology (CET)	**Matching Economic Opportunities (MEO)**	**Executing IT as Business Innovation for Growth (EITBIG)**	**Business Model Innovation for Online Selling (BMIOS)**
AVE	**0.78**	**0.77**	**0.76**	**0.59**
Choosing Enabling Technology (CET)	**1.00**	0.70	0.39	0.08
Matching Economic Opportunities (MEO)	0.84	**1.00**	0.61	0.07
Executing IT as Business Innovation for Growth (EITBIG)	0.63	0.78	**1.00**	0.07
Business Model Innovation for Online Selling (BMIOS)	0.29	0.26	0.27	**1.00**

Table 5.8: Research model constructs' correlation matrix (covariance allowed) with associated AVE values.

Another measure to assess the discriminant validity is comparing CITC values, also called "point-biserial correlations." According to Guilford and Fruchter (1973) and Zimmaro (2003), CITC values equal to 0.4 and above indicate very good discrimination. Examining Tables 5.3 to 5.6, we see that all

CITC values are well above the threshold value of 0.4, indicating that the items indeed show discrimination across different factors. Both Segars (1997) and Widaman (1985) suggest comparing chi-square (χ^2) values of different models; discriminant validity is then evidenced in the model that shows lower chi-square values. This comparison is reported in the following section.

5.6 Hierarchical Analysis: Second-Order Factor Model and Goodness-of-fit Analysis

After verifying that the factors in CFA indeed match the number of factors given by EFA, the uni-dimensionality of the constructs are examined. According to Edwards (2001) and Koufteros et al. (2009), a second-order factor model paradigm is used in multidimensional factors (i.e., many distinct, but related, factors associated with one construct) to address the different dimensions of the model's constructs.

Compared to using the first-order factor model, Edwards (2001) and Koufteros et al. (2009) assert that using a second-order factor model has many advantages. First, it helps maintain the contribution weight of each factor in the associated higher-level construct. Second, it increases the clarity and precision of the research constructs as well as increases the variance explained by the model. Finally, the use of the second-order factor model improves the model's overall GOF and both the discriminant and convergent validities.

Because this research uses the NEBIC theoretical model, which hypothesizes multidimensionality of all of the model's constructs, the guidelines for developing a second-order factor model are used, as suggested by Edwards (2001) and Koufteros et al. (2009). Each construct of the research model was

analyzed hierarchically, a procedure recommended to develop the best-fitting model by using the second-order factor model paradigm to overcome the problem of unidimensionality.

There are four models of second-order factor hierarchal analysis of the CET construct offered in detail. The first presents the CET construct in a unidimensional form, followed by decomposition of the CET construct into its independent dimensions (Models 2 and 3). The last model presents the CET construct with its associated second-order factor (Model 4). A discussion of these four different models is based on an analysis of goodness-of-fit (GOF) for each model to assess the unidimensionality of the CET construct and consequently the appropriateness of the model. This second-order factor hierarchal analysis is repeatedly applied to the remaining constructs of MEO, EITBIG, and BMIOS and presented briefly.

5.6.1 Choosing Enabling Technology (CET) Construct

Figure 5.2 shows Model 1 of the CET construct with 21 observed variables/items (no correlation assumed), reflecting only one latent variable/construct and a first-order factor. Figure 5.3 presents Model 2 of the CET construct where each group of related items is categorized by the related latent variable. This model has four latent variables (i.e., identifying, assessing, filtering, and RC), representing a first-order factor model with no correlation presumed. In the third stage, correlations for the latent variables are introduced and shown in Figure 5.4. The last stage for CET construct hierarchical analysis introduces a second-order factor (i.e., CET) reflecting four first-order factors that in turn reflect the associated 21 items (see Figure 5.5).

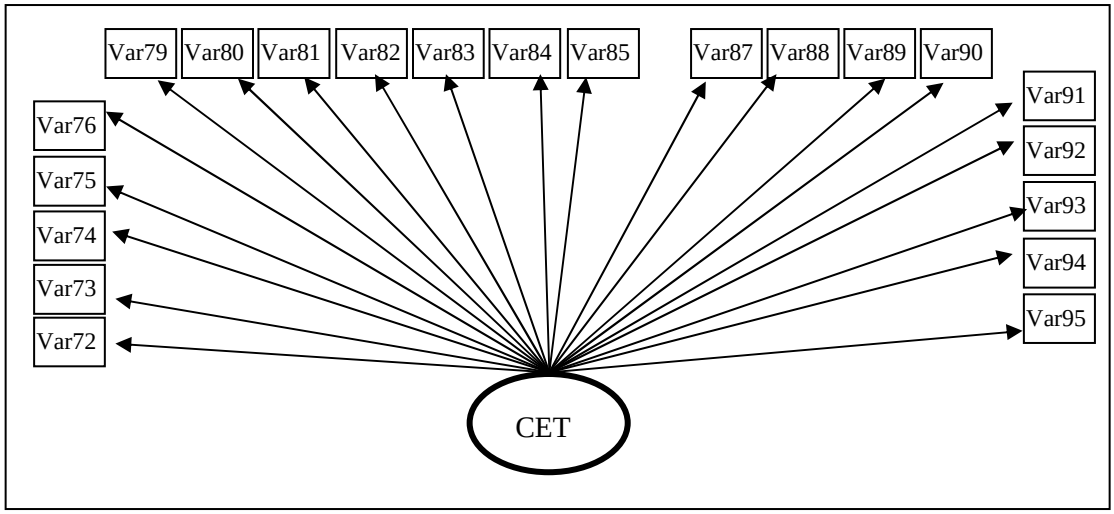


Figure 5.2: CET model with one first-order factor (Model 1).

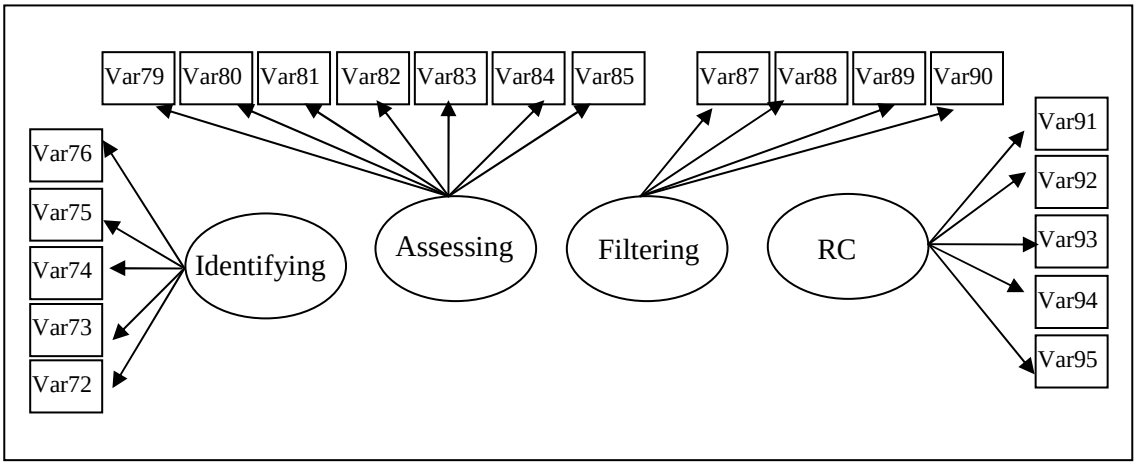


Figure 5.3: CET model with four first-order uncorrelated factors (Model 2).

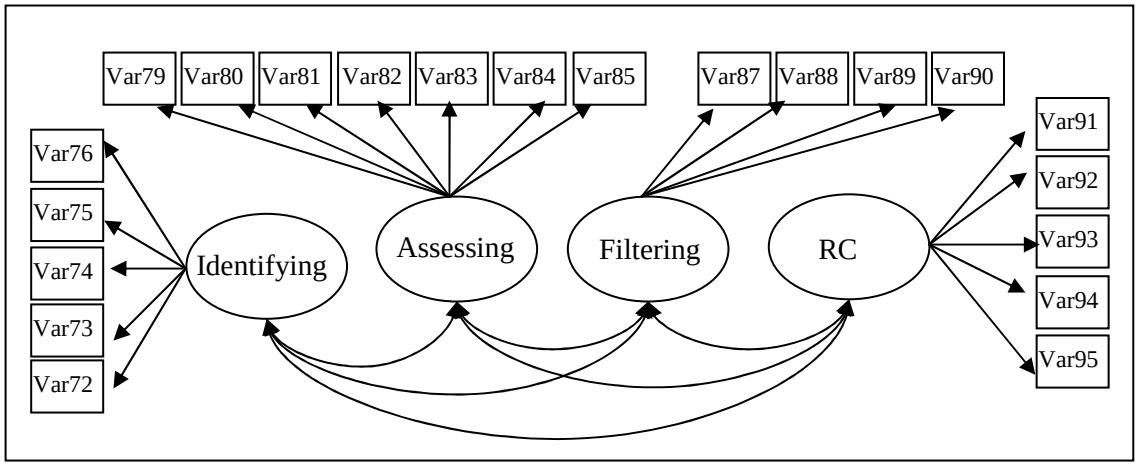


Figure 5.4: CET model with four first-order correlated factors (Model 3).

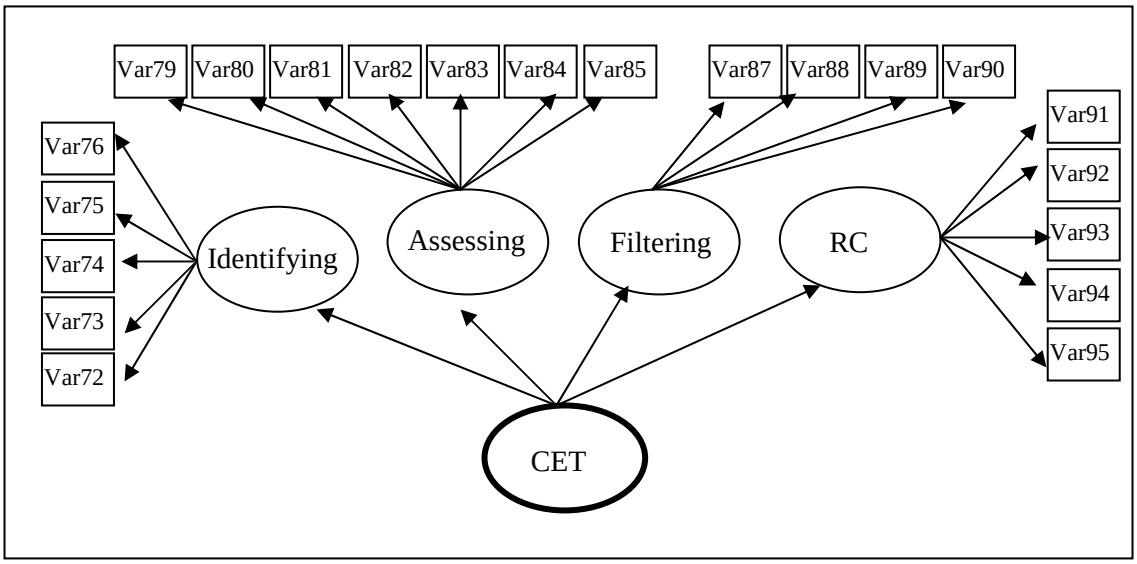


Figure 5.5: CET model with four first-order factors and one second-order factor (Model 4).

Comparisons of the four models are reported in Table 5.9, and the related threshold values are presented in Table 5.10. Hair et al. (2010) suggests using the GOF indices collectively to determine model fit. In general, the indices χ^2, CMIN/DF, RMSEA, CFI, and TLI for Model 4 show better values compared to the GOF values of Models 1, 2, and 3. Further, the GOF values of Model 4 show

a satisfactory fit compared to the threshold values presented in Table 5.10. Although Models 3 and 4 demonstrate very close GOF values, Model 4 is preferred over Model 3 because Model 3 permits covariances among constructs. These covariances can create issues of discriminant validity and multicollinearity, as warned by Koufteros et al. (2009). Thus, the second-order factor model (Model 4) in Figure 5.5 is more appropriate to use to explain the CET construct from both a practical and theoretical viewpoint. Accordingly, the CET construct consists of four dimensions, as theorized.

GOF Indices	Model 1 One first-order factor	Model 2 Four uncorrelated first-order factors	Model 3 Four correlated first-order factors	Model 4 Four first-order factors and one second-order factor
χ^2	721.60	1105.43	485	440.24
χ^2/DF or CMIN/DF	3.45	5.29	2.44	2.31
RMSEA	0.13	0.17	0.10	0.09
GFI	0.66	0.61	0.77	0.77
AGFI	0.59	0.53	0.71	0.72
CFI	0.84	0.72	0.91	0.92
TLI	0.82	0.69	0.90	0.90

Table 5.9: Comparisons of different model measurement fit indices for the Choosing Enabling Technology (CET) construct.

Improvement in χ^2 values, as the value becomes smaller, shows the discriminant validity of Model 4 as χ^2 reached its lowest value ($\chi^2 = 440.24$) compared with the competing models, as suggested by Segars (1997) and Widaman (1985). The variations in the overall GOF values for Models 1, 2, 3, and

4 show an additional convergent validity of the model as a variation uniquely accounted for by the factors (Widaman, 1985).

GOF Index	Label	Description & Rule of Thumb
χ^2	Chi-square	Measure of the difference between the observed (real) and estimated (theoretical) covariance matrices. The lower the value, the better the model (Diekhoff, 1996; Hair et al., 2010).
χ^2/DF or CMIN/DF	Generalized Likelihood Ratio	Compensates for sample size impact on χ^2 statistic. Values less than 3.0 indicate a good fit (Arbuckle & Wothke, 2004; Hair et al., 2010).
RMSEA	Root Mean Square Error of Approximation	Represents how the model fits a specific population. Values less than 0.10 indicate good fit (Hair et al., 2010).
GFI	Goodness of Fit Index	Less sensitive to sample size. Values greater than 0.90 indicate a good fit (Schumacker & Lomax, 2004; Hair et al., 2010).
AGFI	Adjusted Goodness of Fit Index	Adjust the GFI to assess a model's degree of complexity. Values greater than 0.95 indicate a good fit (Schumacker & Lomax, 2004).
CFI	Comparative Fit Index	Values greater than 0.90 indicate a good fit (Hair et al., 2010).
TLI	Tucker-Lewis Index	According to Schumacker and Lomax (2004), values close to 0.95 indicate a good fit. The closer the value to 1, the better the model fit (Hair et al. 2010).

Table 5.10: Fit indices and associated threshold values.

5.6.2 Matching Economic Opportunities (MEO) Construct

The same process applied to the previous CET construct was applied to the MEO construct. All of the related figures are presented in Appendix 8. It is evident from comparing the four models in Table 5.11 that the indices of χ^2, CMIN/DF, RMSEA, CFI, and TLI for Model 4 show better values

compared to the indices of Models 1 and 2. Further, the GOF values of Model 4 show a satisfactory fit compared with the threshold values presented in Table 5.10. Although Models 3 and 4 do exhibit nearly the same GOF values, Model 4 is preferred over Model 3 because Model 3 permitted covariances among constructs. As discussed earlier, this covariance can create issues of discriminant validity and multicollinearity. The second-order factor model (i.e., Model 4) was selected as the best representation of the MEO construct.

GOF Indices	Model 1 One first-order factor	Model 2 Two first-order factors uncorrelated	Model 3 Two first-order factors correlated	Model 4 Two first-order factors, one second-order factor
χ^2	738.82	323.40	193.41	191.34
χ^2/DF or CMIN/DF	13.68	5.99	3.65	3.55
RMSEA	0.21	0.18	0.13	0.13
GFI	0.64	0.77	0.82	0.82
AGFI	0.48	0.67	0.73	0.73
CFI	0.80	0.85	0.92	0.92
TLI	0.76	0.81	0.90	0.90

Table 5.11: Comparisons of different model measurement fit indices for the Matching Economic Opportunities (MEO) construct.

The smallest value of χ^2 was achieved in Model 4, suggesting that the model exhibits discriminant validity. The changes in the overall GOF values from Models 1 through 4 show the additional evidence for convergent validity of the model.

5.6.3 Executing Information Technology As Business Innovation for Growth (EITBIG) Construct

While the comparisons of the four models of the EITBIG construct hierarchal analysis are presented in Table 5.12, all related figures are found in Appendix 8. The GOF indices of χ^2, CMIN/DF, RMSEA, CFI, and TLI for Model 4 show better values compared with the indices for Models 1 and 2. Thus, the second-order factor model (Model 4) was selected to present the EITBIG construct. Consequently, the EITBIG construct had three dimensions, as theorized.

GOF Indices	Model 1 One first-order factor	Model 2 Three first-order factors uncorrelated	Model 3 Three first-order factors correlated	Model 4 Three first-order factors, one second-order factor
χ^2	1427.43	730.60	571.34	564.10
χ^2/DF or CMIN/DF	7.56	3.86	3.07	3.03
RMSEA	0.20	0.14	0.12	0.12
GFI	0.43	0.67	0.72	0.72
AGFI	0.33	0.60	0.65	0.66
CFI	0.63	0.83	0.88	0.88
TLI	0.59	0.81	0.86	0.87

Table 5.12: Comparisons of different model measurement fit indices for the Executing IT as Business Innovation for Growth (EITBIG) construct.

From a construct validity view, the improvement in χ^2 values among the competing models shows evidence of discriminant validity in Model 4 where χ^2 reached its lowest value ($\chi^2 = 564.10$). Further, the fluctuations in overall GOF values for Models 1, 2, 3, and 4 show additional evidence of model convergent validity because this variation is accounted for uniquely due to the factors.

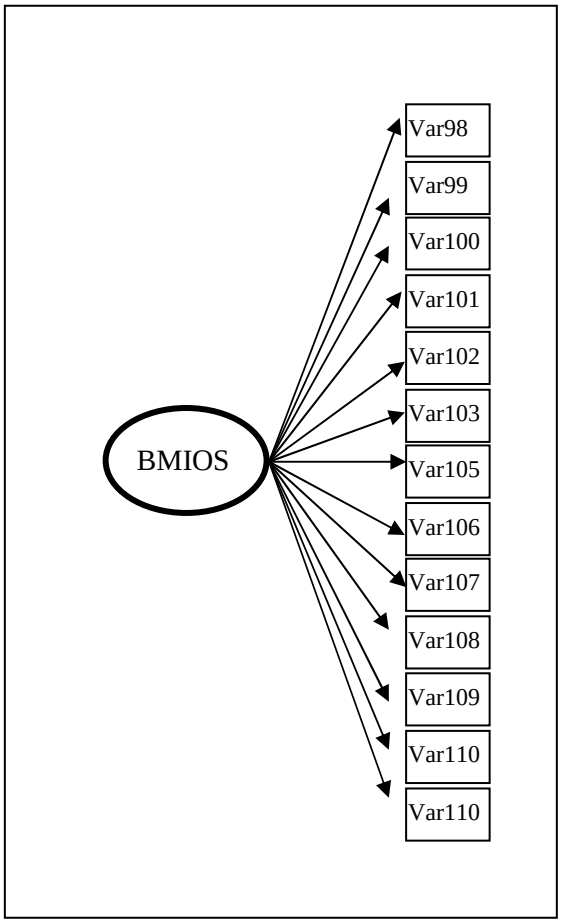


Figure 5.6: BMIOS model with a single first-order factor (Model 1).

5.6.4 Business Model Innovation for the Online Selling (BMIOS) Construct

Figure 5.6 shows the BMIOS construct. This construct has 13 observed variables and only one latent variable. In Table 5.13, the BMIOS model's GOF indices of χ^2, CMIN/DF, RMSEA, GFI, AGFI, CFI, and TLI show feasible values to conclude that a single first-order construct is appropriate to explain this factor.

GOF Indices	Model 1 One first-order factor	Model 2 First-order factors uncorrelated	Model 3 First-order factors correlated	Model 4 First-order factors, one second-order factor
χ^2	190.93	-	-	-
χ^2/DF or CMIN/DF	2.71	-	-	-
RMSEA	0.11	-	-	-
GFI	0.85	-	-	-
AGFI	0.79	-	-	-
CFI	0.91	-	-	-
TLI	0.89	-	-	-

Table 5.13: First-order factor model measurement fit indices for the Business Model Innovation for Online Selling (BMIOS) construct.

5.7 Structural Equation Modeling (SEM)

Once EFA identifies the dimensions for each construct, and CFA, GOF, and second-order factor hierarchical analyses validate those findings; SEM methodology tested the research hypotheses with respect to the relationship between each construct. The simplified model diagram and fit indices are shown in Figure 5.7. The χ^2 is 4,757.62 with 2,132 degrees of freedom (p-value < 0.05); the normal chi-square is 2.23. The model CFI is 0.87 with a RMSEA of 0.07. These diagnostics suggest that the model provides a reasonable overall fit.

The model was assessed for stability for the measured indicator, variables, and paths, using both path coefficients and the standard estimates. Appendix 7 shows the standard estimates of each path and the associated p-values for each item in the corresponding dimension, each dimension in the corresponding factor, and between the factors. As evidenced, all p-values were less than 0.001, and all the standardized path estimates were greater than 0.5 except for one explaining the relationship among EITBIG and BMIOS constructs (0.33). For details, see Table 5.14. The associated p-value, however, indicated that there is enough evidence to show that the path estimate differs from zero. Thus, hypotheses H_2, H_3, and H_4 are accepted because their estimates differ from zero. Overall, given that all the estimates are significantly different from zero and the model shows reasonable fit of the data, these results support the theoretical model.

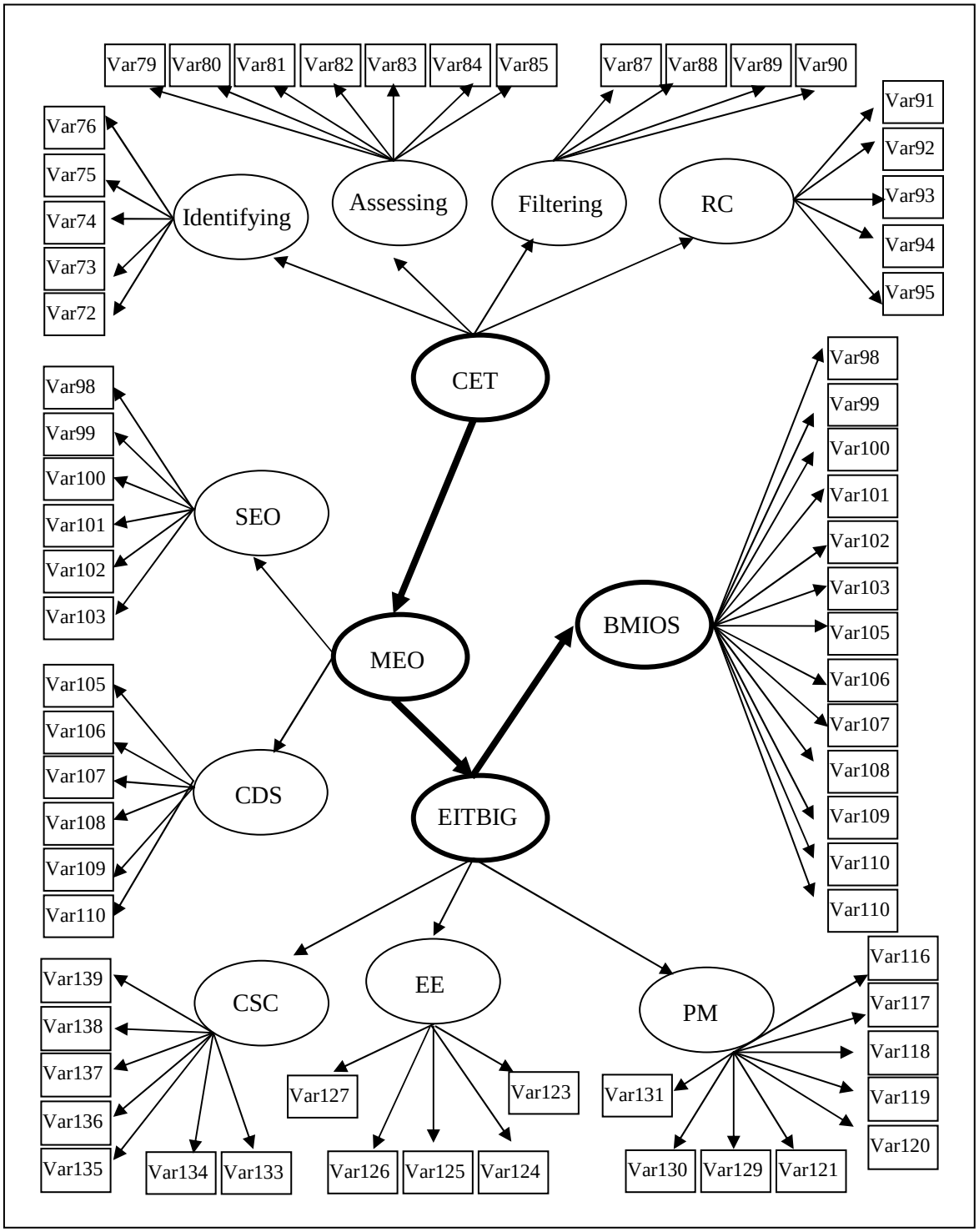


Figure 5.7: Research Model Simplified Path Diagram (χ^2=4757.62, χ^2/DF=2.23, RMSEA=0.07, GFI=0.67, AGFI=0.63, CFI=0.87, TLI=0.87).
* This figure does not include error items and regression weights.

Paths/Hypotheses	Standard Estimate	*p*-value	CR
MEO ← CET (H_2)	0.913	<0.001	10.211
EITBIG ← MEO (H_3)	0.882	<0.001	7.241
BMIOS ← EITBIG (H_4)	0.331	<0.001	3.44
Identifying ← CET	0.878	<0.001	10.942
Assessing ← CET	0.931	<0.001	12.845
Filtering ← CET	0.986	<0.001	13.919
RC ← CET	0.968	<0.001	Fixed
SEO ← MEO	0.967	<0.001	Fixed
CDS ← MEO	0.857	<0.001	9.785
CSC ← EITBIG	0.698	<0.001	Fixed
EE ← EITBIG	0.845	<0.001	6.978
PM ← EITBIG	0.848	<0.001	6.88

Table 5.14: SEM estimates.

Table 5.14 shows a positive relationship between the CET–>MEO; MEO–>EITBIG and EITBIG–>BMIOS constructs, supporting H_2, H_3, and H_4. For each one standard deviation increase in CET, MEO will increase by a standard deviation of 0.91. Also, as MEO increases by one standard deviation, EITBIG will increase by 0.88 standard deviations. The path between EITBIG and BMIOS, however, is a bit weaker. Each increase of one standard deviation unit in EITBIG is associated with a standard deviation increase of 0.33 in BMIOS. Even though this SEM analysis was conducted using the CFA dataset, the whole collected data (N=296) were also analyzed and the results show no appreciably different outcomes.

The modification indices (MI) suggest changes among model items to introduce additional relationships and gain a better fit with the data and show the extent to which the proposed model is appropriately described (Hair et al., 2010). The general rule of thumb indicates that absolute values of "Parameter Change" above 0.4 are a concern, and, as such, an extra path is needed. Results of this index show the need to add paths between certain items. The suggested items are already within the same construct and consequently assumed as correlated. It is also assumed that there is no additional explanation added to the model. Further, the model does not improve significantly in the GOF indices. Thus, there are no further paths added because there are no practical or theoretical implications from doing so, as cautioned by Garver and Mentzer (1999) and Hair et al. (2010).

5.8 Control Variables Analyses

This research anticipated that three independent variables could affect the dependent variable BMIOS as discussed in Section 4.5.4. Those variables were introduced to the model as three control variables: 1) the level of online selling (i.e., sectors with above-average vs. below-average of online selling adoption rates); 2) past experience with online buying; and 3) size of the firm. It was evident that past experience with online buying has a low negative effect of 0.13 ($p = 0.02$). All other control variables were insignificant with very low standardized path estimates as reported in Table 5.15.

Control Variables	**Standard Estimate**	***p*-value**	**State**
Level of Online Selling	-0.09	0.118	Reject
Online Buying Experience	-0.13	0.021	Accept
Firm Size	-0.01	0.864	Reject

Table 5.15: Assessing control variables effects on the dependent variable BMIOS.

5.9 Comparing Online Sellers to Non-Online Sellers For All Levels of Online Selling Adoption Rates

Even though this research mainly concerns online sellers, the collected data covers non-online sellers in order to help assess the prediction power of the model. The primary hypothesis in this research effort is that online sellers are expected to have a higher level of development in the net-enablement constructs as theorized in H1. According to Diekhoff (1996) and Hair et al. (2010), assessing the statistical differences between two sample means can be exemplified by using a t-test analytical tool, which is one of the tools for the analysis of variance (ANOVA) procedure. To compare the level of development in the shared capability of net-enablement (i.e., CET, MEO, and EITBIG), a t-test was used to statistically assess the difference in means between online sellers (N=296) and non-online sellers (N=515).

The t-test assumes equality of variances as a prerequisite (Diekhoff, 1996; Hair et al., 2010). To check variance equality, Levene's test for equality of variances was conducted first. These results indicated that variances differed from one construct to another. The threshold is p-value < 0.05 for the variances to be significantly different (Levene, 1960). The results in Table 5.16 indicate that the CET and the EITBIG constructs showed no statistical difference in variances while the MEO construct did.

Based on Levene's test results, t-test results should be assessed accordingly. All constructs of net-enablement (i.e., CET, MEO, and EITBIG) have a p-value of less than 0.05, indicating significant differences for the mean scores in all constructs between online sellers and non-online sellers. Further, each average score in all constructs was higher for online sellers than for non-online sellers, and this confirms H1, the primary hypothesis of this research.

	Levene's Test		t-test			Group Statistics	
	F	***p*-value**	**T**	**df**	***p*-value**	**N**	**Mean**
Choosing Enabling Technology (CET)	2.70	0.10 (*)	2.72	768	0.01	Online sellers	4.37
						Non-online sellers	4.08
Matching Economic Opportunities (MEO)	9.50	0.00 (**)	3.05	680.55	0.00	Online sellers	4.63
						Non-online sellers	4.31
Executing IT as Business Innovation for Growth (EITBIG)	2.24	0.13 (*)	3.17	768	0.00	Online sellers	5.13
						Non-online sellers	4.83

Table 5.16: Results for both Levene's test for equality of variances ($p < 0.05$) and a t-test for equality of means ($p < 0.05$) for the Net-enablement constructs between online sellers (N=296) and non-online sellers (N=515).
* Equal variances assumed

** Equal variances not assumed

5.10 Comparing Online Sellers to Non-Online Sellers in Sectors with Below-average Rates of Online Selling Adoption

In a comparison of online sellers to non-online sellers among all levels of rates for online selling adoption, it is useful to compare online sellers and non-online sellers in sectors with below-average rates of online selling adoption. This research initially expected differences between online sellers and non-online sellers in general as well as differences between sectors with above-average adoption

rates and sectors with below-average adoption rates. Again, this comparison was conducted on shared constructs of the research.

	Levene's Test		t-test			Group Statistics	
	F	***p*-value**	**T**	**df**	***p*-value**	**N**	**Mean**
Choosing Enabling Technology (CET)	2.12	0.15 (*)	2.27	522	0.03	Online sellers	4.46
						Non-online sellers	4.15
Matching Economic Opportunities (MEO)	9.16	0.00 (**)	2.86	372.50	0.01	Online sellers	4.74
						Non-online sellers	4.38
Executing IT as Business Innovation for Growth (EITBIG)	0.94	0.33 (*)	2.40	522	0.02	Online sellers	5.19
						Non-online sellers	4.91

Table 5.17: Results for both the Levene's test for equality of variances ($p < 0.05$) and the t-test for equality of means ($p < 0.05$) for the Net-enablement constructs for online sellers (N=163) and non-online sellers (N=361) in sectors with below-average rates of adoption.
* Equal variances assumed

** Equal variances not assumed

Table 5.17 shows the t-test results for comparing online sellers (N=163) and non-online sellers (N=361) within sectors characterized as having below-average rates of online selling adoption. The basic statistics and the results show that the average score in all constructs is higher for online sellers than for non-online sellers in sectors with below-average rates of online selling adoption. Further, all

the research constructs displayed statistically different means for online sellers compared with non-online sellers at a 0.05 level of significance. These results are consistent with previous results showing significant mean differences between online sellers and non-online sellers with higher mean scores for online sellers for all levels of online selling adoption rates.

Table 5.18 summarizes all of the extant research hypotheses and constructs dimensions as well as giving the results for the control variables analysis. Further, Figure 5.8 presents the final confirmed model for the current research.

Hypotheses	**State**
H_1: Online selling is positively associated with the level of net-enablement capability (represented by CET, MEO, and EITBIG constructs) development.	Accept
H_2: The CET construct is positively associated with the MEO construct.	Accept
H_3: The MEO construct is positively associated with the EITBIG construct.	Accept
H_4: The EITBIG construct is positively associated with the BMIOS construct.	Accept
Constructs Dimensions	
CET is a construct that consists of 4 dimensions.	Accept
MEO is a construct that consists of 2 dimensions.	Accept
EITBIG is a construct that consists of 3 dimensions.	Accept
Control Variables Analyses	
Different levels of online selling adoption rates are expected to affect the extent to which firms innovate their business models to accommodate online selling.	Reject
Different status of prior experience in online buying are expected to affect the extent to which firms innovate their business models to accommodate online selling.	Accept
Different sizes of firms are expected to affect the extent to which firms innovate their business models to accommodate online selling.	Reject

Table 5.18: Summary of the hypotheses tested and anticipated research outcomes.

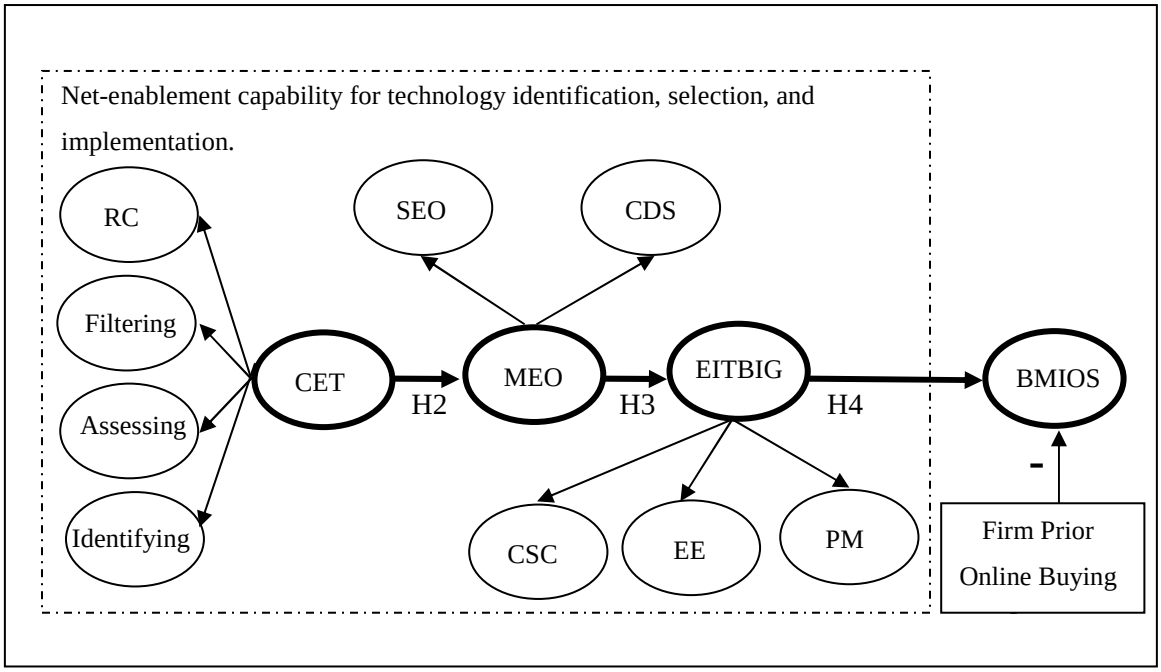


Figure 5.8: Research confirmed model of business model innovations for online selling.

5.11 Common Method Variance Assessment

Implemented procedural remedies to minimize the CMV effect were already discussed in Chapter 4, and a statistical remedy was implemented in the extant model as recommended and used by Podsakoff et al. (1990), Carlson and Kacmar (2000), and Podsakoff et al. (2003). Based on the decision tree developed by Podsakoff et al. (2003), the survey of this research was collected from a single informant, in a single context, and the source(s) of bias could not be identified. This combination of characteristics leads to the single-common-method-factor statistical approach becoming the best way to measure the effect of CMV in the current research.

Accordingly, a new latent variable (i.e., CMV) was introduced to the model discussed in the SEM section. CMV has all the model indicators (i.e., 67 observed variables) double-loaded on them. According to Podsakoff et al. (1990), addition of the CMV latent variable should control for any additional systematic variations common in the method used "(e.g., common rater bias, social desirability, 'yea-saying,' and so forth)" (p. 132).

From a practical standpoint, when the CMV variable was introduced to the model, AMOS did not fit the identified models. In SEM, according to Byrne (2009) and Hair et al. (2010), the model is unidentified when there are parameters estimated as being associated with insufficient information (i.e., input data). Podsakoff et al. (2003) warn of the problems associated with model identification whenever implementing this statistical remedy. AMOS thus forced to fit unidentified models to develop a running model with feasible results. AMOS provides a "check box" to activate the fitting of an unidentified model option. The activation of this option gives AMOS permission to estimate unidentified models and produce sub-optimal yet feasible (rather than optimal) solutions by constraining additional parameters.

As a result of constraining additional parameters, a working model was achieved, and the results for the new model (i.e., the model that includes the CMV latent variable) are presented and compared to the results of the original model (i.e., the model produced in the earlier SEM section). Tables 5.19 and 5.20 display these comparisons. The GOF results and AVE are both compared.

The GOF values for the new CMV model changed very slightly when compared to the GOF results for the original model. The chi-square value for the new CMV model, however, is worse (i.e., offers a higher value) than for the original model. Considering all the GOF indices together, including the

CMV variable, does not add greater explanatory power or change the overall results of the original model.

GOF Index	Original SEM Model	New CMV Model	Difference
χ^2	4757.62	5671.33	913.71
χ^2/DF or CMIN/DF	2.23	2.75	0.52
RMSEA	0.07	0.08	0.01
GFI	0.67	0.63	-0.04
AGFI	0.63	0.60	-0.03
CFI	0.87	0.82	-0.05
TLI	0.87	0.81	-0.06

Table 5.19: GOF Indexes for the SEM model before and after adding the CMV construct.

The AVE ratios can help assess whether the proportion of variance for each factor was inflated by CMV or not. Table 5.20 shows there is indeed one factor inflated by the CMV, that is, the Filtering dimension of the CET construct. The AVE of the Filtering dimension decreased from 72% to 51%. Still, the Filtering factor accounted for more than half of the variance extracted when CMV was controlled. Table 5.20 also indicates that all the remaining dimensions were either slightly inflated or not inflated at all.

Podsakoff et al. (1990) and Spector (2006) recommended including the CMV factor in a model can measure the difference in terms of the proportion of variance explained as accounted for by the CMV. They admitted, however, that including such factor will not eliminate or identify the source(s) of the variance. Indeed, including the CMV factor may not capture any same-source variance at all, and yet it may capture other systematic variances. Consequently, including the CMV factor in the extant model appears to exert but a minor impact on the model. Although the AVE results indicate that

CMV affected the variance, as explained by the Filtering factor, there were no other major issues introduced by adding the CMV factor. Thus, no further changes were applied to the research model.

Construct	Factor	AVE-Original	AVE-CMV	Difference
Choosing Enabling Technology (CET)	Filtering	72%	51%	21%
	Identifying	66%	63%	3%
	Assessing	65%	65%	0%
	Reaching Conclusion (RC)	70%	70%	0%
Matching Economic Opportunities (MEO)	Continual Dialogue and Sensemaking (CDS)	77%	73%	4%
	Selecting Economic Opportunities (SEO)	66%	65%	1%
Executing IT as Business Innovation for Growth (EITBIG)	Project Management (PM)	70%	69%	1%
	Creation of a Supportive Culture (CSC)	73%	66%	7%
	Employee Education (EE)	70%	66%	4%
Business Model Innovation for Online Selling (BMIOS)		55%	55%	0%

Table 5.20: AVE for the CFA model and after adding the CMV construct.

To check CMV further, Podsakoff and Organ (1986) and Podsakoff et al. (2003) asserted that CMV can be checked by using Harman's unrotated Single-Factor test where all of the studied items are subjected to EFA for factor identification. CMV is flagged if one factor is produced or one factor explains the majority of the variation in the data. Table 5.21 shows the results of Harman's test for the current research items. As displayed, the results revealed four distinct factors rather than a single factor. Collectively, these factors accounted for 65 percent of the total variance. However, the first factor accounted for 43.6 percent of the variance, but yet not the majority of the variance (i.e., that factor did not exceed 50%). Thus, there is neither a single factor produced from this analysis, nor did a single factor account for the majority of the variance. This finding suggests that CVM did not greatly affect the research results.

Harman's test, however, lacks enough sensitivity to detect moderate or small levels of CMV effects (Podsakoff et al., 2003). Further, Gorrell et al. (2011) criticized Podsakoff et al. (2003) for using Harman's test to identify CMV, deeming that test inappropriate. Originally, Harman's test was developed for factor identification purposes rather than a CMV test. According to Harman (1967), the role of the unrotated Single-Factor test is to check whether the data can be explained by only one factor with a good fit in the context of factor analysis. Thus, from this current analysis of CMV and the earlier one, the conclusion is that this research could indeed exhibit CMV, and yet this result would not critically change the overall research results.

Factors	Random Eigenvalues	Actual Eigenvalues	% of Variance	Cumulative %
1	2.624	29.668	43.630	43.630
2	2.467	7.178	10.555	54.185
3	2.277	4.701	6.913	61.098
4	2.201	2.657	3.907	65.005
5	2.138	1.898	2.792	67.797
6	2.053	1.663	2.445	70.242
7	1.972	1.408	2.071	72.313
8	1.924	1.084	1.595	73.908
9	1.886	1.043	1.534	75.442
10	1.736	.905	1.330	76.772
11	1.724	.871	1.280	78.052
12	1.697	.850	1.249	79.301
13	1.625	.804	1.182	80.483
14	1.571	.762	1.120	81.604
15	1.505	.724	1.065	82.668
16	1.481	.663	.974	83.643
17	1.435	.622	.915	84.557
18	1.382	.575	.845	85.402
19	1.354	.541	.796	86.198
...	...	...	...	...
...	...	...	...	...

Table 5.21: Harman's Single-Factor test (random vs. actual eigenvalues) for CMV verification purposes only.

5.12 Conclusion

This chapter introduced the reflective state of the model and acknowledged its multidimensional nature to justify the use of the second-order factor paradigm (Hierarchical Analysis Technique). The factor analysis, reliability test, validity assessment, and hierarchal analysis of the model were

described fully. A complete SEM assessment assessed overall GOF of the data for the model. The model was found to reasonably fit the data, and all relationships between the constructs were supported (i.e., H_2, H_3, and H_4).

This analysis was followed by a comparison of the average scores of online sellers and non-online sellers in the net-enablement constructs of the research model from two perspectives: Combining sectors having below-average rates of online selling adoption with those having above-average rates; and using only the sectors with below-average rates of online selling adoption. In both cases, online sellers scored higher than did non-online sellers across all net-enablement constructs of the model (i.e., CET, MEO, EITBIG), thus supporting H_1.

Assessing the control variables effects for the level of online selling, prior online buying experience, and firm size revealed useful information about their confirmed effects based on the data collected. Interestingly, not as anticipated, the level of online selling was not found to significantly affect the BMIOS construct. Another interesting finding was that while online buying experience was found to have a significant negative effect on the BMIOS, its standard estimate was very low. Finally, firm size was found have no effect on BMIOS.

The chapter ended with a statistical assessment of the possible effect of CMV on the research model. Two tests were used to assess and identify this issue. The results suggested that the model might be affected by CMV; yet this effect would not change the research results. Thus, the model does not exhibit extreme CMV.

Chapter 6
Discussion and Conclusions

This chapter discusses the results of the analyses presented in Chapter 5. It begins with a presentation of the conclusions for each of the four hypotheses, and is followed by a discussion of the theoretical and practical implications of this research. The chapter concludes with an agenda for future development and research and a discussion of the limitations of this research.

6.1 The Model Structure, Constructs, and the Hypotheses

As presented in Sections 3.5, 5.7, 5.9 and 5.10, this research developed and tested a total of four constructs and four hypotheses. Three of the constructs and hypotheses were based on Wheeler's (2002) NEBIC model of net-enablement. The fourth construct and hypothesis were based on the literature for the purpose of describing and understanding the relationship between technological implementation, net-enablement capability, and the associated innovation in business models for online selling. Other explanations, derived from the possible impact of different control variables in the research results, were presented in Sections 4.5.4 and 5.8.

Various statistical tools were utilized to test different aspects of the research model. Analysis of variance (ANOVA) was used to test H1 and to assess the level of development in net-enablement constructs (CET, MEO, and EITBIG) between online sellers and non-online sellers, as discussed in Sections 5.9 and 5.10. The results of this analysis confirmed H1, that online sellers were associated with better developed net-enablement capability. Consequently, it can be said that the model can

predict who will be the best candidate to adopt online selling based on levels of net-enablement capability development of each firm.

Structural equation-modeling (SEM) was used to test the remaining hypotheses. SEM is recommended for the singular standard assessment of a complex model with different structures and relationships, as discussed in Section 5.2.2. The hypotheses H2, H3, and H4 test the relationships between the research constructs and describe the relationship governing net-enablement capability as well as the outcome construct of business model innovation for online selling (BMIOS) – the model dependent construct. Finally, a specific technique called hierarchal analysis assessed the different dimensions of each construct. Table 6.1 summarizes these research results.

In the following subsections, the dependent construct of BMIOS is initially discussed, followed by the independent capability of net-enablement and its three constructs (EITBIG, MEO, and CET). The relationships between all constructs are then presented and evaluated.

6.1.1 Business Model Innovation for Online Selling (BMIOS)

According to many researchers, innovation in the business model is expected when a new technology is implemented for the firm (e.g., Schon, 1967; Teece et al., 1997; Ciborra, 2009) as discussed in Section 3.5.4. Further, this innovation in business model is a mediator between the technology implemented and the value created for customers (Chesbrough & Rosenbloom, 2002; Laugesen & Yuan, 2010). However, there is no empirical evidence or scales developed in the literature to measure the innovation in business model for online sellers.

Hypotheses	Standard Estimate	*p*-value	State
H_1: Online selling is positively associated with the level of net-enablement capability development.	NA	<0.05	Accept
H_2: The CET construct is positively associated with the MEO construct.	0.913	<0.05	Accept
H_3: The MEO construct is positively associated with the EITBIG construct.	0.882	<0.05	Accept
H_4: The EITBIG construct is positively associated with the BMIOS construct.	0.331	<0.05	Accept
Constructs Dimensions			
CET is a construct that consists of 4 dimensions.	NA	NA	Accept
MEO is a construct that consists of 2 dimensions.	NA	NA	Accept
EITBIG is a construct that consists of 3 dimensions.	NA	NA	Accept
Control Variables Analyses			
Different levels of online selling adoption rates are expected to affect the extent to which firms innovate their business models to accommodate online selling.	-0.09	0.118	Reject
Different status of prior experience in online buying are expected to affect the extent to which firms innovate their business models to accommodate online selling.	-0.13	<0.05	Accept
Different sizes of firms are expected to affect the extent to which firms innovate their business models to accommodate online selling.	-0.01	0.864	Reject

Table 6.1: Summary of confirmed hypotheses and research results.

Thus, the business model innovation construct for online selling (BMIOS) was developed under the assumption that an innovation in a business model is expected when online selling tool is adopted. This construct was designed to address the actual reconfigurations that happen in business models for

the adoption of online selling. Note that the adoption of online selling is the outcome technology of the preceding net-enablement capability of technology identification, selection, and implementation. The developed construct showed validity and reliability for capturing the innovations in business models associated with the adoption of online selling as discussed in Sections 5.2.1, 5.2.2, and 5.3-7.

When developing a construct, there are two views regarding its dimensionality. A construct can posses one or more dimensions. From the perspective of assessing the dimensionality of the BMIOS, the construct is theorized as possessing only one dimension in Section 3.5.4. The EFA (K1 criterion approach), CFA, and hierarchical analyses were consistent and confirmed the uni-dimensional nature of the BMIOS construct in Section 5.2.1, 5.2.2 and 5.6.4. However, the EFA (PA approach) analysis suggests that the BMIOS construct is actually multidimensional in Section 5.2.1.

Since there is no theoretical support for the multidimensionality of the BMIOS construct and the EFA (PA approach) findings contradict the other tests, the EFA (PA approach) results were ignored. In this initial step toward developing a scale to measure innovation in business models for online sellers, the developed scale showed reasonable validity and reliability. Accordingly, it seems that the BMIOS reasonably possesses one dimension. However, the developed scale may need to be tested in other contexts, such as a larger sample, or by using other statistical tools to further investigate the dimensionality of the BMIOS.

Table 4.12 in Section 4.5.9, reports all items identified and tested to measure the different innovations in business models of online sellers and accommodate the new requirements of online selling tools. As an implication of the identified items, all online sellers underwent changes in their operations and activities to accommodate the adoption of online selling and utilize its potential opportunities. These

innovations include increasing payments options, targeting new markets, and enhancing their products and service to suit the online context.

6.1.2 Common Themes for Constructs of Net-Enablement Capability

The capability of net-enablement has three constructs: Choosing enabling technology (CET), matching economic opportunities (MEO), and executing IT as business innovation for growth (EITBIG). They have two common themes, namely, they measure the ability of a firm to identify, select, and implement a technology by utilizing a firm's digital networking resources, and secondly, the three constructs describe both online sellers and non-online sellers in the general context of technology adoption.

First, the CET, MEO, and EITBIG constructs were adopted from Wheeler's (2002) NEBIC theory as presented in Sections 3.4-5. These constructs incorporate aspects of both the dynamic capability and absorptive capacity theories. From the dynamic capability perspective, the constructs accommodate items to measure a firm’s ability to use its resources to innovatively respond to the changing business environment. From absorptive capacity perspective, the CET, MEO, and EITBIG constructs relate the innovative response to the business environment with prior-related knowledge and expertise allocated inside the firm.

The constructs CET, MEO, and EITBIG were tested as one shot in this research and confirmed all associated theoretical aspects. However, the reality of these three constructs in the business environment is much more complicated. In real life, the net-enablement constructs represent an ongoing process of collecting and prioritizing information about technology adoption that would create value for customers and allow the firm to grow. For example, the construct of executing IT as

business innovation for growth (EITBIG) is actually a function of the overall development of the firm from different perspectives, such as employee expertise and training, different technological infrastructures, and the availability to support management and culture for innovation. These perspectives are developed over time and not in one motion. One practical implication of acknowledging that net-enablement constructs are not a one-step process is to advise the owners of firms that these constructs are developed on an ongoing basis. Further, these constructs are highly dependent on the type of employees recruited and the business culture that supports sharing information and appreciates new idea generation.

Second, unlike the BMIOS construct, the three constructs of net-enablement capability were examined using data collected from both online sellers and non-online sellers. It was empirically found that net-enablement constructs were better developed among online sellers than non-online sellers across all sectors and all levels of online selling adoption rates as presented in Sections 5.9 while yet theorized in Section 3.5. In Section 5.10, this finding was further assessed within sectors with below-average rates of online selling and found to be consistent. That is, online sellers scored higher in the CET, MEO, and EITBIG constructs compared with non-online sellers. The implication of this finding suggests that the net-enablement constructs seem better developed for online sellers, regardless of the sector level of online selling adoption. This finding suggests that non-online sellers might need to think, among other criteria, about developing their net-enablement capability to improve their process of technology identification, selection, and implementation to select the best technology innovation, such as online selling to achieve business growth by successfully selling their products or services online.

6.1.3 Executing Information Technology as Business Innovation for Growth (EITBIG)

This construct describes the ability of a firm to successfully implement the new technology proposed in the preceding MEO construct. For the firm to achieve technology implementation adequately, this construct was theorized in Section 3.5.3 to have three dimensions, namely, project management (PM), employee education (EE), and creation of a supportive culture (CSC).

The empirical assessment of the dimensionality of this construct showed consistent results. All the analyses tools of EFA, CFA, and hierarchal analysis presented in Sections 5.2.1, 5.2.2, and 5.6.3, respectively, confirmed that EITBIG indeed consists of three dimensions. In addition, these results suggest that the confirmed three dimensions are indeed the best fit for the construct.

Project Management (PM)

PM is an essential part of any technology execution process. It affects every aspect of the technology implementation process, including the reconfiguration of products, services, and more. The complexity of PM nature can be observed in the needed interactions among different employees, different departments, and different managerial levels within the firm and, in some cases, with other external parties (Wheeler, 2002; Alojairi & Safayeni, 2012). According to Cook (2004), the process of PM assessment should include such factors as top management support, availability of qualified employees, and available quality control at each stage of the project.

Table 4.11 in Section 4.5.9, reports all validated and confirmed items to measure the PM ability of a firm as perceived by the respondents. Employees characterized successful PM for technology

adoption by actual utilization of the technology adopted by the intended members. Also, the adopted technology achieved the purpose originally proposed.

Employee Education (EE)

The second dimension in the EITBIG construct measures employee level of readiness to tackle the execution process of the proposed technology adoption. This process includes different types of assistance employees receive as well as the level of clarity in communicating the project objectives (Cook, 2004). Table 4.11 in Section 4.5.9, reports all items were deemed valid to measure EE, confirming that successful technology execution is positively associated with better employee training and participation.

Creation of a Supportive Culture (CSC)

A supporting culture for change within a firm is a prerequisite for successful technology execution, product innovation, and consequently, business growth. When there are tensions, rigidities, and no appreciation of new ideas, generation of innovative ideas shrinks and may negatively affect a firm's growth. Accordingly, supportive culture is an environment that encourages sharing information and appreciates innovative ideas received from employees, as many researchers suggested (e.g., Cameron & Quinn, 1999; Menon et al., 1999; Alojairi & Safayeni, 2012). In this research, firms that enjoy CSC demonstrated the items presented Section 4.5.9 (Table 4.11). Supportive culture is associated with the encouragement, appreciation, and information sharing by managers with employees.

6.1.4 Matching Economic Opportunities (MEO)

MEO concerns the ability of a firm to associate the potential benefits of the recommended technology with the possible opportunities that can be created. This construct possesses two dimensions, namely, selecting economic opportunities (SEO) and having continual dialogue and sense-making (CDS), as theorized in Section 3.5.2. The two dimensions of this construct were validated and confirmed in Sections 5.2.1, 5.2.2, and 5.6.2.

Selecting Economic Opportunities (SEO)

This dimension addresses the firm's ability to create strategic options and business value from the proposed technology adoption and maintain business growth (Wheeler, 2005). According to Christensen et al. (1994) and Corbett (2002), many factors offer potential effects on the process of SEO, including environmental changes, the firm's learning curve, and the availability of strategic planning for growth. Further, Singh (1998) identified sources for opportunities, such as technology developments and changes in consumers' economics and social values.

The validated items for this dimension are presented in Section 4.5.9 (Table 4.10). Participants perceived that considering an IT solution while solving business problems was the most important factor affecting the decision of selecting the appropriate technology for the firm. In addition, they agreed that relevant IT knowledge and training is a contributing factor to making the decision on the best IT that best fits both current and future business needs. That is, how can one decide on the potential benefits of a proposed technology without actually knowing about it?

Continual Dialogue and Sense-making (CDS)

Maintaining effective formal and informal communication within the firm and with other parties external to the firm is the core of this dimension. The process of CDS improves the understanding of how others adopted the proposed technology and what challenges and benefits should be expected from the proposed technology when it is actually implemented in the current firm. This information should be shared and communicated effectively with all involved parties (Menon et al., 1999; Wheeler, 2002; Akgun et al., 2006).

This dimension includes the validated and confirmed measurement items listed in Table 4.10 (Section 4.5.9), which confirm the importance of communicating the advantages of the proposed technology to the associated employees. These advantages need to be investigated and the associated benefits confirmed, using different internal and external channels.

6.1.5 Choosing Enabling Technology (CET)

CET is the first and the independent construct for net-enablement capability of the research model. The construct concerns the activity of identifying one or more technologies for possible adoption, as discussed in Section 3.5.1. CET possesses four dimensions, namely, identifying, assessing, filtering, and reaching conclusions (RC) all empirically confirmed in Sections 4.5.9 (Table 4.9), 5.2.1, 5.2.2, and 5.6.1.

Identifying

The dimension of identifying new technologies is part of the CET construct. Williams (2004) further developed this dimension to include clearer and more-specific items, such as building user

relationships, monitoring of technology advances, and sharing information with vendors. In this study, these items were transformed into measurable scales.

The confirmed items suggest that seeking information about new technology from different internal and external sources is critical for identifying potential technology for possible adoption. Also, these items suggest that the level of training and knowledge about new advancements in technologies has a significant impact.

Assessing

This dimension addresses the evaluation process of a technology and the roles of different parties within the firm to achieve the technology assessment task (Wheeler, 2002). Williams (2004) qualitatively found that this "assessing" dimension consists of tasks like performing limited tests on the new technologies introduced to the market and sharing and collecting information about the use of these new technologies by other partners and competitors. The current research findings developed, tested, and confirmed these tasks.

Filtering

This third dimension of CET was theorized to assess the process of prioritizing different technologies and under various criteria (Wheeler, 2002). According to Williams (2004), five items contribute to the filtering process: Stakeholder pressure, user input, cost of the technology, pilot trial results, and technical requirements needed for the new technology to be able to fit into the firm's business environment. The research transformed these items into measurable items. These items were then validated and confirmed.

Reaching Conclusions (RC)

This is the last dimension contributing to the CET construct as theorized by Wheeler (2002). It assesses a firm's ability to strategically select a specific technology that will enhance the firm's operations and extend its business. Williams (2004) found that vendors, partners, and stakeholders exert influencing power on reaching a decision regarding the possible implementation of a technology. The validated items show the influence of different parties on the decision to select a specific technology for further assessment. Those parties include internal stakeholders and the feedback provided by IT experts.

6.1.6 The Relationships Among CET, MEO, EITBIG, and BMIOS Constructs

This research is based on four hypotheses theorized in Section 3.5. These hypotheses describe the interacting relationships among the constructs of the research model. The first hypothesis describes the overall impact of net-enablement capability on online selling tools implementation as planned business innovation to achieve growth. Two hypotheses describe the internal relationships between the net-enablement constructs. The last hypothesis describes the impact of net-enablement capability on the innovation in business models for online sellers.

The first hypothesis states that online sellers are associated with better-developed capability of net-enablement. A t-test to assess the level of development of net-enablement between online seller and non-online sellers was used in Sections 5.9-10. The reported results show that indeed online sellers, regardless of their level of adoption across sectors, are significantly associated with better- developed net-enablement capability for technology identification, selection, and implementation. Online sellers utilize their digital networks in a better way than do non-online sellers. Consequently, online sellers

successfully adopt the online selling, which is an example of technology innovation that can help maintain business growth. Online selling is assumed to be a technology innovation, as it is relatively new and not a widespread technology compared with other older and more widespread information and communication technologies, such as general Internet use and online buying.

The second hypothesis describes the relationship between the CET and MEO constructs and suggests that CET has a positive impact on MEO. That is, a good selection and proposal for technologies is useful for the proceeding construct of MEO to further assess that proposed technology. This relationship was examined and validated in Section 5.7 and found to be very strong and significant where an increase by one unit in the CET is associated with an increase in MEO by 0.913 units.

The third hypothesis is about the relationship between MEO and EITBIG constructs. A strong MEO construct should produce strategic options and required changes needed for the new technology and then deliver this information into the EITBIG construct. The findings found that MEO is a strong and significant predictor for the EITBIG with a standardized regression weight of 0.882 as presented in Table 6.1. Thus, for each unit of development exerted on MEO, there is an associated 0.882 unit of development in the EITBIG.

The fourth hypothesis describes the relationship between EITBIG and BMIOS for online sellers and in an online selling context. The development of this relationship was based on the argument that associates implementing a new technology, as a requisite, with the need to reconfigure a firm's business model as discussed in Section 3.5.4. Accordingly, this research theorized a positive relationship between the EITBIG construct, which is about technology implementation, and the

dependent construct of BMIOS. The BMIOS is about innovations that take place in the business models (i.e., different aspects of the business operations and activities) for online sellers.

The results reported in Table 6.1 show that the relationship between EITBIG–>BMIOS is significantly positive with a standardized regression weight of 0.331. Thus, for each unit invested in EITBIG, there is 0.331 unit of improvement in BMIOS. The relationship suggests that the better the firm is in EITBIG, the more likely it is that it successfully innovates its business model to accommodate the requirements of the new implemented technology tools of online selling. As its implication suggests, firms that are open for new ideas allow sharing of relative information among employees and experts, support helpful changes, accept risk with controlled uncertainty, and use efficient tools for project management. They are then in a better position to successfully reconfigure their way of doing business to select opportunities that can utilize the use of adopted online selling tools.

6.1.7 Effect of Control Variables

There are three different independent variables that were expected to affect the research findings for online sellers: 1) level of online selling, 2) past experience of online buying and 3) size of the firms, as presented in Section 4.5.4. Specifically, these independent variables were anticipated to exert a direct influence on the dependent construct of BMIOS, as control variables.

First, it was expected that different firms with different levels of online selling adoption rates might affect BMIOS. However, it was empirically evident that the impact of different levels of online selling adoption rates is not statistically significant ($p = 0.118$) on the BMIOS, as presented in Section 5.8 and Table 6.1. As an implication of this contrary finding, it seems that the BMIOS is largely and

significantly affected (i.e., predicted/explained) by the EITBIG (i.e., a net-enablement construct) as presented in Table 6.1, rather than being affected by the control variable for the level of online selling.

From the perceived impact of past experience of online buying perspective, the effect of this variable was introduced in Section 4.5.4. It was expected that prior experience in online buying might affect the extent to which online sellers innovate their business models to accommodate the new requirements needed by online selling tools implementation (BMIOS). It is evidenced that the prior experience of online buying has a significant effect of (-0.13) on the BMIOS construct as presented in Table 6.1. This means that for each unit increase in the level of past experience of online buying there is a (0.13) unit decrease in the BMIOS. While this is significant, still it has a weaker impact in comparison to the impact of the EITBIG construct of (0.331). This means that the EITBIG is a much better predictor for the BMIOS than the control variable of prior experience in online buying.

One possible explanation for this negative relationship could be derived from the literature that differentiates between buying and selling processes. The literature discussed in Section 2.3 suggests that online buyers are different in many perspectives from online sellers; online buyers are more proactive than sellers. The driving forces among firms to sell or buy online are different; and the product/service characteristics are simply different when it comes to the decision of what to buy and what to sell (e.g., Rask & Kargh, 2004; Neslin et al., 2006; Kioses et al., 2006; Loane et al., 2007).

Furthermore, Carr (2003) argued that dealing with and adopting technologies are not always helpful experiences. Already-implemented technologies could be a source of rigidity, limitation, and possible future threats for the firms. Following the same analogy, prior online buying experience might create

a psychological barrier that limits the thinking of decision makers about what they could sell online to those items that are typically available in the online market. However, possessing no prior experience in online buying could be an advantage for other decision-makers to think freely and innovatively without limitations about the typical examples of what is already sold online.

Another possible explanation is that firms may have decided not to sell online based on their previous experiences with online purchasing. That is, these firms may be aware of the limitations of purchasing some un-standardized products/services online, and understand that it is more practical to sell products that are standardized and easy to ship online. Thus, if their products/services are not consistent with these characteristics, they tend to avoid selling online.

The third expected variable to affect the BMIOS construct is the size of the firms. It was articulated that the BMIOS might be affected by collecting data from different firms with different sizes as they would have different levels of resources and expertise. The results reported in Section 5.8 show that different sizes of firms had no significant effect on the extent to which online sellers innovate their business models of online selling (BMIOS). This finding could be viewed that regardless of the level of resources and expertise associated with different sizes of firms, all online sellers innovate their business models to utilize the opportunities expected from adopted online selling tools.

Conjointly, the presented three variables are found to have either an insignificant or weaker direct effect on BMIOS, compared with the effect of net-enablement capability presented by the EITBIG construct. That is, the degree of business model innovation for online sellers is strongly and largely influenced by the internal organizational capability of net-enablement.

6.1.8 Summary

Many researchers called for further investigation of the challenging nature of online selling that caused many firms to be cautious about such technology adoption (e.g., Stockdale & Standing, 2002; Zank & Vokurka, 2003; Loane et al., 2007; Fischer & Reuber, 2011). A few others were involved in studying firms within sectors characterized as possessing below-average adoption rates yet innovatively using the online market to sell their products and services (e.g., Stennes et al., 2006; Jackson, 2010). Both groups of researchers called for uncovering the reasons that limit firms from selling online. One of the major findings reported in the literature is that the products/services of firms in sectors with below-average rates of online selling adoption are indeed not suitable for the online market (Bakker, 2000; OECD, 2001).

Theoretically, both dynamic capability and absorptive capacity theories are well established, influencing, and widely used theories. However, dynamic capability theory was criticized as tautological and difficult to identify (Lawson & Samson, 2001; Wang & Ahmed, 2007). Further, absorptive capacity was criticized for not addressing firm culture in addition to prior knowledge (Bosch et al., 1999). In 2002 a theory developed by Wheeler (2002) called Net-Enabled Business Innovation Cycle (NEBIC), associated internal organizational capability of net-enablement capability with the creation of customer value. However, very few attempts were made to operationalize parts of the NEBIC model (e.g., Williams, 2004). The model is still in its development stage and lacks operationalization, scale development, and validation. Researchers acknowledge the face validity of the NEBIC model and have called for further development (e.g., Zahra & George, 2002a; Williams, 2004; Bendoly, 2007; Soto-Acosta & Merono-Cerdan, 2008; Patrakosol & Lee, 2009; Yoo et al, 2010).

In response, this research developed a model based on the NEBIC theoretical framework, including both dynamic capability and absorptive capacity theories to utilize the powerful explanation ability of these theories while overcoming some of their shortcomings. The main objectives of this research thus were:

1. Understand the relationship between net-enablement capability of a firm and the innovation in business models for online selling,
2. Understand the net-enablement capability of the technology adoption process (i.e., identifying, selecting and implementing a technology), and
3. Operationalize concepts and develop scales for the research model and the adopted parts of dynamic capability, absorptive capacity, and NEBIC theories.

The validated research model presents a clear definition and measurement of items to operationalize concepts related to business model innovation for online selling (BMIOS). This study presented clear, precise, valid and reliable items that measure and operationalize net-enablement capability adopted from the NEBIC model. The relationship between net-enablement capability and BMIOS was precisely justified and rationalized. By this, the research model established the foundation based on the well-known theories of dynamic capability and absorptive capacity for future research in areas that related specifically to business model innovations, online selling adoption and the development of the NEBIC theory. This analysis can be further extended to the general literature of customer value creation and IT adoption.

It was evidenced that net-enablement capability, as an internal capability, is a valid and significant predictor of the dependent construct of business model innovation for online selling (BMIOS). Different independent control variables were tested. The status of prior online buying experience was

identified to be the only control variable that exerts a significant, yet weaker negative effect on the BMIOS compared with the effect of net-enablement capability on the BMIOS construct.

6.2 Implications for the Theory

This study sought to understand the association between internal organizational capability and innovation in business model that results from the implementation of online selling tools. Accordingly, this research has a number of implications for innovation in the business model and also the NEBIC, dynamic capability, and absorptive capacity theories.

This research is among the first to introduce, develop, and operationalize the concept of business model innovation. Specifically, the current research developed a construct to measure innovations in business models for online selling adopters (BMIOS). The developed construct is an extension to the NEBIC theoretical model, which lacks in addressing the innovation in business models needed after technology implementation. In addition, this study associates the development of net-enablement capability used to identify and implement a technology, as a prerequisite, with the innovation in business model for online sellers to assist in measuring, predicting, and understanding how online sellers transform their net-enablement capability of technology adoption into innovations in the business models.

As such, the development of the BMIOS construct and its relationship with net-enablement capability is intended to respond to the body of literature that argues that the adoption of any new technology necessitates undergoing innovations in the business models so as to utilize the opportunities of that new technology fully (e.g., Teece et al., 1997; Ciborra, 2009). Additionally, this research sensed some

signals in the literature that suggest a need for more investigation into the specific internal organizational capabilities that help firms adopt online selling tools (e.g., Bakos, 1997; Stockdale & Standing, 2002; Rask & Kragh, 2004). Further, there are several surprising and interesting examples collected from the online market, regarding the products/services that are not normally sold online (i.e., Table 6.2), which also motivate the development of the BMIOS construct.

Innovative Examples of Products/Services Sold Online
1- Animal semen based on genetic classification (dairy, beef, sexed)
2- Fresh flowers and plants as well as dried products and seeds (lavender, ginseng, dates, spices)
3- Natural oil, minerals, and some chemicals (as souvenirs and samples)
4- Wood cuts in natural or processed forms (as souvenirs)
5- Concrete and drilling products/services
6- Water softener salt and other salt-based products
7- Maple syrup-related products
8- Coffee products and machines
9- Professional consultation and service providers (e.g., legal services, academic consultation and admission services, technical programming and systems designers)
10- Health and social consultation services

Table 6.2: Examples of innovative products/services developed by online sellers.

From a NEBIC model perspective, this research responded to the calls to operationalize Wheeler's (2002) NEBIC theoretical model of net-enablement (e.g., Zahra & George, 2002a; Williams, 2004; Bendoly, 2007). The NEBIC model is an applied theory that describes the process of converting technology adoption into customer value creation. The current study contributes to Wheeler's (2002) theoretical model of net-enablement and enhances its related theories. This includes operationalizing concepts and developing measurable scales for the CET, MEO, and EITBIG constructs by

implementing a systematic and interactive model that emphasizes a firm's internal factors of net-enablement when adopting a technology for business growth as technology innovation.

Additionally, sharing information, communication with internal and external parties, and supportive culture for innovation are essential characteristics of the current research model to address aspects related to both dynamic capability and absorptive capacity theories and address the associated suggested development of the theories. From dynamic capability theory, the research model was informed by that theory by deploying and operationalizing concepts related to technology identification and information sharing that can lead to an innovative use of a firm's resources for the purpose of achieving business growth. From absorptive capacity theory, assessing organizational aspects, such as employee training and development; organizational learning and prior knowledge; effective communication among internal and external parties; and the creation of a business environment that appreciates new ideas were also incorporated into the research model.

6.3 Implications for the Literature

The current research bridges the gap in the literature related to investigating those sectors characterized as having below-average rates of adoption and uncovering the question of why some firms are very conservative in their decisions about selling online, as suggested by many researchers (e.g., Bakker, 2000; OECD, 2001; Stennes et al., 2006). Beside product/service characteristics and business external factors already addressed in the literature, the findings of this research show that development in internal net-enablement capability is the key issue that characterized successful online sellers compared with non-online sellers, regardless of the level of online selling adoption. Adopters who implemented online selling tools were found to possess better-developed net-enablement

capability compared to non-online sellers across different sectors and different rates of online selling adoption.

6.4 Implications for the Methodology

In this research, a rigorous hierarchical analysis (i.e., second-order factor) was conducted to better assess and address the multidimensional nature of the research constructs. The second-order version of the model showed better discriminate validity, convergent validity, and better overall GOF when compared with the first-order version of the model. This research thus responds to the literature that asserts that many behavioral and business studies suffer from not addressing the dimensions of each construct of the studied models (e.g., Edwards, 2001; Koufteros et al., 2009). They found that the many studies address their multidimensional constructs as a uni-dimensional construct (i.e., first-order factor analysis) and concluded that this practice reduces the model GOF as well as increases the risk of not showing discriminate and convergent validities.

6.5 Implication for Practitioners

From the practitioner perspective, this research provides useful guidelines and helpful examples to stimulate and support firm growth and assist both practitioners that have not implemented online selling and those that failed in such implementation. These guidelines and examples should be developed further and implemented within firms that intend to adopt online selling. Decision- makers, especially non-online sellers, are encouraged to share the findings of this research so as to assess their readiness for selling online. They are invited to look again at the possible opportunities for selling online with an open mind and clean lens, as their counterpart online sellers did. The research findings suggest that online sellers underwent innovations in many parts of their business models in order to

utilize the implementation of online selling. They were also evidenced to be better in developing their net-enablement capability (CET, MEO, and EITBIG) so as to successfully implement online selling tools compared with non-online sellers.

Adopting online selling is evidenced to be associated with reconfigurations and changes in many parts of firms so as to accommodate the new requirements of adoption of online selling. Examples of the changes that happened in the business models of online selling adopters include, but are not limited to, technologies within the firm, payment methods, order placement procedures, geographical reach, products/services, and sales channels. Online sellers cultivated products/services to be sold online even if these ventures did not usually lend themselves to an online context. There are many examples of the innovations that some firms undertook to sell their products online as listed in Table 6.2.

Innovation in the business model for online selling was evidenced to be influenced by net-enablement capability used to implement online selling. In order to be better candidates for selling online, decision- makers should develop their firms' capability in net-enablement. This capability includes three constructs, namely, choosing enabling technologies (CET), matching proposed technologies with economic opportunities (MEO) and executing information technology as business innovation for growth (EITBIG)

Decision- makers are encouraged to implement efficient procedures to use to scour the market for new technologies (represented in the research on the CET construct). This search can be accomplished through internal and external parties. In some cases, a pilot test of the proposed technology should take place for better assessment purposes. Other competitors’ experiences with

different/similar technologies could also be gathered for future use. Consultation from insiders and outsiders can help select the most-promising technology to adopt.

Then, decision-makers should evaluate their strategic options for growth and find how the proposed technology will help achieve the desired business growth (represented as MEO construct)—for example, seeking IT solutions that create additional opportunities while solving existing problems. Further, decision-makers should seek help from employees, customers, and vendors and their opinions related to the new technology and its suitability for possible implementation. Effective communication with clear information sharing is an important factor for effective technology preparation for possible adoption. This process is accomplished by sharing clear objectives of the proposed technology and gathering feedback from all related parties about the fit of the new technology within the current business environment and also suggestions for possible reconfiguration and changes needed for possible positive adoption. Information about new technology adoption also needs to be exchanged among employees in an easily understood language. Also, decision-makers should collect technical information from the market about the proposed technology and organize that collected information in a meaningful related way.

The last construct in the capability of net-enablement for technology identification, selection, and implementation is executing the proposed technology as business innovation for growth (EITBIG), done by managing project implementation, creating a business culture that supports and appreciates new ideas, and providing needed training for targeted employees.

From a project management perspective, firms need to assess their ability to complete projects on time and within budget. They should also assess the level of development and satisfaction within the

firm as an impact of the implemented technology and whether that technology is actually used in the way it was intended and by the people it targeted. Creating a business culture that supports idea generation can exert a significant positive impact on technology execution process. Online sellers were found to appreciate innovative ideas and allow for helpful changes. The impact of this appreciation was associated with being quicker in responding to changing market conditions compared to non-online sellers. The last dimension within the execution process is to appreciate employee training and on-job development, including sharing information and discussing the different opinions of employees regarding the technology adoption process. Consequently, surprises in dealing with the technology after full implementation are expected to be minimal, since every employee related to the implemented technology is involved in the adoption process.

All the previous processes and perspectives were found to be better developed among those who decided to sell online. It is important to notice that these recommendations for net-enablement development and the associated innovation in business model for online sellers are not developed or acquired in a one-step solution. They are developed gradually and over time. Further, they require continuous investments in both manpower and technologies.

6.6 Recommendations for Future Research

The logical extension for this research is to operationalize the last construct of NEBIC, which is assessing customer value (CV) created by the technology adopted (i.e., online selling) to help complete the NEBIC theoretical cycle. Completing the theory's cycle helps firms understand the advantages and shortcomings of a firm’s recent technology adoption from a customer perspective and retains this feedback for the future cycle of technology selection. Such feedback can have two main

advantages. First, it offers diagnostic and controlling tools to help enhance future technology selection. Second, it will help the ongoing process of developing the net-enablement capability of firms which can be further evaluated using longitudinal study. This construct was not included in the current research as it needs to collect data directly from customers. Collecting such data was not attainable due to limitation in time and resources.

Another recommended future effort is to apply this research model in other developing and developed countries to compare the findings with these current findings that represent the Canadian context only. This effort will help also in assessing the generalizability of the current model when reused in different countries.

This research confirmed the importance of internal net-enablement capability for adopting online selling. In addition to the effect of the external business environment, the characteristics of products/services, and this research and its results related to the effect of internal organizational capability, researchers are encouraged to investigate other factors that are preventing/encouraging firms to sell online. Also, it would be beneficial to investigate the specific competitive advantages that online sellers in sectors with below-average rates of adoption that are gained from implementing online selling tools. This investigation would produce better outcomes if conducted through a qualitative research process that allows in-depth exploration to gather broader and context sensitive information.

Other researchers can benefit from this study by deploying its scales to replicate the model in the same setting to check for validation and reliability. Also, this research model can be applied to different settings that relate to net-enablement capability, seeking a possible generalizability of the

model beyond the basic use of digital networking. For example, social networking websites (i.e., Twitter and Facebook) could be examined for further assessment. Firms are already joining these social networking websites; thus, further research is required and valuable to assess the net-enablement impact of those websites on online selling or other technology, products, or service proposals for implementation. Recent events in Middle East countries as a possible consequence of use of those social networking websites are really inspiring.

In this research, the construct of BMIOS was found to be reliable, valid, and reasonably possess one dimension using many statistical tools. However, the EFA-PA approach suggests that the BMIOS actually has two dimensions. Thus, researchers are encouraged to further develop the scale and test it in other contexts, for example, a larger sample, or by using different statistical tools to investigate the complete dimensionality of the construct.

One of the limitations of this research is the CMV bias associated with a single key informant. Thus, replicating this research with multiple informants would be a recommended extension of the research. Different informants should be selected to answer the dependent and independent constructs of the model. However, the use of multiple informants should be cautionary as well, since doing so may lower the response rate and lead to insufficient cases collected to examine. New empirical ideas and practices to increase the response rate in such cases would be a great contribution. Presumably, case studies and laboratory experiments (or a combination thereof) would be better methodologies compared to a basic survey instrument. Additionally, shorter and more-focused surveys could be used as an adjunct technique.

6.7 Limitations

Some limitations do apply to this research. First, this research does not claim generalization, as it is limited to Canadian firms from the private sectors that were covered. Presumably, this study represents only those firms that participated in the survey. Thus, the scope of the research is limited in its generalizability for other public sectors, countries, and other Canadian firms and sectors not covered in the research.

Second, this research exhibited a very low response rate, and yet that response was sufficient to conduct the required analysis. This issue is common in similar research, and there was no statistical evidence in this research that showed that the resulting low response rate was actually associated with a significant non-response bias. However, the research findings are very conservative when associated with generalization and represent those who participated in the study better than any others. Additional factors may explain more of the variance in BMIOS than that captured in the current model.

Third, a key informant was the data source for this research and consequently formed the basis for the research results. The typical criticism that would arise from using a key informant as the main source of this research is the possible CMV. That is, using a single informant to gather data for both dependent and independent constructs is a source of bias. This issue was tested statistically and found to be insignificant. This finding does not eliminate the fact that the study might be somehow biased, however.

Fourth, while the net-enablement constructs were developed, validated, and confirmed both theoretically and empirically, the items of net-enablement capability presented in this research may be

somewhat simplistic. The items measured may be characterized as broad or general and addressed to only a key informant within each targeted firm. The actual nature of firm and business owner strategies and driving forces are much more complex than can be captured by these survey items. Fifth, although EITBIG and BMIOS constructs have significant theoretical relationships and acceptable empirical evidence, the EITBIG construct is not a very strong predictor of the business model innovation construct (BMIOS), as the path coefficient produced by this study is considered relatively low, while yet significant.

Finally, this research operationalized and validated all but one construct of the NEBIC constructs. Consequently, researchers should be cautious when using the current research results as these results did not address the feed-back information about customer value in assessing a firm's performance. In the original NEBIC model, assessing customer value has an important role in assessing a firm's performance after IT adoption that would help in enhancing future IT identification, selection, and implementation process.

6.8 Conclusion

This research is well positioned as a precise response to the call for investigation of online selling phenomena (e.g., OECD, 2001; Loane et al., 2004; Stennes et al., 2006; Fischer & Reuber, 2011) and focused to try understand the surprising observations from sectors with below-average rates of online selling adoption. Although these sectors are characterized as challenging for online selling adoption (i.e., there is no push from the external environment toward adoption), some firms were able innovatively to sell products/services that are not normally sold online. The literature associated a better level of online selling adoption with both the existence of an unchallenging business

environment as an external factor that encourages adoption and the characteristics of products/services that are easily sold in the online context. However, the literature lacks in addressing certain internal organizational factors that can explain the adoption of online selling across all sectors (e.g., Stockdale & Standing, 2002; Rask & Kragh, 2004).

The research is thus aimed to understand the impact of net-enablement capability, as an internal rather than external factor, regarding the decision to implement online selling tools as technology innovation to achieve growth. This study created, developed, and validated a construct to capture and assess what firms actually did innovate in their business models after implementing online selling tools (BMIOS). This construct was further associated with the net-enablement capability, as an extension to the NEBIC model, so as to assess and understand the impact of this capability on BMIOS. Then, all the net-enablement capability constructs of choosing enabling technology (CET), matching economic opportunities (MEO), and executing information technology as business innovation for growth (EITBIG) were developed, validated, and confirmed. Further, all the underlying dimensions and hypotheses were tested and found to be relevant and supported.

Consequently, this study contributes to the literature arguing that the adoption of a new technology necessitates undergoing innovations in business models for the purpose of utilizing new technology benefits (e.g., Teece et al., 1997; Ciborra, 2009). Further, the outcomes of this research contributed to the literature by using and improving the dynamic capability and absorptive capacity theories as well as developing, operationalizing, deploying and extending Wheeler's (2002) theory of net-enablement as recommended by many researchers (e.g., Teece et al., 1997; Bosch et al., 1999; Wheeler, 2002; Zahra & George, 2002a; Williams, 2004; Zahra et al., 2006).

Appendix 1
Identified Scales and Routines

A) Choosing Enabling Technology (CET)

This Appendix contains all the detailed routines/steps extracted from the literature for each dimension of the choosing construct.

List of the dimensions:

1. Identifying
2. Assessing
3. Filtering
4. Reaching conclusion (RC)

Note: Items can be duplicated, yet from different author.

1.1 Question-like items

Adapted from Wheeler (2005), questions proposed to identify organizational detailed-routines that builds-up organizational net-enablement "choosing construct" toward creating customer value. Researchers are advised to keep these questions in mind while searching the literature for detailed-routines.

- How are enabling technologies identified?
- Who has formal responsibility for enabling technologies selection? Time?
- What mechanisms are used for filtering and deciding?
- How are executives and line managers apprised of enabling technologies?

Adapted from Williams (2004), interview questions designed to identify the choosing capability's detailed-routines in the general context of information technology. (Williams, 2004, pp.325-326). Researchers are advised to keep these questions in mind while searching the literature for detailed-routines.

CET – Background

- On a scale from 1-10, what value does your firm place on emerging technologies?
- On a scale from 1-10, how would you rate the attitude of your organization towards technological change?

- On a scale from 1-10, how does your firm compare with your competitors evaluating and implementing new technologies in a timely fashion?

CET – Identify

- What are several recent technologies your organization has examined?
- How did you first learn about said technologies?
- Do you have a routine process for identifying emerging technologies? If so, what is it? If not, can you describe a typical scenario for identifying emerging technologies?
- What are the budgetary realities you face in experimenting with new technologies?
- Who is responsible for monitoring emerging technologies within your organization?
- How do you or your IT function stay current with technological trends?

CET – Assess

- What evaluation procedures do you typically implement for evaluating new technologies?
- What is the relationship between IS professionals and business professional involved in evaluating new technologies?

CET – Filter

- What are the technology standards that guide your evaluation of emerging technologies?
- What role do the business leaders in your organization play in evaluating emerging technologies?
- How frequently does your organization practice trial on adoption on new technologies?

CET – RC

- What role does your IT strategy play in your evaluation of emerging technologies?
- What guidelines do you use for determining when to begin and how to evaluate emerging technologies?

Adapted from Williams (2004, p.327) measuring firms' perception of CET capability (Questionnaire Items). Perception of CET from 1 (low) to 5 (high).

On a scale of 1-5, please answer the following questions:

1- How would rate the quality of IT choices by your organization?

2- How consistently does your organization make IT choices at the quality level indicated above?

3- How does your firm compare with industry peers at evaluating and implementing new technologies in a timely fashion?

4- How consistently does your organization make IT choices at the timeliness level indicated above?

1.2 Detailed-routines

Adapted from Williams (2004), detailed-routines for CET (in general IT context):

A. Identifying detailed-routines:
   - Building user relationships
   - Formal responsibility for monitoring enabling technology
   - Exposure to institutional discourse
   - Partnering with vendors

B. Assessing detailed-routines:
   - Personal technology playfulness
   - Limited experimentation
   - Comparative evaluation during lifecycle
   - Assessing near peers' enabling technology
   - Participation in institutional interpretation

C. Filtering detailed-routines:
   - Stakeholder pressuring
   - Seeking user input
   - Cost
   - Extended trial
   - Requirement specificity

D. RC detailed-routines:
   - Re-evaluation

- Stakeholder influence
- Formal approval process
- Partnering with vendors
- Vendor evaluation
- Regulative / normative compliance

B) Matching Economic Opportunities (MEO)

This Appendix contains two sections. The first section contains all scales extracted from the literature for the matching construct that measures each of the construct dimensions. The second section contains detailed routines/steps extracted from the literature, especially for those dimensions with no matching scales.

List of the dimensions within this construct:
1. Selecting economic opportunities (SEO)
2. Continual dialogue and sensemaking (CDS)

Note: Items can be duplicated, yet from different author.

1.1 Scales

Continual dialogue and sensemaking (CDS):

Adapted from Menon et al. (1999), communication quality (strongly agree / strongly disagree) (p.37). The extent of having continues interaction and communication among staff members

- The key players involved had continues interaction during implementation of the strategy.
- The strategy's objectives and goals were communicated clearly to involved and concerned parties.
- Team members openly communicated while implementing this strategy.
- There were extensive formal and informal communications during implementation.

Adapted from Akgun et al. (2006), Measuring sensemaking (on a scale from 1 to 10 where 0=strongly disagree and 10=strongly agree) (pp.215-216, 222).

- Information collected by the team (for example, test results) was coded and sorted to be understood easily by other team members.
- Market information was organized in meaningful ways.
- Technical information was organized in meaningful ways.

1.2 Detailed-routines

Selecting economic opportunities (SEO):

Adapted from Christensen et al in Hills (1994), factors affecting opportunity identification from entrepreneurial perspective (pp.67-72):

1. environmental changes
2. technological and market knowledge
3. firm's learning
4. the ability to use external resources
5. the ability to turn problems into opportunities
6. the ability to think strategically
7. strategic planning helps in evaluating opportunities, setting priorities, and implementation of new opportunities

Adapted from Corbett (2002), recognizing business opportunities in high technology environment. Business opportunities recognition is affected by (p.50):

1. Learning mode
2. Cognitive style
3. General human capital
4. Specific human capital

Factors in opportunities recognition (p.139):

1. The importance of existing specific expertise and technical skills
2. Preferred information processing style

Adapted from Singh (1998), sources of opportunities (pp.25-27):

1. Technologies
2. Change in Consumers economics
3. Social values
4. Political actions, as well as changes in regulations and standards

Adapted from Wheeler (2005), questions proposed to identify organizational detailed-routines that builds-up organizational net-enablement matching capability toward creating customer value. Researchers are advised to keep these questions in mind while searching the literature for detailed-routines.

- What mechanisms are used for matching?
- How are priorities set for now, soon, and later?
- How are strategic options setup and executed?
- Which productivity levers does this business case target?
- Why now? Is this the right investment to achieve a result or are there antecedents?
- What changes in business processes are required to realize the benefits of this IT?

C) Executing IT as Business Innovation for Growth (EITBIG)

This Appendix contains all scales extracted from the literature for the executing construct that measures each of the construct dimensions.

List of the dimensions within this construct:
1. Project Management (PM).
2. Employee education (EE).
3. Creation of a supportive culture (CSC).

Note: Items can be duplicated, yet from different author.

Adapted from Cook (2004), Measuring project management success. On a scale from 1 to 5 where 1=strongly disagree and 5=strongly agree) (pp.120-128).

A- Overview of the project management performance:

- The most recent project was completed on schedule.
- The project was completed within budget.
- The end product (or service) that was developed under this project works.
- Use of the final product (or service) lead directly to improved decision making for the end user.
- The final product (or service) had a positive impact on those who use it.
- You were satisfied with the process by which the project was being completed.
- Given a set of alternatives, this project (or service) that was developed was the best solution for the problem on hand.
- The results of this final product (or service) represent a positive improvement on those who use it.
- The final product (or service), is used by its intended users.
- Given the situation as whole, with all things considered, the project was a success.

B- Project management presence.

1- Managerial support:

- Administrative staff worked in concert with team members to update the project's schedule as necessary.
- Administrative staff met regularly with project team members to inquire whether administrative tasks were made during the reporting period.
- Administrative staff met regularly with project team members to gather time sheet report that itemize the administrative tasks were undertaken.
- Administrative staff met regularly with project team members to update the project's workbook during the reporting period.
- Administrative staff assistance was provided to help document the results in a standard format as the project was carried out.

2- Human resources:

- Assistance was received in identifying the appropriate person to manage the project.
- The project manager received assistance in identifying the proper skills that are required for the project.
- The project manager received assistance in identifying skills gaps between what was needed and what was required, in existing staff, in order to determine what skills were needed in order to successfully complete the project.
- The project manager demonstrated a level of balance, i.e., adequate technical, interpersonal, administrative skills, etc. in order to complete the project.
- Human resources received adequate assistance on the necessary changes in human resource policies and procedures.

2- Consulting and mentoring:

- The organization provided assistance in developing a plan.

- The organization provided assistance in ensuring project management methodologies were utilized.
- The organization encouraged project startup practices, this included development of a charter, scope management, and a kickoff meeting.
- The organization identified sources of information that enable team members to resolve unexpected problems in a timely manner.
- The project manager received adequate mentoring on necessary measures to successfully manage complex projects.

Employee education:

Adapted from Cook (2004), Measuring employee training. On a scale from 1 to 5 where 1=strongly disagree and 5=strongly agree) (p.127).

- Project team members received assistance in identifying and documenting existing skills.
- Project team members received introductory training materials on project management.
- Project team members received training on advanced project management techniques.
- Project team members received assistance in determining strategic train needs for future projects.
- Project team members received support in an effort to attend training courses for strategic (future) needs.

Creation of a supportive culture

Adapted from Menon et al. (1999), innovative organizational culture (strongly agree / strongly disagree)(p.36). The extent of having an emphasis on inventiveness in the organization.

- People in this division stress quick response to changing market conditions.
- Our division's management style encourages a high level of participation.
- Our division is dynamic and entrepreneurial.
- Information is credibly and openly shared.
- Our division emphasizes innovation and change.
- There is a general felling of trust and confidence between different groups.

- People feel that their ideas and information are listened to by others.

Adapted from Cameron and Quinn (1999), identifying culture types - scale to identify the adhocracy culture that support creativity (on a scale from 1 to 5 where 1=strongly disagree and 5=strongly agree) (pp.154-166).

- I encourage others in my unit to generate new ideas and methods.
- I generate, or help others obtain, the resources necessary to implement their innovative ideas.
- When someone comes up with a new idea, I help sponsor them to follow through on it
- I articulate a clear vision of what can be accomplished in the future.
- I regularly come up with new, creative ideas regarding process, products, or procedures for my organization.
- I constantly restate and reinforce mu vision of the future to members of my unit.
- I help others visualizing a new kind of future that includes possibilities as well as probabilities.
- I am always working to improve the processes we use to achieve our desired output.
- I facilitate a climate of continues improvement in my unit.
- I have developed a clear strategy for helping my unit successfully accomplish my vision of the future.
- I capture the imagination and emotional commitment of others when I talk about my vision of the future.
- I create an environment where experimentation and creativity are rewarded and recognized.
- I encourage everyone in my unit to constantly improve and update everything they do.
- I encourage all employees to make small improvements continuously in the way they do their jobs.
- I help my employees strive for improvement in all aspects of their lives, not just in job-related activities.

D) Business Model Innovation for Online Selling (BMIOS)

This Appendix contains detailed-routines for "Business Model Innovations" extracted from the literature.

A- Business model functions

(Chesbrough & Rosenbloom, 2002, pp.533-534)

- Articulate the value proposition, i.e. the value created for users by the offering, based on the technology.
- Indentify a market segment, i.e. the users to whom the technology is useful and for what purpose, and specify the revenue generation mechanism(s) for the firm.
- Define the structure of the value chain within the firm required to create and distribute the offering, and determine the complementary assets needed to support the firm's position in this chain.
- Estimate the cost structure and profit potential of producing the offering, given the value proposition and value chain structure chosen.
- Describe the position of the firm within the value network linking suppliers and customers, including identification of potential complementors and competitors.
- Formulate the competitive strategy by which the innovating firm will gain and hold advantage over rivals.

B- Business model innovation meaning

(Chesbrough, 2003, p.89)

- Change in the current business model when the current business model is not working effectively or to accommodate new business requirements.
- Motivate the run of the risks involved in developing the new business model.

C- Business model innovation success factors

(Chesbrough, 2007, pp.16-17)

- Business model innovation needs involvements of top leadership and other department heads.
- Providing resources and authority to managers to define and lunch the new business model.

- Separating the funding of the new business model from the current business operations funds. This is to avoid conflict of interest with the current rewarding business model.
- Expanding the new business model. A competition with the existing business model expected to happen. The one believed more promising will win the competition.

D- Online selling aspects:

Questions related to the stage of online selling processes achieved, website ownership, pricing method, and payment type ...etc. were included.

Appendix 2

Exploratory Stage Survey Items (For Experts)

As part of my Ph.D. research, I am developing a questionnaire to measure the capabilities that help firms change their business models through adoption of e-business. At this stage, I have a number of potential measurement items and ***seek the help of other researchers and managers in firms that use e-business to help me choose which items to use and to improve wording***. In the next stage of my research, I will send the resulting questionnaire to a national sample of firms to see if these capabilities can distinguish between firms that sell online, and those that do not.

This document contains five sections. At the beginning of each section, I describe the types of information/capabilities that the items in that section are intended to measure. ***For each item, please use the scale to indicate how well you think each item measures the capability. I would also appreciate your qualitative comments about any items, especially suggestions to improve their clarity, and ideas for additional items.*** The information you provide will help me to reduce the number of items included in my final questionnaire, and make sure that the items I do use are valid and reliable.

If you have any questions regarding this study, or would like additional information to assist you in reaching a decision about participation, please contact either me at (519) 589-0551, afbasiou@engmail.uwaterloo.ca, or my supervisor, Prof. Rod McNaughton at (519) 888-4567 ext. 32713, rmcnaughton@uwaterloo.ca. Further, if you would like to receive a copy of the results of this study, please contact either investigator.

This study has been reviewed and received ethics clearance through the Office of Research Ethics at the University of Waterloo. It is absolutely up to you to participate in this study. If you have any comments or concerns resulting from your participation in this study, please feel free to contact Dr. Susan Sykes, Director, Office of Research Ethics, at 1-519-888-4567, ext. 36005 or by email at ssykes@uwaterloo.ca

Thank you for your time,

Abdullah Basiouni
University of Waterloo, Management Sciences
afbasiou@engmail.uwaterloo.ca
(519) 589-0551

Part 1: Demographic Questions

This section intends to collect general demographic information about all targeted companies. Please note any changes in wording that will improve the item.

Note: You are not requested to answer the questions, rather you are kindly requested to suggest changes to the wording if you think an item is not clearly worded.

1. What is your position in the company?

_____

2. Approximately how many employees does your company have?

☐ Less than 10 ☐ 11 - 50 ☐ 51 – 100 ☐ 101 – 250
☐ 251 - 500 ☐ 501 - 1000 ☐ Over 1000

3. Approximately what were your total sales last year?

☐ $1 - $99,999 ☐ $100,000 - $199,999
☐ $200,000 – $499,999 ☐ $500,000 - $999,999
☐ $1,000,000 – $4,999,999 ☐ $5,000,000 - $9,999,999
☐ $10,000,000 – 24,999,999 ☐ $25,000,000 - $49,999,999
☐ $50,000,000 +

4. Does your firm purchase online any of the materials, components or services that are used to manufacture a product or deliver a service?

☐ Yes ☐ No

If yes, what are the categories of your purchases (select all that apply)?

☐ Office supplies ☐ Raw materials ☐ Component parts
☐ Others, please specify: _____

How do you purchase online (select all that apply)?

☐ Online retailer ☐ Via online auction ☐ Electronic Data Interchange
☐ Others, please specify: _____

If no, why doesn't your firm purchase online?

_____

Can you suggest any additional demographic questions?

1. _____
2. _____
3. _____
4. _____

Part 2: Personal and Demographic Information for Online Sellers (Business Owners/Managers):

Online selling could be defined as the placement of product/service orders and the establishment of the purchasing commitment (i.e., via e-mail, Web site, EDI, extranet, etc.) using the Internet, whether the payment is made online or offline (i.e., via Internet, telephone, facsimile, cash, cheque, etc.), or whether the sales conducted via the firm's or others' Web site.

This section intends to collect demographic information about online sellers. Please note any changes in wording that will improve the following items.

Note: You are not requested to answer the below questions of this part, rather you are kindly requested to change the wording if you think an item is not properly written.

Do you sell online?
☐ Yes ☐ No

If no, please briefly describe why not:
1. _____
2. _____
3. _____
4. _____

If yes, please answer the following questions:

1- In what year did your company start to sell online? _____
2- Approximately, what is the percentage of your online sales from your total annual sales? _____
3- Do you think your gross sales have grown as a result of online sales?
☐ Yes ☐ No
4- Have you been involved in any capacity in adopting the online selling in your firm?
☐ Yes ☐ No
5- How do you receive your online orders (select all that apply)?
☐ Your own Website*
☐ Other's Website (eBay, online mall, client's Website)*
☐ E-mail
☐ Intermediary (agent)
☐ Online auction
☐ Industry portal
☐ Electronic Data Interchange (EDI)
☐ Other (please specify): _____

If * selected, what are the items included in your or your client/agent Website (select all that apply).
☐ Brief introduction and background about the company
☐ List of products/service
☐ List of prices
☐ Contact information
☐ Email

☐ Online payment
☐ Feedback from customers (reviews)
☐ After sale services/follow-up

6- Who maintains your online sales?
☐ The company itself ☐ Outsourced
7- Who is your targeted customer?
☐ Individuals ☐ Other businesses ☐ Both
8- Which type of payment do you accept for your online sales?
☐ Online payment
☐ Offline payment (via telephone, facsimile, cash, cheque, etc.)
☐ Both
9- What type of pricing does your company use in the online products/services?
☐ Fixed
☐ Dynamic
☐ Both

10- What are the factors that you think were important before and during your implementation of the online sales?

_____

11- Do you think these factors already existed in your company or you developed these factors specifically to sell online?

_____

12- What changes have been made in your way of doing business in order to establish and use the online sales option?

_____

Can you suggest any additional demographic questions for online sellers?
1. _____
2. _____
3. _____
4. _____

Part 3: Items to Measure Choosing IT Capability

Information technology (IT) choosing capability is the ability to select one or more information technologies (such as online selling) for possible implementation. The *choosing capability* consists of three main processes: (1) ***identifying***; (2) ***assessing***; (3) ***filtering and reaching a conclusion*** about selecting IT.

Note: Please **indicate the extent** to which you think each item measures an important element in the process of ***identifying*** new IT opportunities (e.g., identifying online selling as a possible opportunity) by putting an (X) corresponding to the scale where 1 = not important at all and 7 = very important. Also, kindly note any changes in wording that will improve the following items.

Measurement items	Not important at all						Very important
	1	2	3	4	5	6	7
A method to collect information from internal stakeholders (e.g., employees and managers) about IT related needs and trends.							
A method to collect information from external stakeholders (e.g., clients and customers) about IT related needs and trends.							
A person (department or unit) who is responsible for monitoring information about new IT related opportunities.							
Managers and employees that keep abreast of IT related developments and trends (e.g., by attending conferences, reading trade journals, etc.)							
Interaction with vendors of IT solutions to keep abreast of new software, services, and related developments.							

Can you suggest any additional elements in the process of identifying new opportunities to use IT in a business?

1. _____
2. _____
3. _____
4. _____

Please <u>indicate the extent</u> to which you think each item measures an important element in the process of *assessing* new IT opportunities (e.g., assessing online selling for possible implementation) by putting an (X) corresponding to the scale where 1 = not important at all and 7 = very important. Also, kindly note any changes in wording that will improve the following items.

Measurement items	Not important at all						Very important
	1	2	3	4	5	6	7
Encourage IT users to examine how new technology can be applied to their job.							
Conduct pilot projects to determine impact of new IT on business operations.							
Gather competitive intelligence on the use of IT by competitors.							
Look for insights on implementation from other organizations that have already adopted the technology.							
Collect information from experts regarding the application of new IT.							

Can you suggest any additional elements in the process of assessing new opportunities to use IT in a business?

1. _____
2. _____
3. _____
4. _____

Please <u>indicate the extent</u> to which you think each item measures an important element in the process of *<u>filtering and reaching a conclusion</u>* about choosing a new IT for possible implementation (i.e., filtering and reaching a conclusion about choosing online selling for possible implementation) by putting an (X) corresponding to the scale where 1 = not important at all and 7 = very important. Also, kindly note any changes in wording that will improve the following items.

Measurement items	Not important at all						Very important
	1	2	3	4	5	6	7
Pressure from firm's stakeholders to select an IT over other technologies.							
Collect feedback from technology users (both external and internal).							
Construct financial models of acquiring and implementing a new IT.							
Ability to assess technical requirements of implementing a new IT.							
Data from pilot projects are used to compare alternatives.							
Establish objectives against which benefits of a new IT are compared.							
A formal process for approving a new IT.							
Check background of IT software/service providers (e.g., with respect to experience, reputation, etc.)							
Compliance with legislation or industry standards in selection of IT.							

Can you suggest any additional elements in the process of filtering and reaching a conclusion about the use of the proposed IT in a business?

1. _____
2. _____
3. _____
4. _____

Part 4: IT Matching Capability - Perceived Process for Selecting Economic Opportunities

IT ***matching capability*** is defined as the ability to match proposed technology benefits with the firm's potential economic opportunities. One of the ***choosing capability*** processes is the firm's process to ***select economic opportunities***.

Note: Please indicate the extent to which you think each item measures an important element in the process of ***selecting economic opportunities*** that could be achieved by the adoption of the new selected IT (e.g., online selling) by putting an (X) corresponding to the scale where 1 = not important at all and 7 = very important. Also, please note any changes in wording that will improve the following items.

Measurement items	Not important at all						Very important
	1	2	3	4	5	6	7
Actively seek opportunities created or facilitated by new IT							
Seek IT solutions that create opportunities while solving problems.							
Have a formal strategic plan that explicitly incorporates IT							
Typically evaluate multiple solutions when faced with a problem.							
Often look to IT for a solution when faced with problem or challenge in the organization.							
Internal IT users (or the clients' IT users if outsourced) have knowledge about or experience with the IT.							
Customers/clients have knowledge about or experience with the IT.							

Can you suggest any additional elements in the process of selecting economic opportunities that can be achieved by implementing the new IT in a business?

1. _____
2. _____
3. _____
4. _____

Part 5: Perceived Business Model Innovation for Online Selling

Business model innovation for online selling can be defined as the reconfiguration of firms' ways of doing business (i.e., products, services, procedures, etc.) for the purpose of implementing and using online sales. ***This section is intended for online sellers only.***

Please indicate the extent to which you think each item measures an important sign in the process of *reconfiguring* a firm's business model in order to successfully implement the online selling by putting an (X) corresponding to the scale where 1 = not important at all and 7 = very important. Also, please note any changes in wording that will improve the following items.

Measurement items	Not important at all						Very important
	1	2	3	4	5	6	7
Change in product design/package.							
Change in sales channels.							
Change in order placement procedures.							
Change in delivery channels.							
Change in customer's geographical reach.							
Change in payment methods.							
Change in firm's managerial control/responsibility.							
Change in technologies within the firm.							
Change in the level of risk involvement of the adoption.							
Change in sales.							

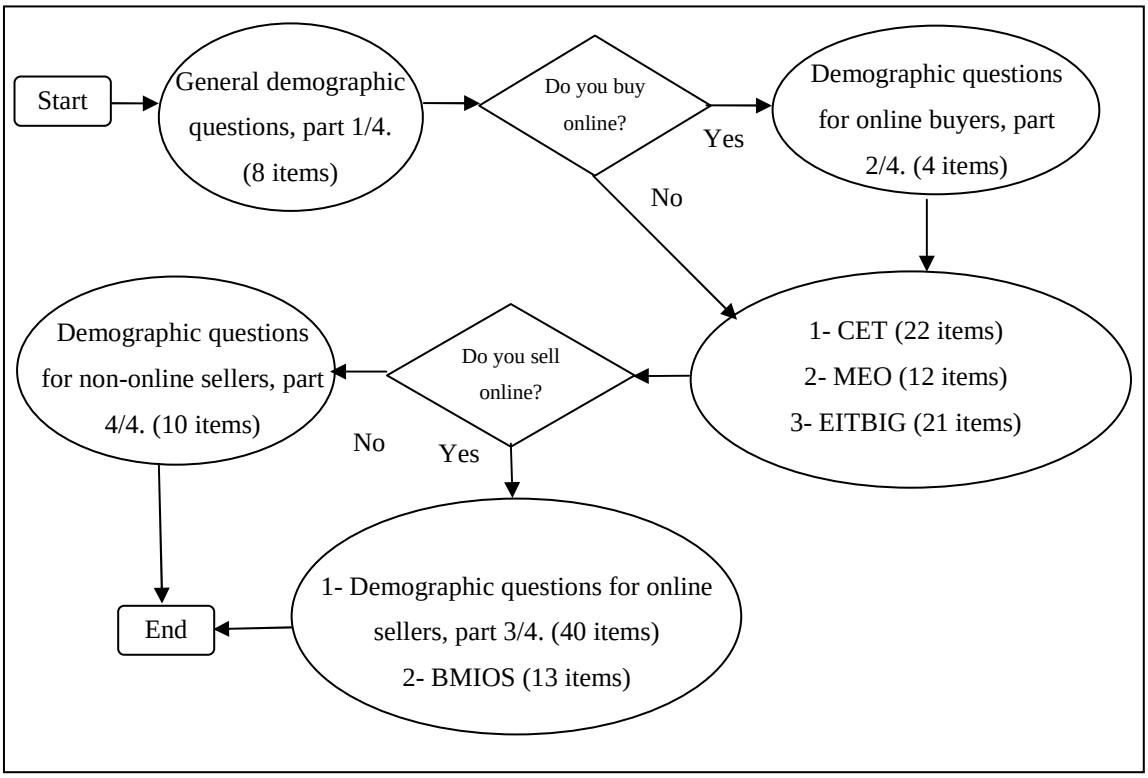
Can you suggest any additional elements in the process of reconfiguring current ways of doing business to adopt online selling?

1. _____
2. _____
3. _____
4. _____

Appendix 3

Exploratory Stage Survey Items (Final)

A) Scale Logic



Graphical representation of the logic of the current research's scale.

B) Email Invitation Letter

E-Business Model Innovations Study

Dear (Name),

My name is Abdullah Basiouni and I am a Ph.D. candidate from the Management Sciences Department at the University of Waterloo. I am developing a questionnaire to measure some of the capabilities associated with information technology adoption. Thus, I am seeking your help and contribution in my study to validate and confirm these measurements of the effect of firms' abilities to utilize their IT networks in the decision of IT adoption.

I would greatly appreciate your response to the questions found in the below link. Completing the questions and submitting the survey implies your consent to participate in this study. Please be assured that your responses will be held in the strictest confidence. Your response will be entered into a data file with no personal identifications.
Survey's link: http://www.survey.com

Should you have any questions about the study, please contact me at afbasiou@engmail.uwaterloo.ca or my supervisor Prof. Rod McNaughton (519) 888-4567 ext. 32713, rmcnaughton@uwaterloo.ca.

This project has been reviewed and received ethics clearance through the Office of Research Ethics at the University of Waterloo. If you have any comments or concerns resulting from your participation in this study, please feel free to contact Dr. Susan Sykes, Director, Office of Research Ethics, at 1-519-888-4567, ext. 36005 or by email at ssykes@uwaterloo.ca.

I would like to thank you in advance for your participation in this study.

Yours faithfully,

Abdullah Basiouni
University of Waterloo, Management Sciences
afbasiou@engmail.uwaterloo.ca
(519) 589-0551

C) Thank you Letter

Short thank-you email for all participants

Subject: E-Business Model Innovations Study – Thank You for Your Participation (thank you email)

Dear (Name),

I would like to thank you for your participation in this study. You have contributed to the study by providing your perception about the measurement items. Please remember that any data collected from you will be kept confidential. Once all the data are collected and analyzed for this study, all data collected will be destroyed and deleted. If you are interested in receiving more information regarding the results of this study, or if you have any questions or concerns, please contact me at either the phone number or email address listed at the bottom of the page.

I also want to assure you that this project was reviewed by, and received ethics clearance through, the Office of Research Ethics at the University of Waterloo. Should you have any comments or concerns resulting from your participation in this study, please contact Dr. Susan Sykes in the Office of Research Ethics at 519-888-4567, ext., 36005 or by email at ssykes@uwaterloo.ca

Yours faithfully,

Abdullah Basiouni
University of Waterloo, Management Sciences
afbasiou@engmail.uwaterloo.ca
(519) 589-0551

D) Survey Items

E-Business Model Innovations Study - Survey Items

As part of my Ph.D. research, I am developing a questionnaire to measure the capabilities that help firms change their business models through adoption of e-business.

This survey contains six sections. At the beginning of each section, I describe the types of capabilities that the items in that section are intended to measure. ***For each item, please use the scale to indicate the extent to which your firm has each of the listed capabilities.***

I am seeking your help and contribution in my study to validate and confirm these measurements of the effect of firms' abilities to utilize their IT networks in the decision of IT adoption. Completing the following questions and submitting the survey implies your consent to participate in this study. Please be assured that your responses will be held in the strictest confidence. Your response will be entered into a data file with no personal identifications.

If you have any questions regarding this study, or would like additional information to assist you in reaching a decision about participation, please contact either me at (519) 589-0551, afbasiou@engmail.uwaterloo.ca, or my supervisor, Prof. Rod McNaughton at (519) 888-4567 ext. 32713, rmcnaughton@uwaterloo.ca. Further, if you would like to receive a copy of the results of this study, please contact either investigator.

This study has been reviewed and received ethics clearance through the Office of Research Ethics at the University of Waterloo. It is absolutely up to you to participate in this study. If you have any comments or concerns resulting from your participation in this study, please feel free to contact Dr. Susan Sykes, Director, Office of Research Ethics, at 1-519-888-4567, ext. 36005 or by email at ssykes@uwaterloo.ca

Thank you for your time,

Abdullah Basiouni
University of Waterloo, Management Sciences
afbasiou@engmail.uwaterloo.ca
(519) 589-0551

Part 1: Demographic Questions - This section intends to collect demographic information about all participants:

1. In what year was your firm founded?

_____

2. Where is your firm's headquarters location?

_____

3. What is the primary industry of your firm?

☐ 11 - Agriculture, Forestry, Fishing and Hunting
☐ 21 - Mining, Quarrying, and Oil and Gas Extraction
☐ 22 - Utilities
☐ 23 - Construction
☐ 31-33 - Manufacturing
☐ 41 - Wholesale Trade
☐ 44-45 - Retail Trade
☐ 48-49 - Transportation and Warehousing
☐ 51 - Information and Cultural Industries
☐ 52 - Finance and Insurance
☐ 53 - Real Estate and Rental and Leasing
☐ 54 - Professional, Scientific and Technical Services
☐ 55 - Management of Companies and Enterprises
☐ 56 - Administrative and Support, Waste Management and Remediation Services
☐ 61 - Educational Services
☐ 62 - Health Care and Social Assistance
☐ 71 - Arts, Entertainment and Recreation
☐ 72 - Accommodation and Food Services
☐ 81 - Other Services (except Public Administration)
☐ 91 - Public Administration

4. What is your position in the firm?

☐ CEO
☐ Principal owner
☐ President
☐ General Manager
☐ Staff/Employee

5. Approximately how many full-time employees does your firm have?
☐ Less than 10 ☐ 11 - 19 ☐ 20 – 49 ☐ 50 – 99
☐ 100 - 299 ☐ 300 - 499 ☐ Over 500

6. Approximately what were your total sales last year?
☐ $1 - $99,999 ☐ $100,000 - $199,999
☐ $200,000 – $499,999 ☐ $500,000 - $999,999
☐ $1,000,000 – $4,999,999 ☐ $5,000,000 - $9,999,999
☐ $10,000,000 – $24,999,999 ☐ $25,000,000 - $49,999,999
☐ $50,000,000 +

7. Approximately what percent of your firm's sales are outside Canada?
____ U.S
____ Other

8. Which of the following e-facilitating tools does your firm currently have? (Select all that apply.)
☐ Electronic Data Interchange (EDI) (i.e., transmitting business documents and data as standard messages with uniform formats)
☐ Internet
☐ Intranet (i.e., internal communicational network)
☐ Local Area Network (LAN)
☐ Wireless communication (e.g., mobile phones, wireless LANs, wireless data devices (PDA), wireless laptops, pagers)
☐ Local e-mail exchange (within the firm)
☐ Web based e-mail services
☐ Others, please specify: _____

9. Does your firm purchase ***online*** any of the materials, components, or services that are used to manufacture a product or deliver a service? (Note: this is a branching question)
☐ Yes ☐ No

If yes, in what year did your firm start to purchase online? _____

What are the categories of your purchases? (Select all that apply.)
☐ Office supplies ☐ Raw materials ☐ Component parts
☐ Software packages ☐ Machines ☐ Others, please specify: _____

How do you purchase online? (select all that apply)
☐ Online retailers ☐ Online auctions
☐ Electronic Data Interchange (EDI)
☐ Others, please specify: _____

If no, why doesn't your firm purchase online? (Select all that apply.)

☐ Products / services are not well suited to Internet Commerce
☐ Cost of online purchase is high
☐ Employees are not ready to use Internet Commerce
☐ Suppliers are not ready to use Internet Commerce
☐ Loss of personal contact with suppliers
☐ Available Internet is too slow
☐ Security concerns
☐ Prefer to maintain current business model (i.e., face-to-face interaction)
☐ Other, (please specify): _____

Part 2: Personal and Demographic Information for Online Sellers (Business Owners/Managers) - This section intends to collect demographic information about online sellers:

Online selling is the placement of product/service orders and the establishment of the purchasing commitment (i.e., via e-mail, Web site, EDI, extranet, etc.) using the Internet, whether the payment is made online or offline (i.e., via Internet, telephone, facsimile, cash, cheque, etc.), or whether the sales conducted via the firm's or others' Web sites.

Do you sell online? (Note: this is a branching question)

☐ Yes ☐ No

If yes, please answer the following questions:

1- In what year did your firm start to sell online? _____

2- Approximately what percentage of your total annual sales is from online sales? __

3- Have you been involved in any capacity in adopting online selling in your firm?

☐ Yes ☐ No

4- To what extent do you agree that your overall sales have grown as a result of online sales?

Strongly Disagree			Uncertain			Strongly Agree
1	2	3	4	5	6	7

5- How do you receive your online orders? (Select all that apply.)

☐ Your own Website*
☐ Others' Websites (e.g., online mall, client's Website)*
☐ E-mail
☐ Intermediary (agent)

☐ Online auction (e.g., eBay)
☐ Industry portal
☐ Electronic Data Interchange (EDI)
☐ Others, (please specify): _____

If * was selected, what are the items included in your or your client/agent's Website? (Select all that apply.)

☐ Brief introduction and background about the firm
☐ List of products/services
☐ List of prices
☐ Contact information
☐ Email
☐ Online payment
☐ Feedback from customers (reviews)
☐ After sale services/follow-up
☐ Business partners

6- Who maintains (i.e., administers and manages) your firm's online sales?
☐ We manage our online sales ☐ Outsourced

7- What is your target market? (Select all that apply.)
☐ Individuals ☐ Other businesses ☐ Government

8- How do you receive payment for your online sales? (Select all that apply.)
☐ Online payment
☐ Offline payment (e.g., via telephone, facsimile, cash, cheque, etc.)

9- What type of pricing does your firm use for online products/services? (Select all that apply.)
☐ Fixed pricing ☐ Dynamic pricing (e.g., auction, biding)

10- Rate the extent to which the following competencies were developed ***before*** the implementation of online sales?

- Prompt response to changes and developments

Poorly Developed			Uncertain			Highly Developed
1	2	3	4	5	6	7

- Effective communication and information sharing

Poorly Developed			Uncertain			Highly Developed
1	2	3	4	5	6	7

- Effective search for economical opportunities

Poorly Developed			Uncertain			Highly Developed
1	2	3	4	5	6	7

- Employees' skills

Poorly Developed			Uncertain			Highly Developed
1	2	3	4	5	6	7

- Managers' supports

Poorly Developed			Uncertain			Highly Developed
1	2	3	4	5	6	7

- Business process innovation

Poorly Developed			Uncertain			Highly Developed
1	2	3	4	5	6	7

- Other, (please specify): _____

11- Rate the extent to which the following competencies were developed ***during*** the implementation of online sales?

- Prompt response to changes and developments

Poorly Developed			Uncertain			Highly Developed
1	2	3	4	5	6	7

- Effective communication and information sharing

Poorly Developed			Uncertain			Highly Developed
1	2	3	4	5	6	7

- Effective search for economical opportunities

Poorly Developed			Uncertain			Highly Developed
1	2	3	4	5	6	7

- Employees' skills

Poorly Developed			Uncertain			Highly Developed
1	2	3	4	5	6	7

- Managers' supports

Poorly Developed			Uncertain			Highly Developed
1	2	3	4	5	6	7

- Business process innovation

Poorly Developed — Uncertain — Highly Developed

1 2 3 4 5 6 7

- Other, (please specify): _____

12- Rate the extent to which the following competencies were developed ***after*** the implementation of online sales?

- Prompt response to changes and developments

Poorly Developed — Uncertain — Highly Developed

1 2 3 4 5 6 7

- Effective communication and information sharing

Poorly Developed — Uncertain — Highly Developed

1 2 3 4 5 6 7

- Effective search for economical opportunities

Poorly Developed — Uncertain — Highly Developed

1 2 3 4 5 6 7

- Employees' skills

Poorly Developed — Uncertain — Highly Developed

1 2 3 4 5 6 7

- Managers' supports

Poorly Developed — Uncertain — Highly Developed

1 2 3 4 5 6 7

- Business process innovation

Poorly Developed — Uncertain — Highly Developed

1 2 3 4 5 6 7

- Other, (please specify): _____

13- Were these competencies developed specifically to sell online?

☐ Yes ☐No

14- What changes have been made by your firm in order to establish and use the online sales option? (Select all that apply.)

☐ Changes in business process ☐ Changes in staff skills

☐ Changes in organizational structure ☐ Others, (please specify): _____

15- Rate the extent to which each of the following influenced your decision to begin selling online

- Responding to competitors' initiative

Strongly Disagree			Uncertain			Strongly Agree
1	2	3	4	5	6	7

- Responding to new market standards/requirements

Strongly Disagree			Uncertain			Strongly Agree
1	2	3	4	5	6	7

- Responding to government's pressure/regulations

Strongly Disagree			Uncertain			Strongly Agree
1	2	3	4	5	6	7

- Responding to customer preferences/requirements

Strongly Disagree			Uncertain			Strongly Agree
1	2	3	4	5	6	7

- Avoiding product/service obsoleteness

Strongly Disagree			Uncertain			Strongly Agree
1	2	3	4	5	6	7

- Being able to quickly respond to future online selling related development

Strongly Disagree			Uncertain			Strongly Agree
1	2	3	4	5	6	7

- Gaining the advantage of being among first adopters

Strongly Disagree			Uncertain			Strongly Agree
1	2	3	4	5	6	7

If no, what are the barriers that prevent you from selling online: (Select all that apply.)

- ☐ Products/services are not well suited to sale via the Internet
- ☐ Cost of implementing or maintaining online sales system is high
- ☐ Employees are not ready to use Internet Commerce
- ☐ Customers are not prepared to transact online
- ☐ Insufficient level of customer demand for purchasing via the Internet
- ☐ Loss of personal contact with customers
- ☐ Available Internet is too slow
- ☐ Security concerns

☐ Don’t know how
☐ Prefer to maintain current business model (i.e., face-to-face interaction)
☐ Other, (please specify): _____

Part 3: Items to Measure Choosing IT Capability - this section is intended for all participants:

Information Technology (IT) choosing capability is the ***ability*** to select one or more information technologies (such as online selling) for possible implementation.

Rate the extent to which your firm has the following capabilities associated with choosing potential IT solutions	**Poorly developed**						**Highly developed**
	1	**2**	**3**	**4**	**5**	**6**	**7**
Items for Identifying Process							
Ability to gather business IT requirements from business IT users and managers							
Ability to collect information from external parties (e.g., competitors, clients, and customers) about IT related needs and trends							
Ability to know about new IT requirements from emerging technologies vendors.							
An established program to keep managers and employees abreast of IT related developments and trends (e.g., by attending tradeshows, conferences, reading trade journals, etc.)							
Interaction with vendors of IT solutions to keep abreast of new software, services, and related developments							

Items for Assessing Process							
Encourage employees to examine how new technology can be applied to their jobs							
Conduct pilot projects to determine the impact of new IT on business operations							
Gather information about competitors' performances with respect to new IT							
Gather information from partners and suppliers about the use of new IT							
Collect information from external experts regarding the application of new IT							
Gather information about government support programs with respect to new IT adoption							
Assessing options for internal (e.g., hosted) IT solutions vs. outsourced (e.g., outsourced) IT solutions							

Items for Filtering and Reaching a Conclusion Process							
Gather feedback from technology users, both external and internal							
Develop financial models of acquiring, implementing, and monitoring new IT							
Collect technical requirements (e.g., skills, resources) of implementing a new IT							
Collect feedback from pilot projects about new IT							
Implement clear objectives to select a specific IT solution							
Possess a formal process for approving new IT							
Evaluate IT software service providers' reliability (e.g., experience, reputation, after sale services, etc.)							
Comply with legislation or industry standards in IT selection							
Evaluate new technology integration compatibility status with other applications already installed in the firm							
Influence of internal stakeholders on selecting a specific IT solution							

Part 4: Items to Measure IT Matching Capability - this section is intended for all participants:

IT ***matching capability*** is the ***ability*** to match proposed technology benefits with the firm's potential economic opportunities.

Rate the extent to which your firm has the following capabilities of matching proposed IT benefits with the firm's potential opportunities	**Poorly developed**						**Highly developed**
	1	**2**	**3**	**4**	**5**	**6**	**7**
Items for Selecting Economic Opportunities Process							
Seek economic opportunities created or facilitated by new IT							
Seek IT solutions that create additional opportunities while solving existing problems							
Maintain a formal strategic plan that explicitly incorporates IT as a major component							
Evaluate multiple IT solutions that would possibly solve business problems							
Develop the firm's employees or clients (IT users) if outsourced to possess knowledge and experience with the new IT							
Ensure that customers possess knowledge and experience with IT							

Items for Continual Dialogue and Sense-making Process							
Employees maintain continuous interaction during the adoption process							
Managers clearly communicate the objectives and goals of the adoption							
Employees use formal and informal communications during the adoption							
Information exchanged among employees about the adoption is in easily understood language (e.g., no use of technical terms or jargon that are not commonly used within the firm)							
Market information of the new IT adoption is organized in meaningful ways							
Technical information of the new IT adoption is organized in meaningful ways							

Part 5: Items to Measure Executing Business Innovation for Growth Capability- this section is intended for all participants:

IT executing capability is the firm's ***ability*** to reconfigure its products, services, sales channels, supply chain, etc. in order to implement the new IT.

Rate the extent to which your firm has the following capabilities associated with executing business innovation needed for IT adoption	**Poorly developed**						**Highly developed**
	1	**2**	**3**	**4**	**5**	**6**	**7**
Items for Project Management Process							
The most recent IT project was completed on schedule							
The project was completed within budget							
The end product (or service) that was developed under this project works							
Use of the recently adopted IT leads to improved decision making for our firm's top management							
The adopted IT exerted a positive impact on those who use it							
You were satisfied with the process by which the project was completed							
Given a set of alternatives, this recent IT project that was developed was the best solution for the problem on hand							
The results of this IT project represent a positive improvement on those who use it							
The IT adopted by this project is used by those for whom it was intended							

Rate the extent to which your firm has the following capabilities associated with executing business innovation needed for IT adoption	Poorly developed						Highly developed
	1	2	3	4	5	6	7
Items for Employees Education Process							
Existing skills of employees who participated in the recent IT project were identified and documented							
Employees received introductory training materials about the new IT project							
Employees received training about the new IT project implementation techniques							
Employees received assistance in determining strategic training needs for future projects							
Employees received support in an effort to attend training courses for future needs							

Rate the extent to which your firm has the following capabilities associated with executing business innovation needed for IT adoption	Poorly developed						Highly developed
	1	2	3	4	5	6	7
Items for Creating Supportive Culture Process							
Managers stress quick responses to changing market conditions							
Our firm's management style encourages a high level of participation							
Our managers are dynamic and entrepreneurial							
Information is credibly and openly shared							
Our managers emphasize innovation and change							
There is a general feeling of trust and confidence among employees							
Employees feel that their ideas and information are listened to by others							

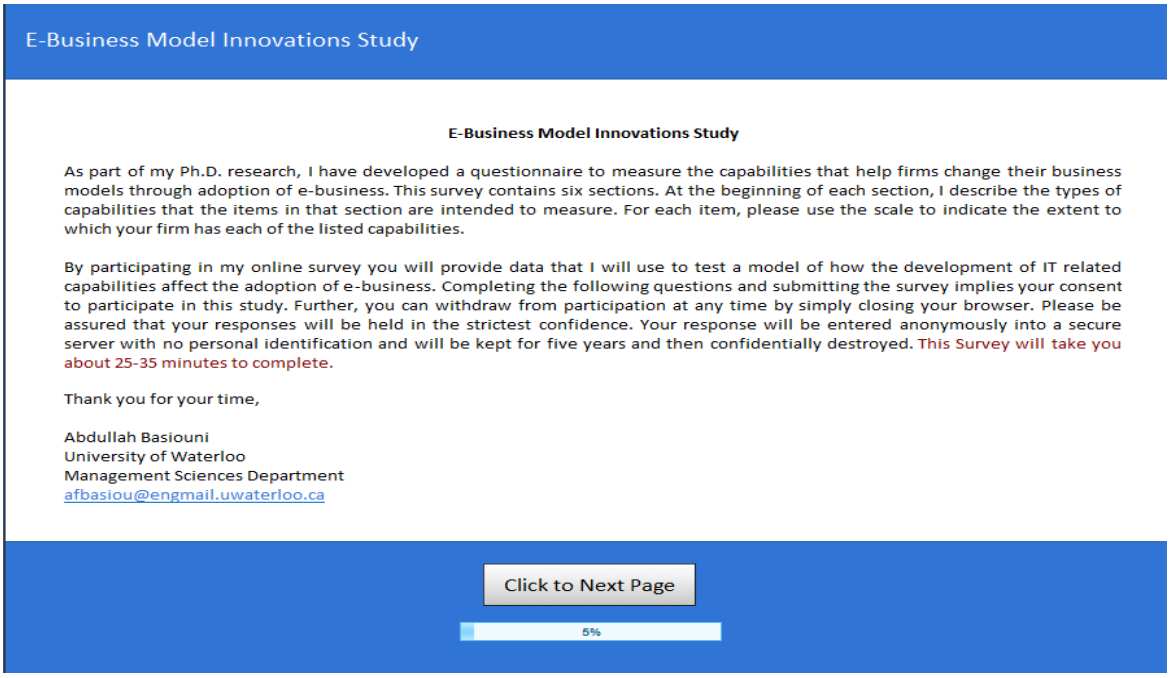
Part 6: Perceived Business Model Innovation for Online Selling - this section is intended for online sellers only:

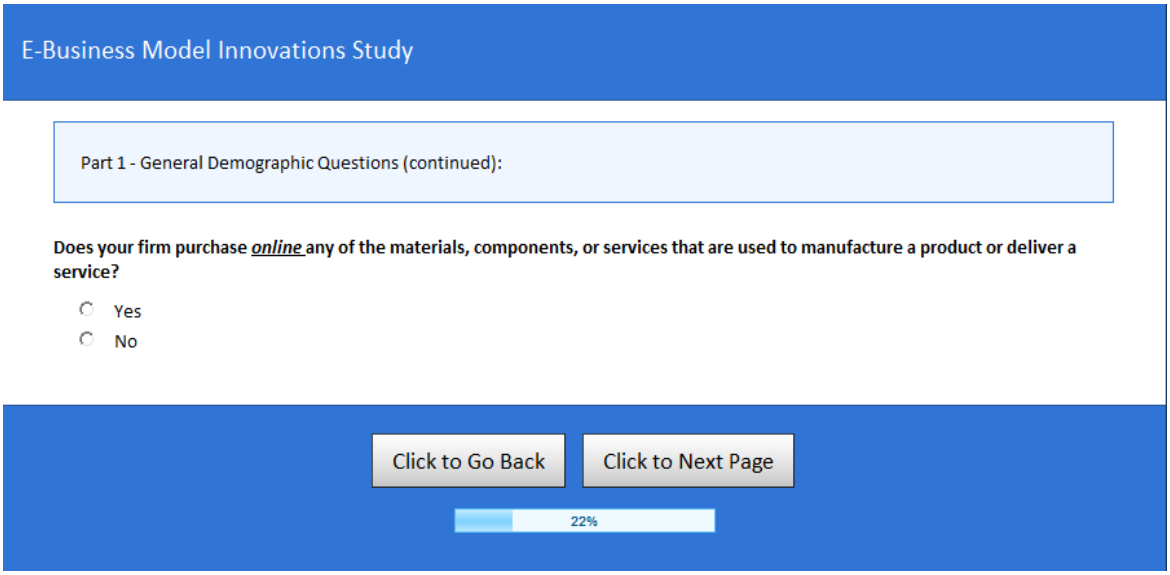
Business model innovation for online selling is the ***actual reconfiguration*** of firms' ways of doing business (i.e., products, services, procedures, etc.) for the purpose of implementing and using online sales.

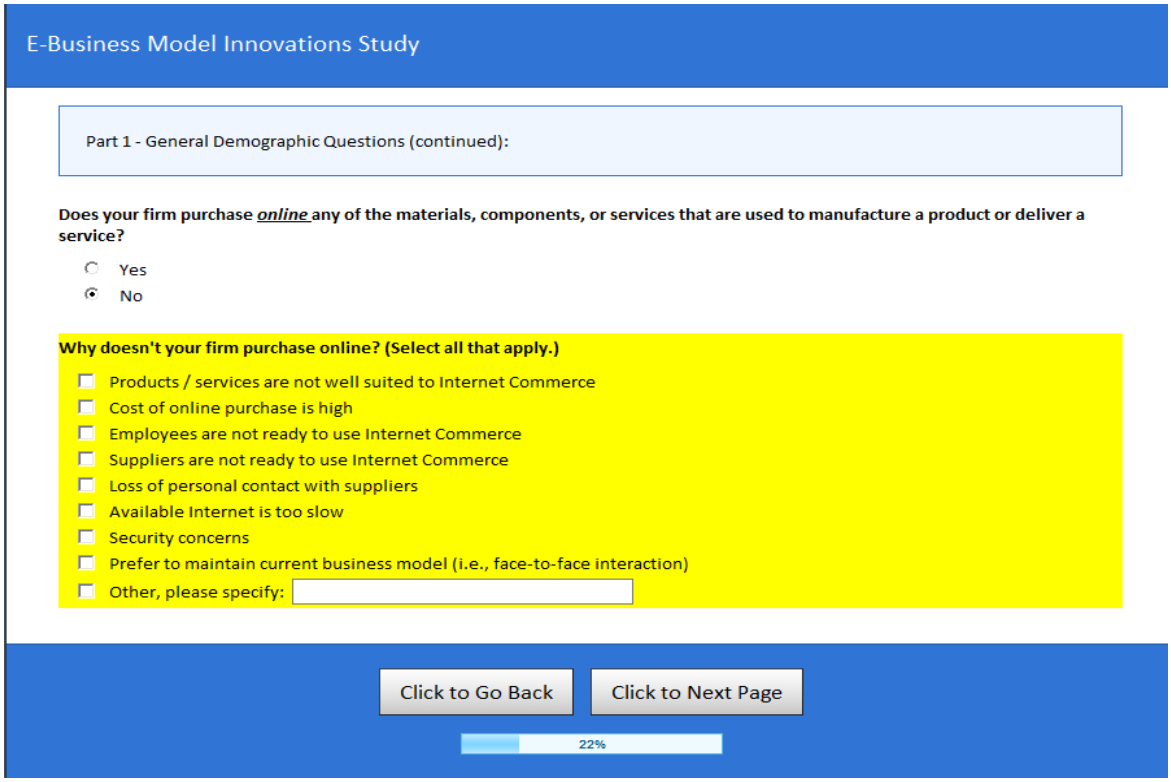
Rate the extent to which your firm had to change the following aspects of its business model to accommodate online selling	**Strongly Disagree**						**Strongly Agree**
	1	**2**	**3**	**4**	**5**	**6**	**7**
Improve product (good or service) design/package							
Increase sales channels (add new sales channels)							
Improve order placement procedures							
Increase delivery channels (add new delivery channels)							
Expand firm's geographical reach (e.g. local vs. international)							
Increase payment methods (add new payment methods)							
Improve firm's managerial control/responsibility							
Improve technologies within the firm							
Decrease perceived risk associated with online selling adoption							
Increase sales volume							
Reduce operating costs							
Increase staff efficiency							
Reduce time-to-market							

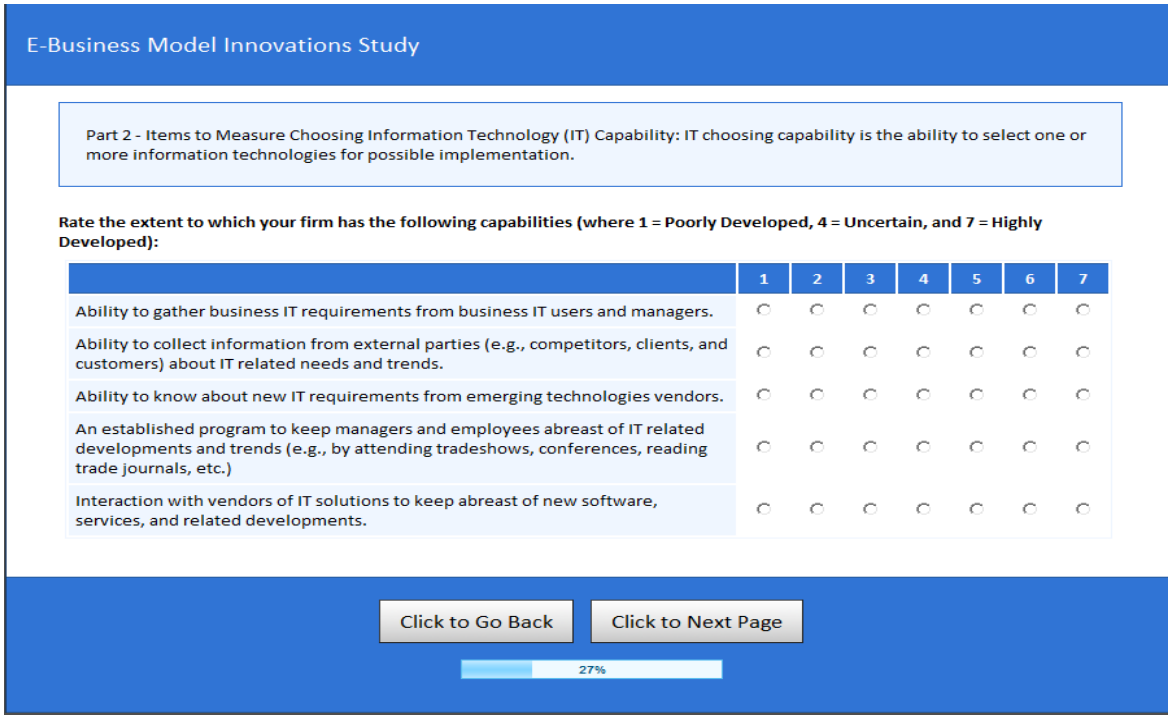
Appendix 4

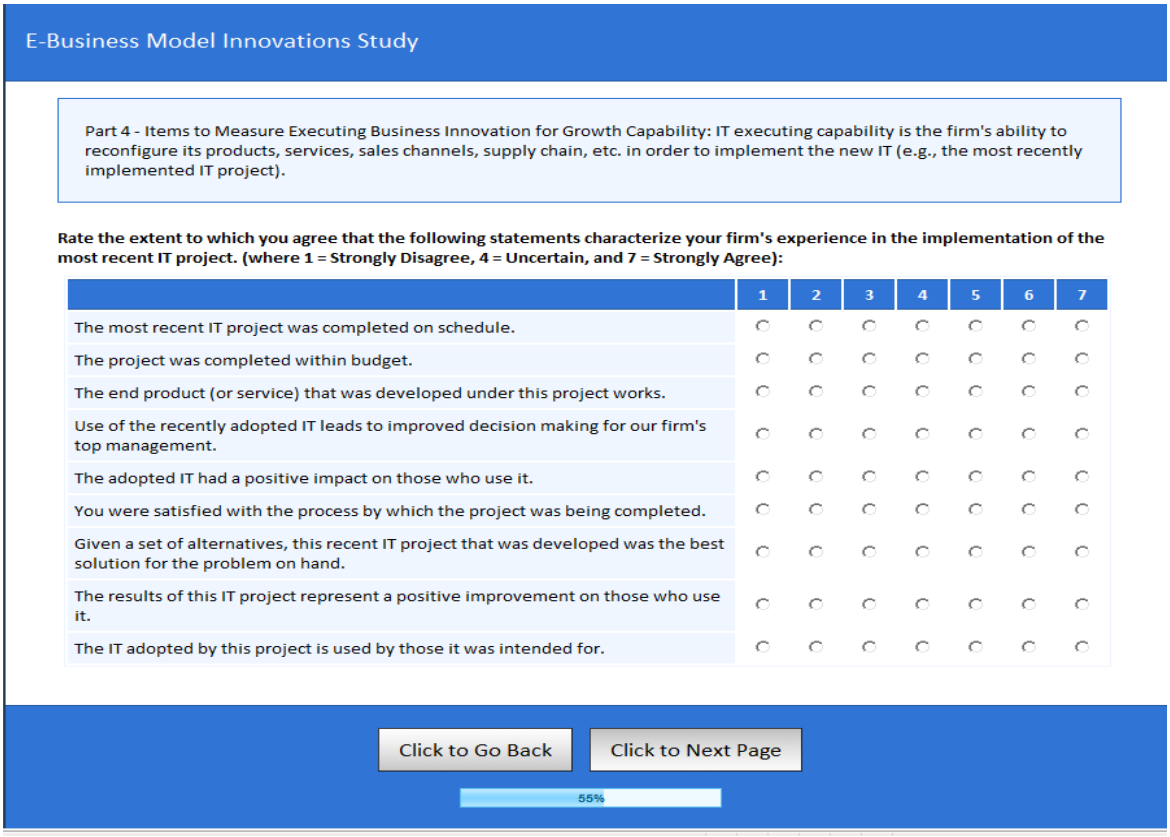
Snapshots of Actual Published Online Survey






E-Business Model Innovations Study
Part 1 - General Demographic Questions (continued):
Does your firm purchase online any of the materials, components, or services that are used to manufacture a product or deliver a service?
Yes
No
Why doesn't your firm purchase online? (Select all that apply.)
Products / services are not well suited to Internet Commerce
Cost of online purchase is high
Employees are not ready to use Internet Commerce
Suppliers are not ready to use Internet Commerce
Loss of personal contact with suppliers
Available Internet is too slow
Security concerns
Prefer to maintain current business model (i.e., face-to-face interaction)
Other, please specify:
Click to Go Back
Click to Next Page
22%


E-Business Model Innovations Study
Part 2 - Items to Measure Choosing Information Technology (IT) Capability: IT choosing capability is the ability to select one or more information technologies for possible implementation.
Rate the extent to which your firm has the following capabilities (where 1 = Poorly Developed, 4 = Uncertain, and 7 = Highly Developed):
1 2 3 4 5 6 7
Ability to gather business IT requirements from business IT users and managers.
Ability to collect information from external parties (e.g., competitors, clients, and customers) about IT related needs and trends.
Ability to know about new IT requirements from emerging technologies vendors.
An established program to keep managers and employees abreast of IT related developments and trends (e.g., by attending tradeshows, conferences, reading trade journals, etc.)
Interaction with vendors of IT solutions to keep abreast of new software, services, and related developments.
Click to Go Back
Click to Next Page
27%



E-Business Model Innovations Study

Part 4 - Items to Measure Executing Business Innovation for Growth Capability: IT executing capability is the firm's ability to reconfigure its products, services, sales channels, supply chain, etc. in order to implement the new IT (e.g., the most recently implemented IT project).

Rate the extent to which you agree that the following statements characterize your firm's experience in the implementation of the most recent IT project. (where 1 = Strongly Disagree, 4 = Uncertain, and 7 = Strongly Agree):

	1	2	3	4	5	6	7
The most recent IT project was completed on schedule.	○	○	○	○	○	○	○
The project was completed within budget.	○	○	○	○	○	○	○
The end product (or service) that was developed under this project works.	○	○	○	○	○	○	○
Use of the recently adopted IT leads to improved decision making for our firm's top management.	○	○	○	○	○	○	○
The adopted IT had a positive impact on those who use it.	○	○	○	○	○	○	○
You were satisfied with the process by which the project was being completed.	○	○	○	○	○	○	○
Given a set of alternatives, this recent IT project that was developed was the best solution for the problem on hand.	○	○	○	○	○	○	○
The results of this IT project represent a positive improvement on those who use it.	○	○	○	○	○	○	○
The IT adopted by this project is used by those it was intended for.	○	○	○	○	○	○	○

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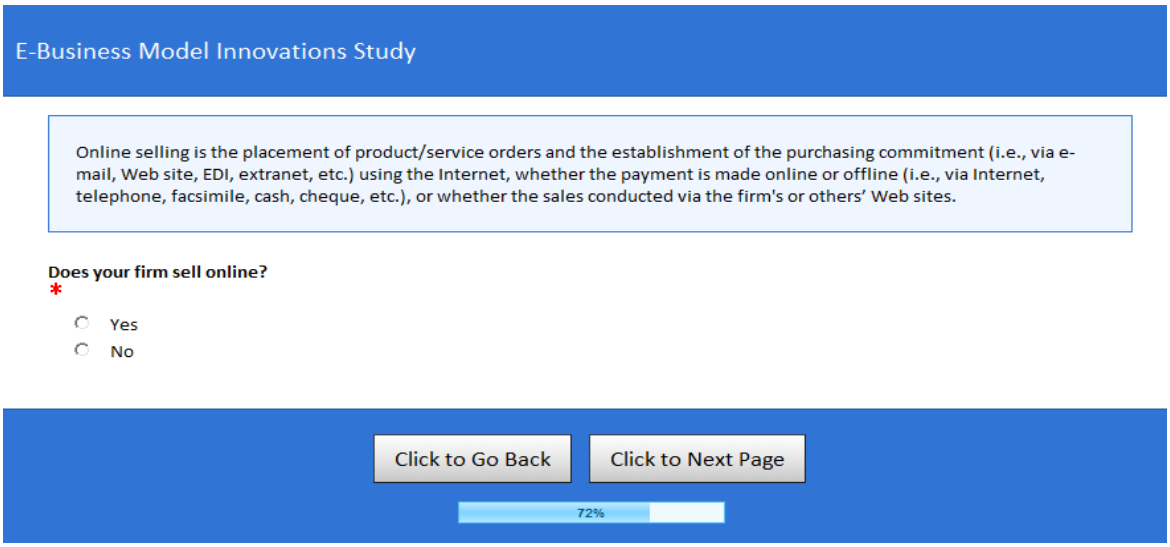
55%



E-Business Model Innovations Study

Online selling is the placement of product/service orders and the establishment of the purchasing commitment (i.e., via e-mail, Web site, EDI, extranet, etc.) using the Internet, whether the payment is made online or offline (i.e., via Internet, telephone, facsimile, cash, cheque, etc.), or whether the sales conducted via the firm's or others' Web sites.

Does your firm sell online?
*

○ Yes
○ No

Click to Go Back | Click to Next Page

72%

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Please rate the importance of each of the following barriers that may prevente you from selling online (where 1 = Not important at all, 4 = Neutral and 7 = Very important):

	1	2	3	4	5	6	7
Products/services are not well suited to sale via the Internet.	○	○	○	○	○	○	○
Cost of implementing or maintaining online sales system is high.	○	○	○	○	○	○	○
Employees are not ready to use Internet Commerce.	○	○	○	○	○	○	○
Customers are not prepared to transact online.	○	○	○	○	○	○	○
Insufficient level of customer demand for purchasing via the Internet.	○	○	○	○	○	○	○
Loss of personal contact with customers.	○	○	○	○	○	○	○
Available Internet is too slow.	○	○	○	○	○	○	○
Security concerns.	○	○	○	○	○	○	○
Don't know how.	○	○	○	○	○	○	○
Prefer to maintain current business model (i.e., face-to-face interaction).	○	○	○	○	○	○	○

Other, (please specify):

Click to Go Back | Click to Next Page

97%

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Part 5 - Perceived Business Model Innovation for Online Selling: Business model innovation for online selling is the actual reconfiguration of firms' ways of doing business (i.e., products, services, procedures, etc.) for the purpose of implementing and using online sales.

Rate the extent to which you agree that your firm *had to change* the following aspects of its business model to accommodate online selling (where 1 = Strongly Disagree, 4 = Uncertain, and 7 = Strongly Agree):

	1	2	3	4	5	6	7
Product (good or service) design/package.	○	○	○	○	○	○	○
Sales channels (add new sales channels).	○	○	○	○	○	○	○
Order placement procedures.	○	○	○	○	○	○	○
Delivery channels (add new delivery channels).	○	○	○	○	○	○	○
Firm's geographical reach (e.g. local vs. international).	○	○	○	○	○	○	○
Payment methods (add new payment methods).	○	○	○	○	○	○	○
Firm's managerial control/responsibility.	○	○	○	○	○	○	○
Technologies within the firm.	○	○	○	○	○	○	○
Perceived risk associated with online selling adoption.	○	○	○	○	○	○	○
Sales volume.	○	○	○	○	○	○	○
Operating costs.	○	○	○	○	○	○	○
Staff efficiency.	○	○	○	○	○	○	○
Time-to-market.	○	○	○	○	○	○	○

Click to Go Back | Click to Next Page

E-Business Model Innovations Study

Are you interested in the research findings? If so, please write your email address below:

Click to Go Back | Finished? Submit your Survey

97%

E-Business Model Innovations Study

E-Business Model Innovations Study – Thank You for Your Participation

Dear Participant,

I would like to thank you for your participation in this study. You have contributed to the study by providing your perception about the measurement items. Please remember that any data collected from you will be kept confidential and anonymous. Once all the data are collected and analyzed for this study, all data collected will be destroyed and deleted after five years. If you are interested in receiving more information regarding the results of this study, or if you have any questions or concerns, please contact me at either the phone number or email address listed at the bottom of the page.

I also want to assure you that this project was reviewed by, and received ethics clearance through, the Office of Research Ethics at the University of Waterloo. Should you have any comments or concerns resulting from your participation in this study, please contact Dr. Susan Sykes in the Office of Research Ethics at 519-888-4567, ext., 36005 or by email at ssykes@uwaterloo.ca

Yours faithfully,

Abdullah Basiouni
University of Waterloo, Management Sciences
afbasiou@engmail.uwaterloo.ca

Close Survey

100%

Appendix 5

Targeted Sample and Collected Responses

Sectors with above-average of online selling adoption rates (average percentage of online selling firms per sector, more than or equal 9 percent*)

NAICS	Sector Name	Online Selling Rate (%)**	# of Firms (CCC)***	# of Firms with email	# of Firms Participated	# of Valid Responses	# of Online Sellers
31-33	Manufacturing	11.15	14291	10685	179	110	37
41	Wholesale Trade	12.22	5031	4208	65	36	16
44-45	Retail Trade	15.33	1547	1227	57	28	16
51	Information and Cultural Industries	27.15	1863	1677	79	46	24
61	Educational Services	17.11	1880	1708	78	45	29
71	Arts, Entertainment and Recreation	20.30	303	274	27	14	7
91	Public Administration	16.97	67	59	14	7	4
Total			**24982**	**19838**	**499**	**286**	**133**

Sectors with below the average of online selling adoption rate (average percentage of online selling firms per sector, less than 9 percent*)

NAICS	Sector Name	Online Selling Rate (%)**	# of Firms (CCC)***	# of Firms with email	# of Firms Participated	# of Valid Responses	# of Online Sellers
11	Agriculture, Forestry, Fishing and Hunting	5.75	293	169	22	14	6
21	Mining and Oil and Gas Extraction	0.21	304	234	13	8	2
22	Utilities	2.08	58	45	14	10	4
23	Construction	2.59	1859	1354	34	22	5
48-49	Transportation and Warehousing	2.40	1262	1021	28	19	6
52	Finance and Insurance	5.79	660	548	20	13	5
53	Real Estate and Rental and Leasing	8.85	581	507	7	5	2
54	Professional, Scientific and Technical Services	7.61	15203	13574	436	264	63
55	Management of Companies and Enterprises	3.93	41	36	36	25	10

NAICS	Sector Name	Online Selling Rate (%)**	# of Firms (CCC)***	# of Firms with email	# of Firms Participated	# of Valid Responses	# of Online Sellers
56	Administrative and Support, Waste Management and Remediation Services	7.25	1937	1675	9	4	0
62	Health Care and Social Assistance	1.3	270	246	25	14	5
72	Accommodation and Food Services	6.86	245	218	4	2	1
81	Other Services (Except Public Administration)	6.91	2071	1676	241	124	54
Total			**24784**	**21303**	**889**	**524**	**163**
Unclassified					**709**	**1**	
Grand Total			**49766**	**41141**	**2097**	**811**	**296**

Targeted sample and responses breakdown per sector and per online selling use.

* The original reported average was 8.02%. This was rounded to 9% to include the sector of "Real Estate and Rental and Leasing (53)" which is very closer to lower online selling sectors compared to higher online selling sectors.

Sources:

** Adopted from table 358-0010 as of year 2006 (Statistics Canada, 2007).

*** CCC published data (Industry Canada, 2009), and the research findings.

Appendix 6

Demographic Items of the Survey

Label	Item
Var2	In what year was your firm founded?
Var3	Where is your firm's headquarters location?
Var4	What is the primary industry of your firm?
Var7	What is your position in the firm?
Var8	Approximately how many full time employees does your firm have?
Var10	Approximately what were your total sales last year?
Var11	Approximately what percent of your firm's sales are in Canada, U.S., other countries?
Var15	Which of the following e facilitating tools does your firm currently have: Electronic Data Interchange (EDI), Internet, Intranet, LAN, Wireless communication, Local e-mail exchange, Web based e-mail services, others

General Demographic Items

Label	Item
var16	Does your firm purchase online any of the materials components or services that are used to manufacture a product or deliver a service?
var17	In what year did your firm start to purchase online?
var18	What are the categories of your purchases: Office supplies, Raw materials, Component parts, Software packages, Machines, others?
var19	How do you purchase online: Online retailers, Online auctions, EDI, Others?

Demographic Items for Online Buyers

Label	Item
var166	Products services are not well-suited to sell via the Internet.
var167	The cost of implementing or maintaining online sales system is high.
var168	Employees are not ready to use Internet commerce.
var169	Customers are not prepared to transact online.
var170	Insufficient level of customer demand for purchasing via the Internet.
var171	Loss of personal contact with customers.
var172	Available Internet is too slow,
var173	Security concerns.
var174	Don't know how.
var175	Prefer to maintain current business model, for example, face-to-face interaction.

Demographic items for non-online sellers

Label	Item
var23	In what year did your firm start to sell online?
var24	Approximately what percentage of your last year total sales is from online sales?
var27	Have you been involved in any capacity in adopting online selling in your firm?
var28	To what extent do you agree that your overall sales have grown as a result of online sales?
var29	How do you receive your online orders: Your own Web site, Others' Web sites, Email Intermediary, Online auction, Industry portal, EDI, Others,
var30	What are the items included in your or your client agent's Web site - Brief introduction and background about the firm, List of products/services, List of prices, Contact information, Email, Online payment, Feedback from customers, After sale services/follow-up, Business partners
var31	Who maintains your firm's online sales?
var32	What is your target market: individuals, other businesses, government?
var33	How do you receive payment for your online sales: online payment, offline payment?
var34	What type of pricing does your firm use for online products services: fixed pricing or dynamic pricing?
var36	Prompt response to changes and developments.
var37	Effective communication and information sharing.
var38	Effective search for economical opportunities,
var39	Employees' skills.
var40	Managers' support.
var41	Business process innovation.
var43	Other; Please specify:
var45	Prompt response to changes and developments.
var46	Effective communication and information sharing.
var47	Effective search for economical opportunities.
var48	Employees' skills.
var49	Managers' support.
var50	Business process innovation.
var51	Other; Please specify.
var53	Prompt response to changes and developments.
var54	Effective communication and information sharing.
var55	Effective search for economical opportunities.
var56	Employees' skills.
var57	Managers' support.
var58	Business process innovation,
var59	Other; Please specify.
var60	Were these competencies developed specifically to sell online?
var61	What changes have been made by your firm in order to establish and use the online? Sales option - Changes in business process, Changes in staff skills, Changes in organizational structure, Others.
var63	Responding to competitors' initiatives.
var64	Responding to new market standards requirements.
var65	Responding to government pressure regulations.
var66	Responding to customer preferences requirements.
var67	Avoiding product service obsoleteness.
var68	Being able to quickly respond to future online selling related development.
var69	Gaining the advantage of being among first adopters.

Demographic Items for Online Sellers

Appendix 7
SEM Results

Factor/dimension/ variable	←	Factor/dimension/ variable	S.E.	C.R.	P-value	Standard Estimate	SMC
MEO	←	CET	0.069	10.211	<0.001	0.913	0.834
EITBIG	←	MEO	0.09	7.241	<0.001	0.882	0.778
BMIOS	←	EITBIG	0.163	3.44	<0.001	0.331	0.110
Identifying	←	CET	0.078	10.942	<0.001	0.878	0.771
Assessing	←	CET	0.077	12.845	<0.001	0.931	0.867
Filtering	←	CET	0.074	13.919	<0.001	0.986	0.972
RC	←	CET	Fixed	Fixed	<0.001	0.968	0.937
SEO	←	MEO	Fixed	Fixed	<0.001	0.967	0.935
CDS	←	MEO	0.107	9.785	<0.001	0.857	0.734
CSC	←	EITBIG	Fixed	Fixed	<0.001	0.698	0.487
EE	←	EITBIG	0.171	6.978	<0.001	0.845	0.714
PM	←	EITBIG	0.179	6.88	<0.001	0.848	0.719
var72	←	Identifying	0.081	12.144	<0.001	0.83	0.63
var73	←	Identifying	0.074	11.71	<0.001	0.81	0.56
var74	←	Identifying	0.077	13.677	<0.001	0.895	0.74
var75	←	Identifying	0.085	11.557	<0.001	0.803	0.67
var79	←	Assessing	0.065	10.275	<0.001	0.705	0.50
var76	←	Identifying	Fixed	Fixed	<0.001	0.828	0.71
var80	←	Assessing	0.066	12.596	<0.001	0.798	0.65
var81	←	Assessing	0.065	14.029	<0.001	0.846	0.70
var82	←	Assessing	0.061	15.503	<0.001	0.889	0.79
var83	←	Assessing	0.06	15.019	<0.001	0.875	0.71
var84	←	Assessing	0.075	11.381	<0.001	0.752	0.51
var85	←	Assessing	Fixed	Fixed	<0.001	0.875	0.69
var87	←	Filtering	0.065	13.347	<0.001	0.824	0.64
var88	←	Filtering	0.071	13.034	<0.001	0.813	0.67
var89	←	Filtering	0.062	15.735	<0.001	0.894	0.81
var90	←	Filtering	Fixed	Fixed	<0.001	0.875	0.77
var91	←	RC	Fixed	Fixed	<0.001	0.88	0.71
var92	←	RC	0.079	11.989	<0.001	0.774	0.65
var93	←	RC	0.062	14.735	<0.001	0.864	0.77
var94	←	RC	0.078	11.165	<0.001	0.741	0.63
var95	←	RC	0.063	14.776	<0.001	0.865	0.76

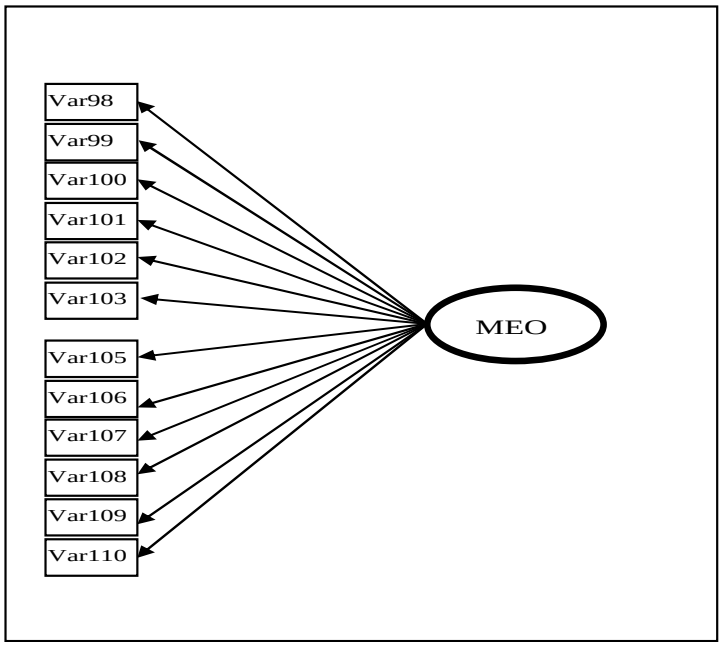
var98	←	SEO	Fixed	Fixed	<0.001	0.776	0.70
var99	←	SEO	0.092	12.235	<0.001	0.892	0.81
var100	←	SEO	0.115	10.211	<0.001	0.775	0.59
var101	←	SEO	0.102	12.003	<0.001	0.879	0.79
var102	←	SEO	0.1	11.664	<0.001	0.86	0.67
var103	←	SEO	0.098	8.036	<0.001	0.634	0.37
var105	←	CDS	Fixed	Fixed	<0.001	0.884	0.80
var106	←	CDS	0.062	15.381	<0.001	0.875	0.80
var107	←	CDS	0.057	16.386	<0.001	0.9	0.81
var108	←	CDS	0.062	15.429	<0.001	0.877	0.77
var109	←	CDS	0.063	15.619	<0.001	0.882	0.73
var110	←	CDS	0.063	15.398	<0.001	0.876	0.72
var116	←	PM	Fixed	Fixed	<0.001	0.719	0.48
var117	←	PM	0.106	9.066	<0.001	0.745	0.56
var118	←	PM	0.106	11.129	<0.001	0.907	0.79
var119	←	PM	0.106	9.935	<0.001	0.814	0.63
var120	←	PM	0.102	11.327	<0.001	0.923	0.86
var121	←	PM	0.105	9.717	<0.001	0.797	0.66
var129	←	PM	0.1	10.761	<0.001	0.879	0.76
var130	←	PM	0.101	11.574	<0.001	0.942	0.88
var131	←	PM	0.097	11.058	<0.001	0.902	0.72
var123	←	EE	0.113	10.134	<0.001	0.808	0.62
var124	←	EE	0.109	11.15	<0.001	0.879	0.75
var125	←	EE	0.105	11.191	<0.001	0.882	0.80
var126	←	EE	0.11	10.805	<0.001	0.855	0.74
var127	←	EE	Fixed	Fixed	<0.001	0.749	0.61
var133	←	CSC	0.09	8.31	<0.001	0.606	0.46
var134	←	CSC	0.067	14.699	<0.001	0.866	0.77
var135	←	CSC	0.068	14.875	<0.001	0.871	0.77
var136	←	CSC	0.063	16.484	<0.001	0.913	0.83
var137	←	CSC	0.071	14.125	<0.001	0.849	0.76
var138	←	CSC	0.066	15.793	<0.001	0.896	0.76
var139	←	CSC	Fixed	Fixed	<0.001	0.875	0.76

var141	←	BMIOS	Fixed	Fixed	<0.001	0.698	0.46
var142	←	BMIOS	0.113	8.102	<0.001	0.698	0.52
var143	←	BMIOS	0.108	7.894	<0.001	0.68	0.48
var144	←	BMIOS	0.113	8.624	<0.001	0.745	0.54
var145	←	BMIOS	0.118	6.93	<0.001	0.595	0.44
var146	←	BMIOS	0.115	7.885	<0.001	0.679	0.44
var147	←	BMIOS	0.11	9.174	<0.001	0.795	0.62
var148	←	BMIOS	0.101	8.656	<0.001	0.748	0.59
var149	←	BMIOS	0.111	8.37	<0.001	0.722	0.49
var150	←	BMIOS	0.1	8.921	<0.001	0.772	0.57
var151	←	BMIOS	0.104	9.458	<0.001	0.82	0.67
var152	←	BMIOS	0.1	9.394	<0.001	0.815	0.64
var153	←	BMIOS	0.11	9.783	<0.001	0.85	0.72

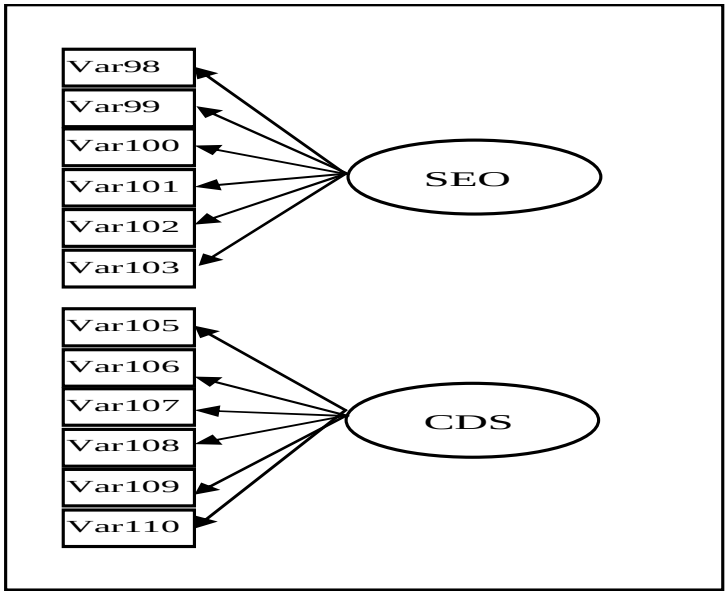
Appendix 8

Second-Order Hierarchical Analysis Figures

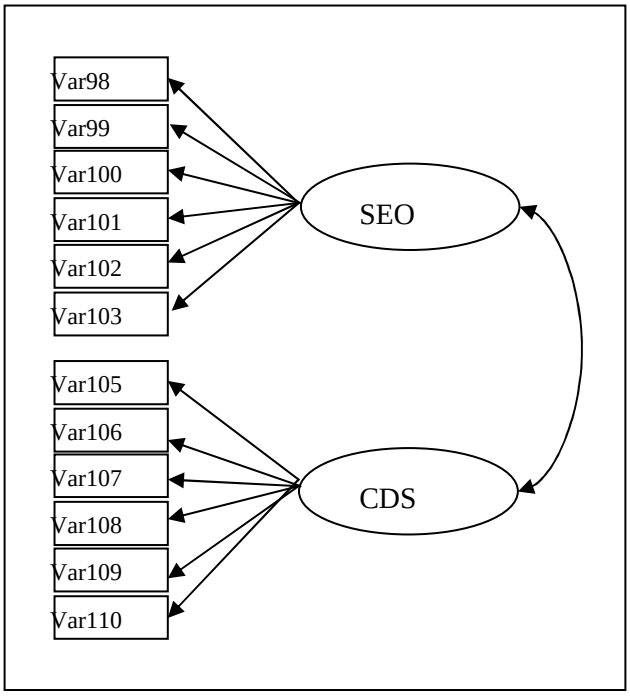
Matching Economic Opportunities (MEO) Construct



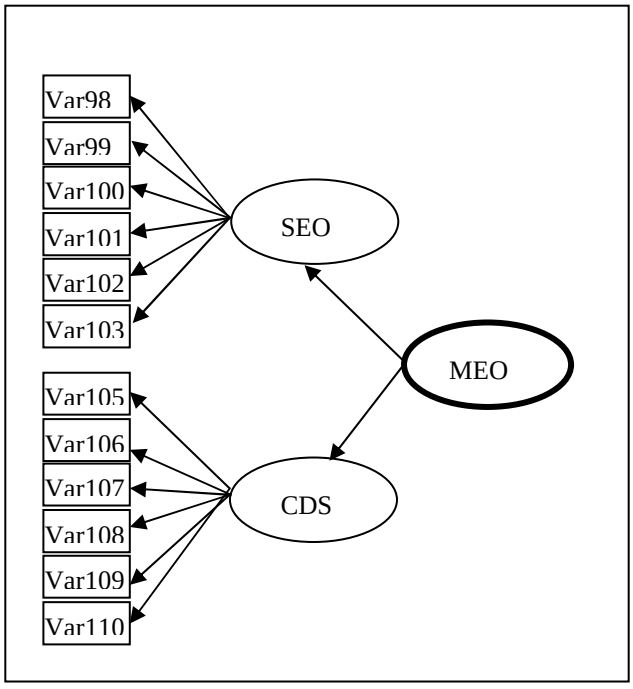
MEO model with one first-order factor (Model 1).



MEO model with two first-order uncorrelated factors (Model 2).

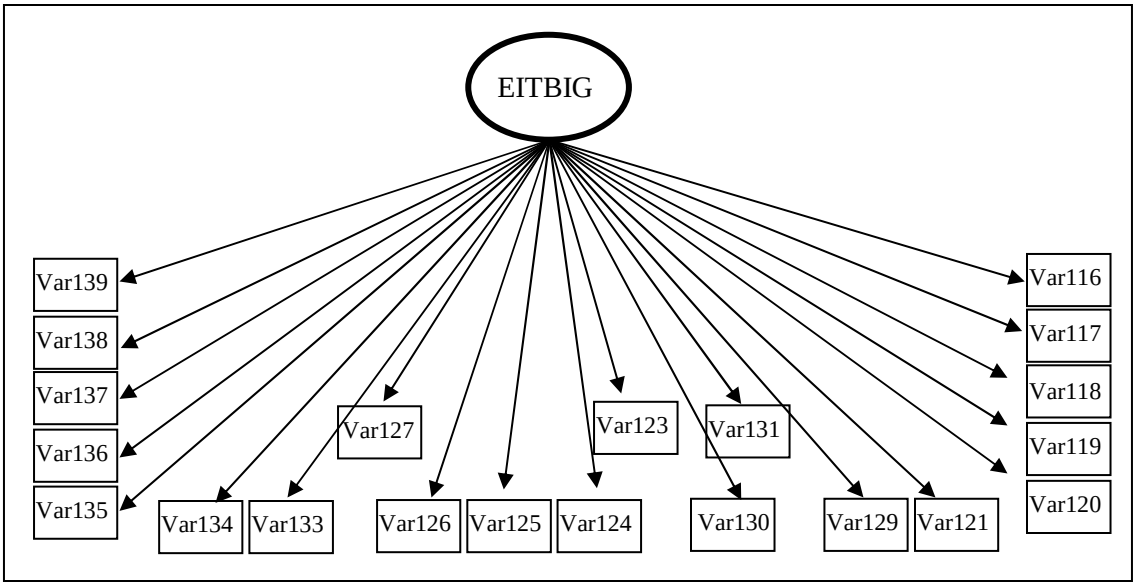


MEO model with two first-order correlated factors (Model 3).

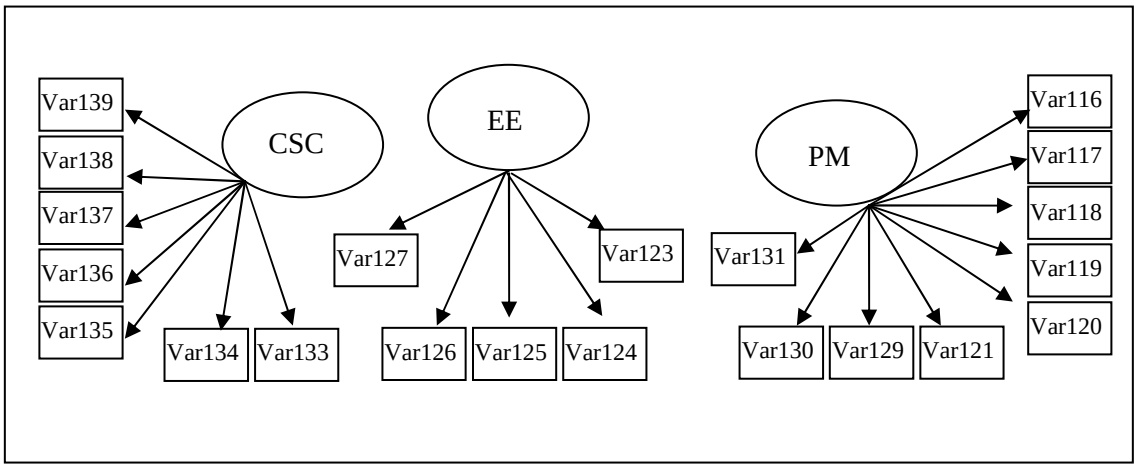


MEO model with two first-order factors and one second-order factor (Model 4).

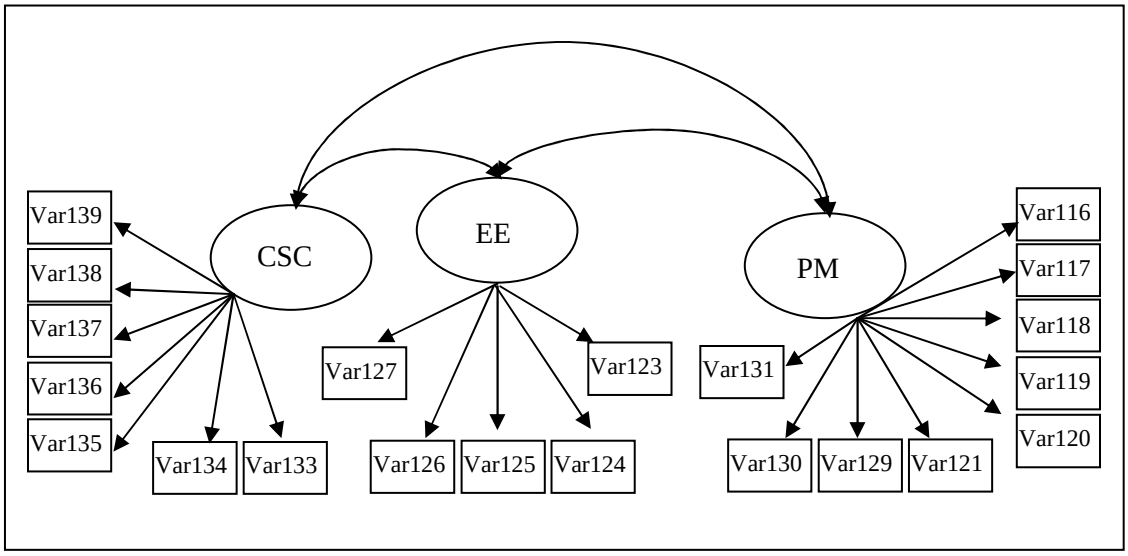
Executing Information Technology as Business Innovation for Growth (EITBIG) Construct



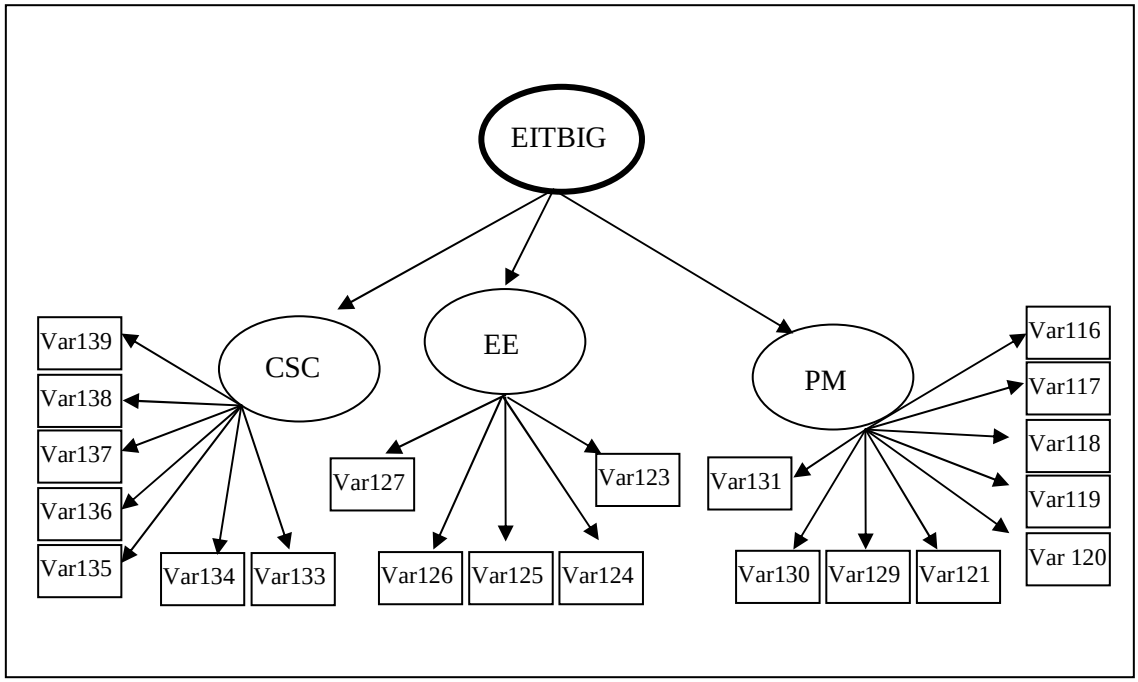
EITBIG model with one first-order factor (Model 1)



EITBIG model with three first-order uncorrelated factors (Model 2)



EITBIG model with three first-order correlated factors (Model 3)



EITBIG model with three first-order factors and one second-order factor (Model 4)

Bibliography

Afuah, A. and Tucci, C. (2003). *Internet business models and strategies: text and cases*. New York: McGraw-Hill.

Akgun, A., Lynn, G., and Yilmaz, C. (2006). Learning process in new product development teams and effects on product success: a socio-cognitive perspective. *Industrial Marketing Management*, 35, 210 – 224.

Allen, D., Colligan, D., Finnie, A. and Kern, T. (2000). Trust, power and interorganizational systems: the case of the electronic trading community TransLease. *Info. Systems J.*, 10, 21-40.

Alojairi, A., and Safayeni, F. (2012). The dynamics of inter-node coordination in social networks: a theoretical perspective and empirical evidence. *International Journal of Project Management*, 30, 15-26.

Amit, R., and Zott, C. (2001). Value creation in e-business. *Strategic Management Journal*, 22, 493-521.

Anderson, E. (1988). Strategic Implications of Darwinian Economics for Selling Efficiency and Choice of Integrated or Independent Sales Forces. *Management Science*, 34(5), 599-618.

Anthony, S. Eyring, M. and Gibson, L. (2006). Mapping your innovation strategy. *Harvard Business* Review, 84(5), 104-113.

Arbuckle, J. L. and Wothke, W. (2004). *AMOS 4.0 User's Guide*. SPSS, Chicago, IL.

Armstrong, J. S. and Overton, T. S. (1977). Estimating nonresponse bias in mail surveys. *Journal of Marketing Research*, 14, 396-402.

Attewell, P. (1992). Technology diffusion and organizational learning: the case of business computing. *Organization Science*, 3(1), 1-19.

Bailetti, A., and Guild, P. (1991). A method for projects seeking to merge technical advancements with potential markets. *R&D Management*, 21(4), 291-300.

Bagozzi, R. P. and Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, 16(1),74–94.

Bakker, C. (2000). Information and communications technologies and electronic commerce in Canadian industry: Survey of information and communications technologies and electronic commerce. *Statistics Canada*, Cat. No. 88F0006XIB-00004.

Bakos, Y. (1997). Reducing buyer search costs: Implications for electronic marketplaces. *Management Science*, 43(12), 1676-1692.

Baruch, Y. and Holtom, B. C. (2008). Survey response rate levels and trends in organizational research. *Human Relations*, 61(8), 1139–1160.

Bendoly, E. (2007). Resources enablement modeling: implications for studying the diffusion of technology. *European Journal of Operational Research*, 179, 537-553.

Blunch, N. (2008). *Introduction to structural equation modeling using SPSS and AMOS*. Sage, London.

Boritz, E. (2003). *Computer Control & Audit Guide*. Center of information systems assurance, University of Waterloo.

Boritz, E., Mackler, E. and McPhie, D. (1999). Reporting on systems reliability. *Journal of Accountancy*, 188(5), 75-87.

Boritz, E and No, W. (2005). Security in XML-based financial reporting services on the internet. *Journal of Accounting and Public Policy*, 24, 11-35.

Bosch, F., Volberda, H., and Boer, M. (1999). Coevolution of firm absorptive capacity and knowledge environment: organizational forms and combinative capabilities. *Organization Science*, 10(5), 551-568.

Bostrom, R., and Heinen, J. (1977). MIS problems and failures: a socio-technical perspective – part II: the application of socio-technical theory. *MIS Quarterly*, December, 11-28.

Boynton, A., Zmud, R., and Jacobs, G. (1994). The influence of IT management practice on IT use in large organizations. *MIS Quarterly*, 18(3), 299-318.

Brock, E., and Boonstra, A. (2003). A framework and a tool to generate e-business options. SOM Research Report 03A11. *University of Groningen*. Retrieved March 5, 2008, from http://irs.ub.rug.nl/ppn/248270257

Bryceson, K. (2011). "The Agri-Food Industry and the E-Landscape". In Bak, O., and Stair, N. (Eds.) *Impact of E-business Technologies on Public and Private Organizations: Industry Comparisons and Perspectives* (pp. 198-213). Business Science Reference (an imprint of IGI Global), Hershey, PA, USA.

Byrne, B. (2001). Structural Equation Modeling With AMOS, EQS, and LISREL: Comparative Approaches to Testing for the Factorial Validity of a Measuring Instrument. *International Journal of Testing*, 1 (1), 55-86.

Byrne, B. (2009). *Structural equation modeling with AMOS: basic concepts, applications, and programming*. Routledge, New York.

Cameron, K., and Quinn, R. (1999). *Designing and Changing Organizational Culture: Based on the Competing Value Framework*. Addison-Wesley Publishing Company Inc, Reading, Massachusetts.

Campbell, D. (1955). The informant in quantitative research. *The American Journal of Sociology*, 60(4), 339-342.

Campbell, D. and Fiske, D. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, 56(2), 89–105.

Camponovo, G., and Pigneur, Y. (2003). Business model analysis applied to mobile business. *ICEIS*, 4, 173-183.

Carlson, D. and Kacmar, K. (2000). Work–family conflict in the organization: Do life role values make a difference?. *Journal of Management*, 26(5), 1031–1054.

Carr, N. (2003). IT doesn't matter. *Harvard Business Review*, 81(5), 41-49.

Chang, S., Witteloostuijn, A., and Eden, L. (2010). From the editors: Common method variance in international business research. *Journal of International Business Studies*, 41, 178–184.

Chesbrough, H. (2003). *Open innovation: the new imperative for creating and profiting from technology*. Harvard Business School Press, Boston.

Chesbrough, H. (2007). Business model innovation: it's not just about technology anymore. *Strategy and Leadership*, 35(6), 12-17

Chesbrough, H. and Rosenbloom, R. (2002). The role of the business model in capturing value from business innovation: evidence from Xerox Corporation's technology spin-off companies. *Industrial and Corporate Change*, 11(3), 529-555.

Chin, W. (1988). Issues and opinion on structural equation modeling. *MIS Quarterly*, 22(1), vii-xvi.

Christensen, P., Madsen, O., and Peterson, R. (1994). "Conceptualizing Entrepreneurship Opportunity Identification", in Hills, G. (Ed). *Marketing and Entrepreneurship*, Greenwood Press, CT, USA.

Churchill, G. (1979). A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research,* 16 (1), 64-73.

Ciborra, C. (2009). *The Labyrinths of Information: Challenging the Wisdom of Systems*. Oxford University Press, New York.

Clayton, M., and Pett, M. (2008). AMOS versus LISREL: One data set, two analyses. *Nursing Research,* 57(4), 283-292.

Cobanoglu, C., Warde, B., and Moreo, P. (2001). A comparison of mail, fax and web-based survey methods. *International Journal of Market Research,* 43(4), 441-452.

Cohen, W., and Levinthal, D. (1990). Absorptive capacity: a new perspective on learning and innovation. *Administrative Science Quarterly,* 35(1), 128-152.

Coltman, T., Devinney, T., Midgley, D., and Venaik, S. (2008). Formative versus reflective measurement models: two applications of formative measurement. *Journal of Business Research,* 61, 1250–1262.

Conklin, D., and Trudeau, M. (2000). The e-tail revolution: challenges and limitations. *Ivey Business Journal,* 64(4), 44-50.

Cook, B. (2004). *Measuring the Value of Success in Project Management Organizations*. Ph D. dissertation. University-Orange County, Graduate School of Argosy.

Cook, C., Heath, F., and Thompson, R. (2000). A Meta-Analysis of Response Rates in Web- or Internet-Based Surveys. *Educational and Psychological Measurement,* 60(6), 821-836.

Corbett, A. (2002). *Opportunity Recognition: a Learning and Cognitive Approach.* Ph. D. dissertation. University Of Colorado, Department Of Management.

Costello, A., and Osborne, J. (2005). Best practices in exploratory factor analysis: four recommendations for getting the most from your analysis. *Practical Assessment, Research & Evaluation,* 10(7), 1–9.

Creswell, J. (1994). *Research Design: Qualitative and Quantitative Approaches*. Sage.

Cyert, R., and March, J. (1963). *A behavioral theory of the firm*. Englewood Cliffs, New Jersey.

Daghfous, A., Al-Nahas, N. (2006). The role of knowledge and capability evaluation in e-business strategy. *S.A.M. Advanced Management Journal,* 71(2), 11-45.

Daniel, E., and Grimshaw, D. (2002). An exploratory comparison of electronic commerce adoption in large and small enterprises. *Journal of Information Technology*, 17, 133-147.

Davis, F. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly,* 13(3), 319–339.

de Leeuw, E. D., Hox, J. J., and Dillman, D. A. (2008). *International Handbook of Survey Methodology (European Association of Methodology Series).* Lawrence Erlbaum Associates.

Debbie, H., and Oliver, M. (2011). "Diversity and Design: An Emergent Model of Matching Curricula Design to Student Need". In Bak, O., and Stair, N. (Eds.) *Impact of E-business Technologies on Public and Private Organizations: Industry Comparisons and Perspectives* (pp. 1-19). Business Science Reference (an imprint of IGI Global), Hershey, PA, USA.

DeVellis, R. (2003). *Scale Development-Theory and Applications, volume 26 of Applied Social Research Methods Series*. Sage, second edition.

Diamantopoulos, A. and Siguaw, J. (2006). Formative versus reflective indicators in organizational measure development: A comparison and empirical illustration. *British Journal of Management*, 17, 263–282.

Diekhoff, G. (1996). *Basic Statistics for the Social and Behavioural Sciences*. Prentice Hall, Upper Saddle River, New Jersey

Dillman, D. A. (2000). *Mail and Internet Surveys: The Tailored Design Method*. Wiley, second edition.

Dillman, D., and Bowker, D. (2001). "The Web questionnaire challenge to survey methodologists. " In U. D. Reips and M. Bosnjak (Eds.). *Dimensions of internet science*. Pabst Science Publishers, Lengerich, Germany.

Dosi, G., Freeman, C., Nelson, R., Silverberg, G., and Soete, L. (1988). *Technical change and economic theory*. Printer Publishers Limited, UK.

Doty, D. and Glick, W. (1998). Common methods bias: does common methods variance really bias results?. *Organizational Research Methods*, 1, 374-406.

Dow, K., Hackbarth, G., and Wong, J. (2006). Enhancing customer value through IT investment: a NEBIC perspective. *Database for Advances in Information Systems*, 37(2/3), 167-175.

du Rausas, M., Manyika, J., Hazan, E., Bughin, J., Chui, M., and Said, R. (2011). Internet Matters: the Net's Sweeping Impact on Growth, Jobs, and Prosperity. Retrieved October 12, 2011, from http://www.mckinsey.com/mgi/publications/internet _matters/pdfs/MGI_internet_matters_full_report.pdf

Dubinsky, A. (1980). A factor analytic study of the personal selling process. *Journal of Personal Selling & Sales Management*, 1, 26-36.

Duhan, S., Levy, M., and Powell, P. (2001). Information systems strategies in knowledge-based SMEs: the role of core competencies. *European Journal of Information Systems*, 10, 25-40.

eBay. (2009). Becoming a PowerSeller. Retrieved December 3, 2009, from http://pages.ebay.ca/help/sell/sell-powersellers.html

Edwards, J. (2001). Multidimensional constructs in organizational behavior research Multidimensional constructs in organizational behavior research: an integrative analytical framework. Organizational Research Methods, 4(2), 144-192.

Eisenhardt, K., and Martin, J. (2000). Dynamic capabilities: what are they. *Strategic Management Journal*, 21, 1105-1121.

Emiliani, M. (2000). Business-to-business online auctions: key issues for purchasing process improvement. *Supply Chain Management*. 5(4).

Ende, L., and Wei, J. (2007). E-energy security model development based on value chain analysis for oil enterprises. *Int. J. Management and Enterprise Development*, 4(5), 489-501.

Eng, T., (2004). The role of e-marketplaces in supply chain management. *Industrial Marketing Management*, 33, 97– 105.

Evans, P., Camus, L., Sehgal, V., and McGowan, B. (2010). Western European online retail forecast, 2009 to 2014. *Forrester Research*. Retrieved October 13, 2011, from http://www.forrester.com/rb/research

Ferguson, C., and Yen, D. (2007). Using the CATE model to help SMEs expand to global e-commerce markets. *International Journal of Management and Enterprise Development*, 4(1), 96-117.

Field, A. (2005). *Discovering Statistics Using SPSS*. Sage, London, 2nd edition.

Fischer, E. and Reuber, R. (2011). *Building International Sales in a Digitized Economy - Best Practices for SMEs*. The Conference Board of Canada, Ottawa, Canada.

Fletcher, R., Bell, J., and McNaughton, R. (2004). *International e-business marketing*. Thomson, UK.

Fornell, C. and Larker, D. (1981). Evaluating structural equation models with unobservable variables and measurement algebra and statistics. *Journal of Marketing Research*, 18(3), 382-388.

Freeze, R. and Raschke, R. (2007). An assessment of formative and reflective constructs in is research. *Proceedings of the 15th European Conference on Information Systems*. St. Gallen. Switzerland. June 7-9, 1481-1492.

Garver, M. and Mentzer, T. (1999). Logistics research methods: employing structural equation modeling to test for construct validity. *Journal of Business Logistics*, 20(1), 33–57.

Gefen, D., Straub, D., and Boudreau, M. (2000). Structural equation modeling and regression: guidelines for research practice. *Communications of AIS*, 7(7), 1-78.

Golovko, E. and Valentini, G. (2011) Exploring the complementarity between innovation and export for SMEs' growth. *Journal of International Business Studies*, 42, 362-380.

Gorrell, G., Ford, N., Madden, A., Holdridge, P., and Eaglestone, B. (2011). Countering method bias in questionnaire-based user studies. *Journal of Documentation*, 67(3), 507-524.

Grewal, R., Comer, J., and Mehta, R. (2001). An investigation into the antecedents of organizational participation in business-to-business electronic markets. *Journal of Marketing;* 65(3), 17-33.

Guilford, J. and Fruchter, B. *(1973). Fundamental statistics in psychology and education. (5th ed.).* New York: McGraw-Hill.

Guthrie, R., and Austin, L. (1996). Competitive Implications of The Internet. *Information Systems Management*, 13(3), 90-103.

Hair, J., Anderson, R., Babin, B., and Black, W. (2010). *Multivariate data analysis: a global perspective. (7th ed.).* New Jersey: Pearson - Prentice Hall.

Hair, J., Bush, R., and Ortinau, D. (2000) *Marketing Research: a practical approach for a new millennium*. Singapore: McGraw-Hill.

Hamermesh, R., Marshall, P., and Pirmohamed, T. (2002). Note on business models analysis for the entrepreneur. *Harvard Business School Teaching Note No. 9-802-048*. Retrieved January 22, 2008, from: http://doi.contentdirections.com/mr/hbsp.jsp?doi=10.1225/802048

Hardesty, D., and Bearden, W. (2004). The use of expert judges in scale development implications for improving face validity of measures of unobservable constructs. *Journal of Business Research*, 57, 98-107.

Harman, H. (1967). *Modern factor analysis*. Chicago: University of Chicago Press.

Hayton, J., Allen, D., and Scarpello, V. (2004). Factor retention decisions in exploratory factor analysis: a tutorial on parallel analysis. *Organizational Research Methods*, 7(2), 91-205.

Hedman, J., and Kalling, T. (2003). The business model concept: theoretical underpinnings and empirical illustrations. *European Journal of Information Systems*, 12, 49-59.

Hinkin, T. (1995). A review of scale development practices in the study of organizations. *Journal of Management*, 21(5), 967-988.

Hox and Bechger (1998) An Introduction to Structural Equation Modeling. *Family Science Review*, 11, 354-373

Industry Canada. (2009). Canadian Company Capabilities (CCC). Retrieved February 13, 2009, from http://www.ic.gc.ca/

Industry Canada (2011). Key Small Business Statistics. Ottawa, ON. Retrieved September 09, 2010, from www.ic.gc.ca/sbstatistics

Jackson, B. (2010). Mapping data important for online realtor services. Retrieved December 23, 2010, from www.itbusiness.ca/it/client/en/home/ news.asp?id=58368

Jeffrey, S. and Hodge, R. (2007). Factors influencing impulse buying during an online purchase. *Electronic Commerce Research*,7, 367-379.

Jelassi, T., and Leenen, S. (2003). An E-Commerce Sales Model for Manufacturing Companies: A Conceptual Framework and a European Example. *European Management Journal*, 21(1), 38–47.

Jimenez-Zarco, A., Martínez-Ruiz, M., Barba-Sánchez, V., and Izquierdo-Yusta, A. (2011). "ICT Use in Universities: An Educational Model for Digital Natives". In Bak, O., and Stair, N. (Eds.) *Impact of E-business Technologies on Public and Private Organizations: Industry Comparisons and Perspectives* (pp. 20-34). Business Science Reference (an imprint of IGI Global), Hershey, PA, USA.

Johns, R. (2011). "Technology, Trust and B2B Relationships: A Banking Perspective". In Bak, O., and Stair, N. (Eds.) *Impact of E-business Technologies on Public and Private Organizations: Industry Comparisons and Perspectives* (pp. 79-96). Business Science Reference (an imprint of IGI Global), Hershey, PA, USA.

John-Huggins, R. (2007). Examining barriers to business e-commerce. *Innovation Analysis Bulletin,* 9(1), 16-17.

Kaiser, H. (1974). An index of factorial simplicity. *Psychometrika*, 39(1), 31-36.

Kalapesi, C., Willersdorf, S., and Zwillenberg, P. (2010). The *Connected Kingdom: How the Internet is Transforming the UK Economy*. The Boston Consulting Group, Boston, MA, USA

Kim, J., and Mueller, C. (1978). *Introduction to Factor Analysis*. Beverly Hills: Sage Publications.

King, D., Lee, J., Warkentin, M., and Chung, H. (2002). *Electronic Commerce: A Managerial Perspective*. Prentice Hall, New Jersey.

Kioses, E., Pramatari, K., and Doukidis, G. (2006). Factors affecting perceived impact of electronic marketplaces. *19th Bled e-Conference e-Values*. Bled, Slovenia, June 5-7, 16 Pages.

Kling, R. (1980). Social analyses of computing: theoretical perspectives in recent empirical research. *ACM Computing Surveys*. 12(1), 61-110.

Knight, G., and Cavusgil, T. (1996). The born global firm: a challenge to traditional internationalization theory. *Advances in International Marketing,* 8, 11-26.

Kobrin, S. (2001). Territoriality and the governance of cyberspace. *Journal of International Business Studies*, 32(4), 687-704.

Kohli, A., Jaworski, B., and Kumar, A. (1993). Markor: A measure of market orientation. *Journal of Marketing Research*, 30(4), 467-477.

Koufteros, X., Babbar, S., and Kaighobadi, M. (2009). A paradigm for examining second-order factor models employing structural equation modeling. *International Journal of Production Economics*, 20, 633-652.

Koufteros, X., and Marcoulides, G. (2006) Product development practices and performance: A structural equation modeling-based multi-group analysis. *Int. J. Production Economics*, 103, 286-307.

Kreamer, K., King, J., Dunkle, D., and Lane, J. (1989). *Managing information systems: changes and control in organizational computing*. Jossey-Bass, San Francisco, CA.

Krosnick, J. A. (1999). Survey research. *Annual Review of Psychology*, 50, 537-567.

Lambert, D., and Harrington, T. (1990). Measuring nonresponse bias in customer service mail surveys. *Journal of Business Logistics*, 11(2), 5-25.

Laugesen, J., and Yuan, Y. (2010). What factors contributed to the success of Apple's iPhone. *2010 Ninth International Conference on Mobile Business / 2010 Ninth Global Mobility Roundtable*, 91-99.

Lawson, B., and Samson, D. (2001). Developing innovation capability in organizations: a dynamic capabilities approach. *International Journal of Innovation Management*, 5(3), 377-400.

Lee, I. (2005). Office depot's e-commerce evaluation. *International Journal of Cases on Electronic Commerce*, 1(2), 44-53.

Lenox, M., and King, A. (2004). Prospects for developing absorptive capacity through internal information provision. *Strategic Management Journal*, 25, 331-345.

Levenburg, N., and Magal, S. (2005). Applying importance-performance analysis to evaluating e-business strategies among small firms. *E-service Journal*, 29-48.

Levene, H. (1960), "Robust Tests for Equality of Variances". In Olkin, I. (Ed.) *Contributions to Probability and Statistics* (pp. 278-292). Stanford University, CA, USA.

Loane, S., McNaughton, R., and Bell, J. (2004). The internationalization of internet-enabled entrepreneurial firms: evidence from Europe and North America. *Canadian Journal of Administrative Sciences*, 21(1), 79-96.

Loane, S., Bell, J., and Deans, K. (2007). Internet adoption by rapidly internationalizing SMEs: a further challenge to staged e-adoption models. *International Journal of Entrepreneurship and Small Business*, 4(3), 277-290.

Lusch, R., and Vargo, S. (2006). *The Service-Dominant Logic of Marketing: Dialog, Debate, and Directions*. Armonk, NY, USA.

Malhotra, N. (1996). *Marketing Research: An Applied Orientation*. Prentice-Hall, Englewood Cliffs, NJ, USA.

Marr, A., and Yan, L. (2011). "ICTs and Social Inclusion: The Case of Microfinance in Developing Countries". In Bak, O., and Stair, N. (Eds.) *Impact of E-business Technologies on Public and Private Organizations: Industry Comparisons and Perspectives* (pp. 114-124). Business Science Reference (an imprint of IGI Global), Hershey, PA, USA.

Martin, M. (1994). *Managing Innovation and Entrepreneurship in Technology-based Companies*. John Wiley & Sons, NY, USA.

McNaughton, R. (2001). A typology of website objectives in high technology business market. *Marketing Inelegance & Planning*, 19(2), 82-87.

McNaughton, R. and Bell, J. (2001). Competing from the periphery: export development through hard business network programs. *Irish Marketing Review,* 14(1), 43-54.

Menon, A., Bharadwaj, S., Adidam, P., and Edison, S. (1999). Antecedents and consequences of marketing strategy making: A model and a test. *Journal of Marketing,* 63(2), 18-40.

Neslin, S., Grewal, D., and Leghorn, R. (2006). Challenges and Opportunities in Multichannel Customer Management. *Journal of Service Research: JSR*, 9(2), 95-112.

Netemeyer, R., Beardon, W., and Sharma, S. (2003). *Scaling Procedures: Issues and Applications*. Sage, Thousand Oaks, CA.

Nunnally, J. (1978). *Psychometric Theory*. McGraw-Hill Book Company, Toronto.

OECD. (2001). *The internet and business performance*. Mons, Belgium.

OECD. (2010). OECD Key ICT Indicators. Retrieved October 12, 2011, from http://www.oecd.org/document/23/0,3746,en_2649_34449_33987543_1_1_1_1,00.html

Oviatt, B., and McDougall, P. (1994). Toward a theory of international new ventures. *Journal of International Business Studies*, 25(1), 45-64.

Parker, C., and Castleman, T. (2009). Small Firm E-business Adoption: A Critical Analysis of Theory. *Journal of Enterprise Information Management,* 22(1/2), 167-182

PASW (2007). *PASW Missing Value Analysis 18.0.* SPSS Inc, Chicago, IL, USA.

Patrakosol, B., and Lee, S. (2009). IT capabilities, interfirm performance, and the state of economic development. *Industrial Management & Data Systems*, 109(9), 1231-1247.

Pitis, O., and Vlosky, R. (2000). Wood-products exporters ease their way onto the Internet. *Wood Technology,* 127(2), 28-31.

Podsakoff, P., MacKenzie, S., Lee, J., and Podsakoff, N. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology,* 88(5), 879-903.

Podsakoff, P., MacKenzie, S., Moorman, R., and Fetter, R. (1990). Transformational leader behaviors and their effects on followers' trust in leader, satisfaction, and organizational citizenship behaviors. *Leadership Quarterly*, 1(2), 107-142.

Podsakoff, P., and Organ, D. (1986). Self-reports in organizational research: problems and prospects. *Journal of Management*, 12(2), 531-544.

Porter, M. (1979). How competitive forces shape strategy. *Harvard Business Review*, March-April, 137-145.

Porter, M. (2001). Strategy and the internet. *Harvard Business Review*. March, 63-78.

Porter, M. (2008). The Five Competitive Forces That Shape Strategy. *Harvard Business Review*, January, 24-41.

Priem, R., and Butler, J. (2001). Is the resource-based theory a useful perspective for strategic management research? *Academy of Management Review*, 26(1), 22-40.

Rask, M., and Kragh, H. (2004). Motives for e-marketplace participation: differences and similarities between buyers and suppliers. *Electronic Markets*, 14(4), 270-283.

Ray, A., and Ray, J. (2006). Strategic benefits to SMEs from third party web services: an action research analysis. *The Journal of Strategic Information Systems*, 15(4), 273-91.

Rayport, J., and Jaworski, B. (2004). *Introduction To E-commerce.* McGraw Hill, New York.

Richman, D., Wacker, D., Asmus, J., Casey, S., and Andelman, M. (1999). Further analysis of problem behavior in response class hierarchies. *Journal of Applied Behavior Analysis*, 32(3), 269-283.

Rogelberg, S. and Stanton, J. (2007). Understanding and dealing with organizational survey nonresponse. *Organizational Research Methods*, 10(2), 195-209.

Rogers, E. (2003). *Diffusion of Innovations.* Free Press, NY, USA.

Saeed, K. Grover, V. and Hwang, Y. (2005). The relationship of e-commerce competence to customer value and firm performance: an empirical investigation. *Journal of Management Information Systems*, 22(1), 223-256.

Sambamurthy, V., Bharadwaj, A., and Grover, V. (2003). Shaping agility through digital options: reconceptualizing the role of Information Technology in contemporary firms. *MIS Quarterly*, 27(2), 237-263.

Sashi, C., O'Leary, B. (2002). The role of Internet auctions in the expansion of B2B markets. *Industrial Marketing Management*, 31, 103– 110.

Sawhney, M., and Zabin, J. (2001). *The seven steps to NIRVANA*. McGraw-Hill, New York.

Schilling, M. (2008). *Strategic Management of Technology and Innovation.* Boston: McGraw-Hill.

Schlosser, F. and McNaughton, R. (2007). Individual-level antecedents to market-oriented actions. *Journal of Business Research,* 60, 438-446.

Schon, D. (1967). *Technology and Change.* Dell publishing Co., NY.

Schon, D. (1973). *Beyond the Stable State.* Norton library, NY.

Schumacker, R. and Lomax, R. (2004). *A Beginner's Guide to Structural Equation Modeling*. Lawrence Erlbaum Associates, Mahwah, NJ.

SECT. (2007). Survey of Electronic Commerce and Technology. Retrieved September 5, 2008, from http://www.statcan.ca/cgi-bin/imdb/p2SV.pl?Function=getSurvey&SDDS=4225&lang=en&db=IMDB&dbg=f&adm=8&dis=2

Segars, A. (1997). Assessing the unidimensionality of measurement: a paradigm and illustration within the context of information systems research. *Omega*, 25(1), 107-121.

Seidler, J. (1974). On using informants: a technique for collecting quantitative data and controlling measurement error in organization analysis. *American Sociological Review*, 39(6), 816-831.

Sheppard, M. (2010). *Antecedents of High-Growth and Gazelle Enterprises an Empirical Study*. Ph. D. thesis. University of Waterloo. Faculty of Engineering.

Singh, R. (1998). *Entrepreneurial Opportunity Recognition Through Social Networks*. Ph. D. dissertation. University of Illinois at Chicago.

Slater, D. (2000). The integrated enterprise: the whole… is more than its parts. *CIO*. Framingham, 13(15), 116-120

Smart, A., and Harrison, A. (2003). Online reverse auction and their role in buyer-supplier relationships. *Journal of Purchasing and Supply Management*, 9, 257-268.

Smith, A., and Correa, J. (2005) Value-added benefits of technology: e-procurement and e-commerce related to the health care industry. *International Journal of Health Care Quality Assurance,* 18(6/7), 458-473.

Soliman, K., and Janz, B. (2004). An exploratory study to identify the critical success factors affecting the decision to establish Internet-based interorganizational Information Systems. *Information & Management,* 41(6), 967-706.

Song, M., Calantone, R., and Benedetto, C. (2002). Competitive forces and strategic choice decisions: an experimental investigation in the United States and Japan. Strategic Management Journal, 23(10), 969–978.

Soto-Acosta, P. and Merono-Cerdan, A. (2008). Analyzing e-business value creation from a resource-based perspective. *International Journal of Information Management*, 28, 49-60.

Spector, P. (2006). Method variance in organizational research: truth or urban legend? *Organizational Research Methods*, 9, 221-232.

Stair, G. (2011). "Enterprise Risk Management: A Case Study in the Pharmaceutical Industry". In Bak, O., and Stair, N. (Eds.) *Impact of E-business Technologies on Public and Private Organizations: Industry Comparisons and Perspectives* (pp. 125-142). Business Science Reference (an imprint of IGI Global), Hershey, PA, USA.

Standing, C. and Benson, S. (2000). An effective framework for evaluating policy and infrastructure issues for e-commerce. *Information Infrastructure and Policy*, 6, 227-236.

Standing, S., Standing, C., and Love, P. (2010). A review of research on e-marketplaces 1997-2008. *Decision Support Systems*, 49(1), 41-51.

Statistics Canada. (2006). Electronic commerce and technology. Retrieved February 13, 2008, from http://www.statcan.ca/daily/english/070420/d070420b.htm

Statistics Canada. (2007). Enterprises that sell goods/services over the internet. Retrieved February 13, 2008, from http://www40.statcan.ca/l01/cst01/econ146e.htm

Strauss, A. and Corbin, J. (1990). *Basics of Qualitative Research*. Sage Publications, California.

Stennes, B., Stonestreet, C., Wilson, B., and Wang, B. (2006). E-technology adoption by value added wood processors in British Columbia. *Forest Products Journal*, 56(5), 24-28.

Stockdale, R., and Standing, C. (2002). A framework for the selection of electronic marketplaces: a content analysis approach. *Internet Research*, 12(3), 221-234.

Straub, D. (2003). Foundations of Net-Enhanced Organizations: Chapter 7. Competitive NE Strategy. Retrieved April 10, 2008, from http://www.cis.gsu.edu/~dstraub/Courses/AIT%202004/Ch07.ppt

Stump, R, and Heide, J. (1996). Controlling supplier opportunism in industrial relationships. *Journal of Marketing Research*, 33(1), 431-441.

Suchman, L. and Bishop, L. (2000). Problematizing 'Innovation' as a Critical Project. *Technology Analysis & Strategic Management*, 12(3), 327-333.

Tabachnick, B. and Fidell, L. (2007). *Using Multivariate Statistics*. Pearson Education, Boston, MA.

Tarafdar, M. and Gordon, S. (2007). Understanding the influence of information systems competencies on process innovation: a resource-based view. *Journal of Strategic Information Systems*, 16, 353-392.

Teece, D., Pisano, G., and Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509-533.

Teece, D., Pisano, G., and Boerner, C. (2002). "Dynamic capabilities, competence, and the behavioral theory of the firm", in Augier, M., & March, J. (Eds). *The economic of choice, change and organization: essay in honor of Richard Cyert*, Edward Elgar, Aldershot.

Tether, B. (2002). Who co-operate for information, and why an empirical analysis. Research *Policy*, 31, 947-967.

Tetteh, E., and Burn, J. (2001). Global strategies for SME-business: applying the SMALL framework. *Logistics Information Management*, 14(1/2), 171-180.

Thompson, B. (2004). *Exploratory and Confirmatory Factor Analysis: Understanding Concepts and Applications*. American Psychological Association, Washington, DC.

Todorovic, B. McNaughton, R. and Guild, P. (2005). Making university departments more entrepreneurial: the perspective from within. *International Journal of Entrepreneurship and Innovation*, 6(2), 115-124.

Trites, G., Boritz, E., and Pugsley, D. (2006). E-business: A Canadian Perspective for a Networked World. Pearson Prentice Hall, Toronto.

Tucker, T. (2011). *Supply Chain Orientation Refining a Nascent Construct*. Ph. D. thesis. University of Waterloo. Faculty of Engineering.

Uhrbach, M., and Tol, B. (2004). Information and communication technology use: are small firms catching up. Retrieved February 10, 2008, from http://www.statcan.ca/english/research/11-621-MIE/2004009/issue.htm

Utterback, J. (1982). "Innovation in industry and the diffusion of technology", in Tushman, M & Moore, W. (Eds). *Readings in the management of innovation*. Boston: Pitman.

Van De Ven, A. (1986). Central problems in the management of innovation. *Management Science*, 32(5), 590-607.

Venkatraman, N. (1994). IT-enabled business transformation: from automation to business scope redefinition. *Sloan Management Review*, 35(2), 73-87.

Vlosky, R. (1999). E-business in the forest products industry. *Forest Products Journal*, 49(10), 12-21.

Wade, M. and Hulland, J. (2004). The resource-based view and information systems research: review, extension and suggestions for future research. *MIS Quarterly*, 28(1), 107-138.

Wang, C., and Ahmed, P. (2007). Dynamic capabilities: a review and research agenda. *International Journal of Management Reviewers*, 9(1), 31-51.

Wernerfelt, B. (1984). The resource-based view of the firm. *Strategic Management Journal*, 5(2), 171–180.

Wheeler, B. (2002). NEBIC: A dynamic capabilities theory for assessing Net-enablement. *Information Systems Research*, 13(2), 125-146.

Wheeler, B. (2005). Nokia NEBIC and IT Governance Program: Net-enabled Business Innovation Cycle (NEBIC). Retrieved April 10, 2008, from http://bwheeler.ovpit.iu.edu/wheeler_plone/Nokia2005/Net-enabled_Business_Innovation_Cycle.ppt

Widaman, K. (1985). Hierarchically nested covariance structure models for multitrait- multimethod data. *Applied Psychological Measurement*, 9(1), 1-26.

Wigand, R. (1997). Electronic Commerce: Definition, Theory, and Context. *The Information Society*, 13, 1-16.

Williams, M. (2004). *Organizational routines for choosing Information Technology: a multiple case study examination of NEBIC theory's choosing capability*. Ph. D. dissertation. Indiana University, School of Business.

Windrum, P., and Berranger, P. (2003). Factors affecting the adoption of intranets and extranets by SMEs: a UK study. Retrieved August 13, 2007, from http://www.ribm.mmu.ac.uk/wps/papers/03-10.pdf

Worthington, R., and Whittaker, T. (2006). Scale development research: a content analysis and recommendations for best practices. *The Counseling Psychologist*, 34(6), 806-838.

Wu, F., Mahajan, V., and Balasubramanian, S. (2003). An analysis of e-business adoption and its impact on business performance. *Journal of the Academy of Marketing Science,* 31(4), 425-447.

Wu, J. and Hisa, T. (2008). Developing e-business dynamic capabilities: an analysis of e-commerce innovation from I-, M-, to U-commerce. *Journal of Organizational Computing and Electronic Commerce,* 18, 95-111.

Yap, C., Soh, C. and Raman, K. (1992). Information systems success factors in small business. *OMEGA Int. J. of Mgmt. Sci.,*20(5/6), 597-609.

Yi, L. (2011). "E-Business/ICT and Carbon Emissions". In Bak, O., and Stair, N. (Eds.) *Impact of E-business Technologies on Public and Private Organizations: Industry Comparisons and Perspectives* (pp. 214-232). Business Science Reference (an imprint of IGI Global), Hershey, PA, USA.

Yockey, R. (2007). *SPSS Demystified: A Step-by-Step Guide to Successful Data Analysis*. Pearson Education, NJ, USA

Yoo, Y., Henfridsson, O., and Lyytinen, K. (2010). The new organizing logic of digital innovation: an agenda for information systems research. *Information Systems Research*, 21(4), 724-735.

Zahra, S., and George, G. (2002a). The Net-enabled business innovation cycle and the evolution of dynamic capabilities. *Information Systems Research,* 13(2), 147-150.

Zahra, S., and George, G. (2002b). Absorptive capacity: a review, reconceptualization, and extension. *Academy of Management Review,* 27(2), 185-203.

Zahra, S., Sapienza, H., and Davidsson, P. (2006). Entrepreneurship and dynamic capabilities: a review, model and research agenda. *Journal of Management Studies*, 43(4), 917-955.

Zank, G,. and Vokurka, R. (2003) The internet: motivations, deterrents, and impact on supply chain relationships. *S.A.M. Advanced Management Journal*, 68(2), 33-40.

Zhao, Y., Cavusgil, S. (2006). The effect of supplier's market orientation on manufacturer's trust. *Industrial Marketing Management*, 35, 405-414.

Zhu, K., and Kraemer, K. (2002). E-commerce metrics for net-enhanced organizations: assessing the value of e-commerce to firm performance in the manufacturing sector. *Information Systems Research,* 13(3), 275-295.

Zhang, M., and Lado, A. (2001). Information systems and competitive advantage: a competency based view. *Technovation,* 21, 147-156.

Zimmaro, D. (2003) Test item analysis and decision making. Retrieved May 09, 2011, from http://ctl.utexas.edu/assets/Evaluation--Assessment/Test-Item-Analysis-and-Decision-Making-8-25-03.pdf