

The Influence of Risks on the Performance of E-Business

تأثير المخاطر على أداء منشآت الأعمال الإلكترونية

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Abstract

The between research goal of this study was to ascertain the between e-Business risk factors that considerably influence the performance of e-Business organization negatively. This goal was achieved by gathering empirical data and applying several statistical tests.

The data were collected via an online questionnaire. Followed by a descriptive analysis and a Kendall's Test was done to analyze the similarities among the different groups. A One-Way ANOVA analysis was conducted to determine the significance of the difference of e-Business risk between groups. A total of six hypotheses with 49 risk factors were posited and tested. Followed by a factorial analysis that consists of extracting 10 components from the initial exhaustive list of risk factors and comes up with innovative classes of e-Business. These classes were named 'Experience and Knowledge', 'Technology and Security', and 'Strategy, Governance and Management'.

This research relates to the shortage of agreed e-Business risk construct and their association with different e-Business modules that constitutes the key components of e-Business core activities and processes. The six e-Business modules framework proposed in this research with its risk construct were a contribution that search for addressing these insufficiencies. The practitioner could get an insight from this study to help prioritize the e-Business risk and assign a correct probability of occurrence as well as the significance of the risk impact.

The e-Business risk construct framework with its six e-business modules used in this research present a limitation in the context that not all e-Business firm or practitioners necessarily get involved with the six e-Business modules, which might influence the respondent perception and risk rating. Some other limitations are the risk that a respondent might give inaccurate answers because of impatience and the quite small sample size. Finally, conducting a qualitative research with the same proposed e-Business framework is an informative study and might provide more in-depth analyses as a potential further research.

Keywords: E-Business risks, E-Commerce risks, CRM risks, BI risks, ERP risks, SCM risks, E-Collaboration risks

ملخص

إن الهدف من هذه الدراسة هو التأكد وتحديد عوامل المخاطر المتعلقة بالأعمال الإلكترونية التي تؤثر بشكل سلبي على أداء المؤسسة ذات الأعمال الإلكترونية. وقد تحقق هذا الهدف من خلال جمع البيانات التجريبية وتطبيق العديد من الاختبارات الإحصائية.

تم جمع البيانات من خلال استبيان عبر الإنترنت. ومن ثم تم تحليل وصفي للبيانات و كذلك تم اختبار "كيندال" و "One-Way ANOVA" لتحليل أوجه التشابه بين مختلف المجموعات. تم طرح واختبار مجموع ست فرضيات متعلقة بـ 49 عامل للمخاطر المتعلقة بالأعمال الإلكترونية. ثم تم استخدام اختبار تحليل العوامل لاستخراج 10 عناصر من القائمة الحصرية الأولية من عوامل المخاطر وتم استنباط فئات مبتكرة للأعمال الإلكترونية. تم تسمية هذه الفئات بـ 'الخبرة والمعرفة'، 'التكنولوجيا والأمن'، و 'الاستراتيجية والإدارة والتنظيم'.

و يتعلق هذا البحث بالنقص في النظريات والمفاهيم المتفقة بالمخاطر المتعلقة بالأعمال الإلكترونية وارتباطها مع مختلف الوحدات التي تشكل العناصر الأساسية للأنشطة والعمليات الأساسية للأعمال الإلكترونية. في هذه الدراسة تم اقتراح ستة وحدات للأعمال الإلكترونية مع المخاطر المتعلقة بها كمساهمة لهذه الدراسة لمعالجة هذه النواقص.

يمكن للممارس ان يحصل على افكار من هذه الدراسة التي ستساعد في ترتيب أولوية مخاطر الأعمال الإلكترونية وتحديد احتمال الحدوث و أهمية تأثيرات المخاطر المترتبة. أخيراً، يمكن إجراء دراسة نوعية باستعمال الستة وحدات للأعمال الإلكترونية مع المخاطر المتعلقة بها كإطار مبدئي مقترح للأعمال الإلكترونية، لتكون دراسة جد مفيدة ويمكن أن توفر المزيد من التحليل المتعمق.

Dedication

I dedicate this dissertation

To my mother and soul of my father who whatever I will do, I will never compensate them.

To my beloved wife and children for their continuous support and help during my studies.

To my family for their patience when I was busy with the dissertation.

To Professor Abdel Halim Boussabaine, the supervisor of this work, for his advice and ultimate helps and support.

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Thank you all

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CHAPTER 1

INTRODUCTION

1.1 Introduction

These days, Internet penetrated almost every home and business, and it becomes an everyday life's word. It has global influence and reliability, and supports all type of applications and services. Web content, instant messenger, electronic emails, e-commerce sites, and online libraries are a new type of services offered by the Internet that enables people to communicate, retrieve and exchange information worldwide or even buy and sell goods. Nowadays, almost all business' transactions are performed and completed successfully via the Internet, either in the business realm or customer market. More and more, companies are impressively benefiting and taking advantage of being present on the Web since an increasing number of people are using the net as the researching, inquiring and collaborating tools to buy and sell services and products.

The total number of persons using the Internet to shop across the world has climbed sharply from 10% to 85% in only two years according to a survey from Nielsen Online (www.alphr.com). In 2016, the total Internet users reach approximately 3.43 billion with 46.1% as the global internet penetration. This number is increasing at a faster rate as shown in figure 1.1.

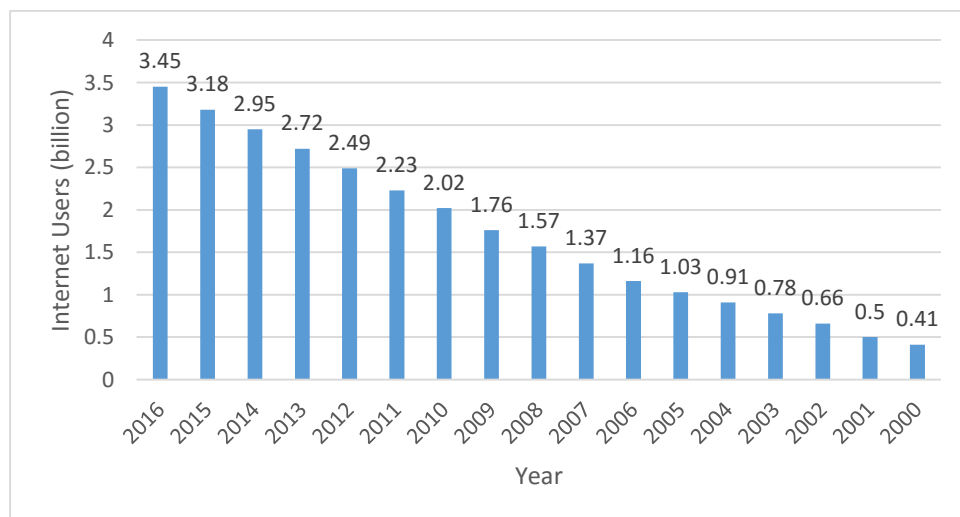


FIGURE 1.1: INTERNET USERS IN THE WORLD

(www.internetlivestats.com)

All these growths might be instigated by the transactions' easiness and quickness that improve the Internet user efficiency and effectiveness versus the traditional way. However, even with all these benefits and attractions, e-Business is alarmed by numerous threats and risks, for instance, illegal usage of private information, confidentiality of personal data, the authenticity of the user, insecure communication, bandwidth unavailability, e-Payment fraud, Weakness in the relationship with the customers, etc. Nowadays, business is becoming more and more competitive and aggressive in a point that obligate companies to identify, assesses, and mitigate any risk that might threaten or lead to damage the firm's performance (Hussain et al. 2011).

Furthermore, risk management could be seen as a process that handles uncertainty associated with a risk, and in an e-business environment it is an appropriate procedure to find, evaluates, control, reduce and remove the negative influence of several risk factors associated to multiple e-Business' areas such as business intelligence, customer relationship management, supply chain management, enterprise resources planning, e-commerce, and e-collaboration. As well, the decreasing of the risk's likelihood is one of the principal goals of risk management. There is a lot of risk classification in e-Business done previously by several studies such as technology-related risks, people, processes, business strategy, operational, legal, criminals, and commercial environment risks (Kim et al. 2015; Scott 2004; Srinivasan & Abi-raad 2003; Wan et al. 2014). In this research, the key goal is to figure the presence of several kinds of risk factors in e-Business realm to control those risks effectively.

1.2 Aims and Objectives of the Study

Even though numerous researches have been addressing some of the e-Business risk factors (Grant et al. 2014; Kim et al. 2015; Scott 2004; Srinivasan & Abi-raad 2003; Wan et al. 2014), academic works has yet to explore the topic of risk factors that are related to e-Business module like Business Intelligence risk factors, Customer Relationship Management risk factors, Supply Chain Management risk factors, Enterprise Resources Planning risk factors, E-commerce risk factors, and e-Collaboration risk factors that drive an e-Business' company to survive and increase its performance. The purpose of this study is to instigate, explore, and evaluate several e-Business risk factors that possibly will influence and threaten e-business firm' performance. The following will consistently address the key purposes of the study, which are:

- What are the most important e-Business risk factors that influence the e-Business performance negatively?
- To determine if there are differences of perceptions of e-Business risk factors in e-Business realm among the e-Business practitioners.
- Determining what e-Business risk factors are most likely to arise within the six e-Business modules.
- Based on the risk's rating, ranking, and components groupings of the risk factors, a new classification will be established to support and guide practitioners considering the e-Business risk factors.

1.3 Methodology Outline

In this section, an outline of the research methodology is given. The study reports an analysis of a survey of e-Business practitioners to determine their opinions about the impact and evaluation of the e-Business risks factors. Several activities were part of the research method. The early one consists of the literature reviews on the e-Business components to improve the understanding of the risk factors that may affect an e-Business Enterprise and its performance. As a result, a selection of 49 e-Business risk factors was chosen from an exhaustive list after a refining process, informal discussion and risk factors' fusion, renaming and removal procedure. The list of risk was grouped and mapped to the six modules that consist of e-Business and was included in the questionnaire. The survey respondents were asked to rate the negative influence of e-Business risk factors on the performance of the e-Business. The distribution of the questionnaire was done by e-mail and by the diffusion of the link on social media sites, especially LinkedIn. The Internet made easy the access to several regions worldwide, for instance, North America, Europe, Asia, and MENA region.

A total of 77 valid respondents out of 366 that opened the link completed all the questionnaire, which brings the rate of the responses at 21%. The data collected was coded and imported to IBM Statistics SPSS and MS Excel to be analyzed for the research. Finally, the findings of the research, the research's implications, contributions, and recommendations were deliberated in the last chapter.

1.4 Outline Chapters

Chapter 1 - “Introduction” - Provides an introduction, aims and objectives of the study. Also, the importance of the study was justified through a theoretical literature review.

Chapter 2 – “Literature Review” - In this chapter, an overview and definition of E-business were highlighted, then the six e-Business modules were introduced from the literature reviews as part 1. Next, an effort was taken to extract the universal e-Business risk factors in different categorization and classification like Business Strategy, Information Technology, Financial & Commercial Environment, and Legal, Operational, Security, and People & Organizational risks as part 2. Those risk factors were associated with the six e-Business module establishing a new e-Business risk framework proposed for the study.

Chapter 3 – “Research Methodology” - The research methodology and process for the study were emphasized. Also, the method for the questionnaire designing and development for the survey was explained.

Chapter 4 – “Descriptive Analysis” - This chapter highlighted the data collection phase and a reliability test was performed. Moreover, a descriptive analysis of the responses was completed using the IBM Statistics SPSS and Microsoft Excel.

Chapter 5 – “Analysis of Variance - ANOVA” - In this chapter, the statistical method of analysis of variance well known as ANOVA was performed.

Chapter 6 – “Factors Analysis of e-Business’ Risk” – The factor analysis was conducted via the Principal Component Analysis statistical test in SPSS.

Chapter 7 – “Discussions and Conclusions” – Finally, the results of the research was discussed and concluded by research's implications, contributions, and recommendations.

1.5 Summary

Finally, the study helps a better understanding of the risk factors surrounding the e-Business modules such as Business Intelligence, Customer Relationship Management, Supply Chain Management, Enterprise Resources Planning, e-Commerce and e-Collaboration, and stress the importance of a subset risk factors that need to be identified, planned, monitor and well managed in order to prevent the negative impact and the threat that might destroy and damage the e-Business functionality.

2.1 Background and Description of Online Business

Nowadays, a majority of people are familiar with the Internet; Internet invaded people's home, and it becomes present anywhere (homes, business, academic, entertainment, etc...). For several years, e-commerce and e-business developed a great reputation and popularity in the business sphere. As technology advances, many new applications have been developed and an increase in the complexity of e-transaction. These days, via the Web practically all business action can be finished, starting from online shopping ending to the SCM (supply chain management) either in customer marketplace or enterprise realm.

Traditional companies develop their business websites in a way that could offer online transactions. Pure online firms which operate only through the Web are increasing, and business corporations are collaborating via information systems. With considerably greater performance than in the past, the economy is jumping into the Internet era (Business Week, 2003).

The Internet lets companies bypass physical restrictions. Moreover, it lets them attend bigger audiences more efficiently. Besides, and with an easy way, it lets firms focus on particular consumer groups, which might be very hard and costly to reach a specific customer segment in "**brick-and-mortar**" marketplaces (Kim et al. 2004). Moreover, the marketing process through internet let the customer be active since it is an interactive and collaborating medium which differ from the traditional one-way communication from dealer to the customer (Yelkur & DaCosta 2001). The next section in this chapter will provide an overview of e-business.

2.2 Overview and Definition of E-Business

Electronic business (popular as e-business) is also known as internet-based business. It is the availability over the net of commercial or organizational operations and the collaboration of information (Lee et al. 2007). In the same way, (Hossain & Wigand 2004) defined e-business as the use of the web technologies to support the sales activities of products and services, as well as cooperation with customers. Corey & Wilson (2009) state that the crucial objective of e-business is to build an online presence for a business enterprise and to deliver great interactivity and functionality.

Srivastava et al. (2013) explain that all business actions and procedures were supported and reinforced by information and communication technologies (ICT). To support external business' activities and relations with consumers the E-business emphasizes on the use of ICT. Enterprises through e-Business procedures allow internal and external data-processing systems to link with great efficiency and flexibility, which helps better serving the customers' needs. The relationships between e-Business and the customer are improving through web-based technology.

Hossain & Wigand (2004) highlight that e-business is not an alternative word for e-commerce. Even in many cases, they are often used interchangeably; e-business is more general including e-commerce as a specific model, which is related with information and communication technologies supporting commercial transactions (Corey & Wilson 2009). Wright (2002) confirms that there is a distinction between e-business and e-commerce. The first focused on customer's value growth by using the web technologies and the internet to produce efficient methods and operations. The second, e-commerce, is externally focused and mainly based on online selling stuff like Amazon.com for instance.

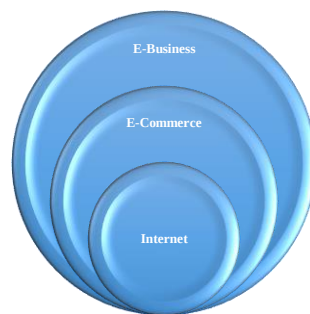


FIGURE 2.1: E-BUSINESS AND E-COMMERCE

The meaning and boundaries of e-business and e-commerce create a deliberation between professionals and scholars. Some claim that e-business includes the whole world of electronically based actions whether it is internally or externally, as well as e-commerce as shown in Figure 2.1 (Kalakota & Robinson 2003). Others argue, conversely, that e-commerce comprehends the total world of e-based activities that sustain an organization's buying and selling goods—comprising whole information system's structure of an organization (Rayport & Jaworski 2002).

Also, e-business and e-commerce get a universal term called e-environment that includes them both. In this study, we define e-business as the use of the web-based technologies to support the commercial or organizational operations, as well as the collaboration of information. Moreover, we will adopt the e-Business framework of (Terri & William 2003) with eight e-Business modules, but we choose a small adaptation to it by considering only six e-Business modules named Business Intelligence, Customer Relationship Management, Supply Chain Management, Enterprise Resources Planning, e-Commerce, and e-Collaboration.

2.3 E-Business Modules

In 1997, IBM initiated the concept and model of e-business. Gartner Group (1999) refined this concept and defined as "the optimization of a firm's business activities through digital technology." Frost & Strauss (2001) have extended the definition by including five modules (i.e. BI business intelligence, CRM customer relationship management, SCM supply chain management, ERP enterprise resource planning, and EC e-Commerce), Terri & William (2003) expanded it by three new modules which are collaboration, making electronic transfer within the firm, and online activities between businesses. In our study, the last three modules added by Terri & William (2003) are forming one module named e-Collaboration as shown in Figure 2.2.

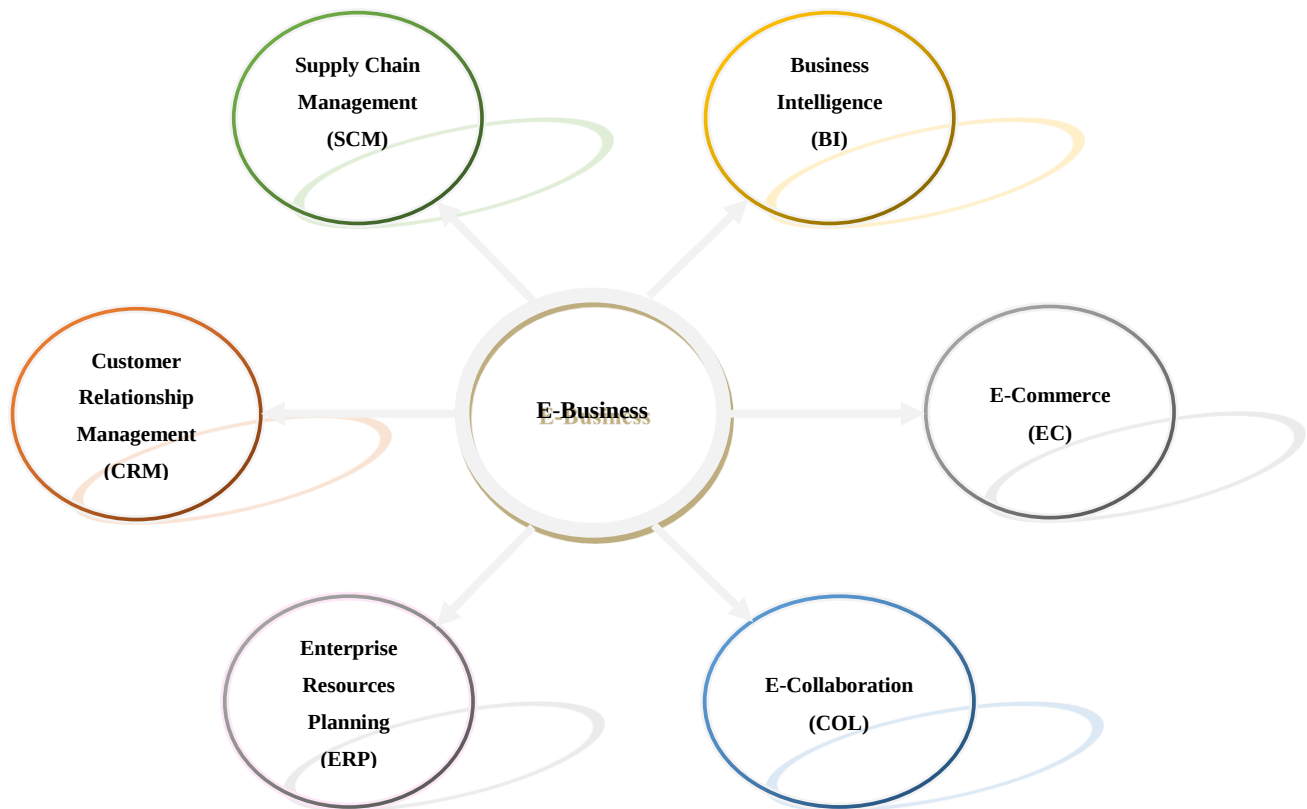


FIGURE 2.2: MODULES OF E-BUSINESS (ADAPTED FROM TERRI & WILLIAM 2003)

2.3.1 Business Intelligence (BI)

Business Intelligence (BI) is defined as the actions that a corporate may undertake to gather, store, access, and analyze data related to its market which will be very helpful to the management of competent decision making as shown in Figure 2.3. BI let track the profitability of customers, the achievement of the critical milestone, and the optimum time for launching marketing or promotion campaign. It will help firms' pinpoint important trends and take great choices quicker once implemented online. Consequently, practitioners labelled BI as "the crystal ball of the 21st century." (West 2006).

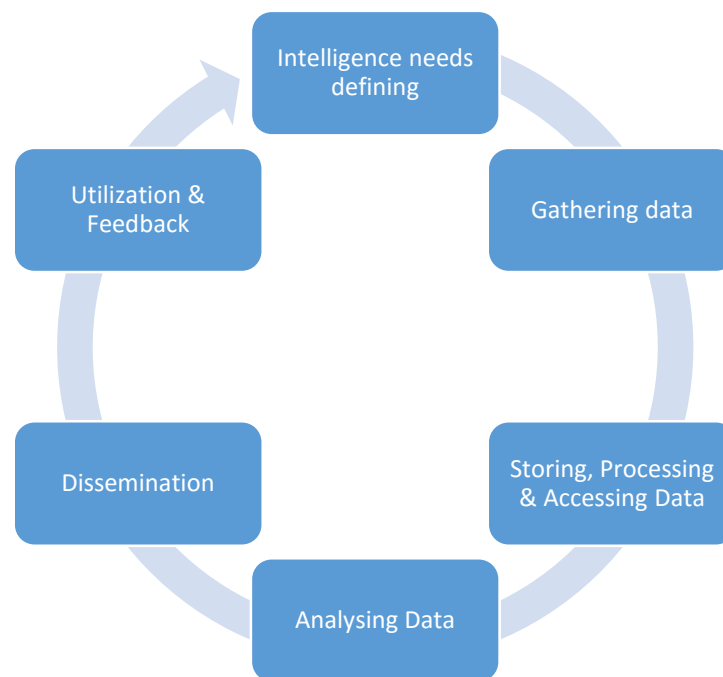


FIGURE 2.3: MAIN PHASES OF A TYPICAL BI PROCESS (ADAPTED FROM SALONEN 2005 CITED IN SANGAR & IAHAD 2013)

With the right capabilities, Business Intelligence could aid a business predict ups and downs in product demand by using the right capabilities (Wixom & Watson 2010). The BI's capabilities include querying and reporting data, between analysis, forecast, data mining, etc. (Turban et al. 2008). Moreover, several benefits of Business Intelligence are shown in figure 2.4 which help the business to perform in an efficient and a competitive manner.

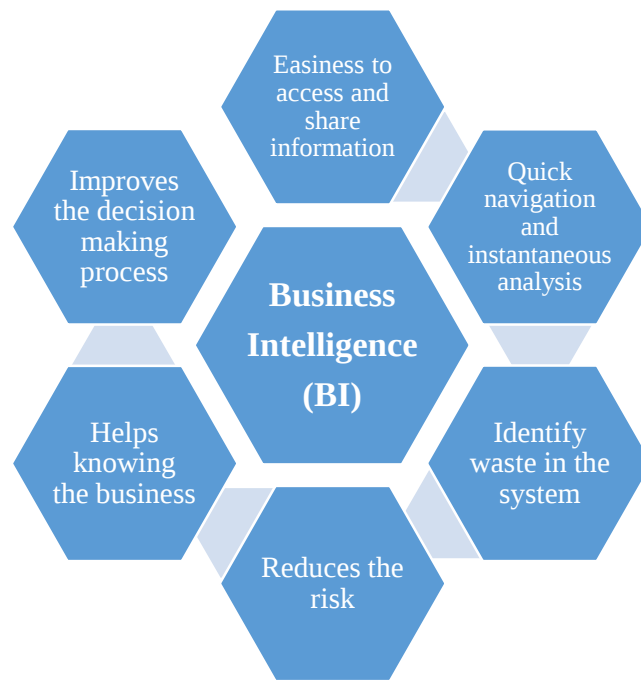


FIGURE 2.4: BUSINESS INTELLIGENCE (BI) BENEFITS FOR THE BUSINESS

2.3.2 Customer Relationship Management (CRM)

Turban et al. (2008) define Customer Relationship Management (CRM) as "...a customer service approach that focuses on building long-term and sustainable customer relationships that adds value to the customer and the company." Also, Payne & Frow (2006) used a more specific definition as the following:

Customer relationship management (CRM) is a strategic approach that is concerned with improving shareholder value through development of appropriate relationships with critical customers and customer segments so that profitable and long-term relationships can be built.

In the same context, The CRM objective is to raise profitability and decrease costs as long as it keeps and enhances customer happiness. CRM is a corporate-wide plan which aims to give one whole view of every single customer in a defined time by taking along together information from all data sources (cestinationCRM.com 2010)

By adopting CRM, Companies can benefit from multiple aspects such as; innovation and novelty, value improvement, enhanced service, and better efficiency. Customer relationship management has multiple objectives that might need to be reached such as generating value and realizing greater profitability for the customer, and increasing his loyalty and retention, delivering customize and advanced quality services and products, and offering optimizes process (Kim et al. 2003).

Winer (2001) claims that CRM needs seven stages for its implementation as Figure 2.5 displays. First of all, the creation of a store (DB) that contains all customer action such as businesses transactions, personal information, contacts, and marketing reaction. Next, explore the database to delineate customer segments. Thirdly, target customers are defined. In the fourth stage, CRM uses a selection of marketing tools to target the carefully chosen customers. Another stage that has to be considered during the entire customer relationship management process is the privacy and confidentiality issues of the customers. In the next stage, the relationship programs are established such as reward, loyalty and customer service programs, customization, and community organization. As a final stage, CRM process success has to be measured by implementing metrics and performing the evaluation. CRM's metrics could be categorized in four areas: cost,

quality, time, and service's performance. For instance time area might include total duration from order to delivery (Strauss & Raymond 2016).

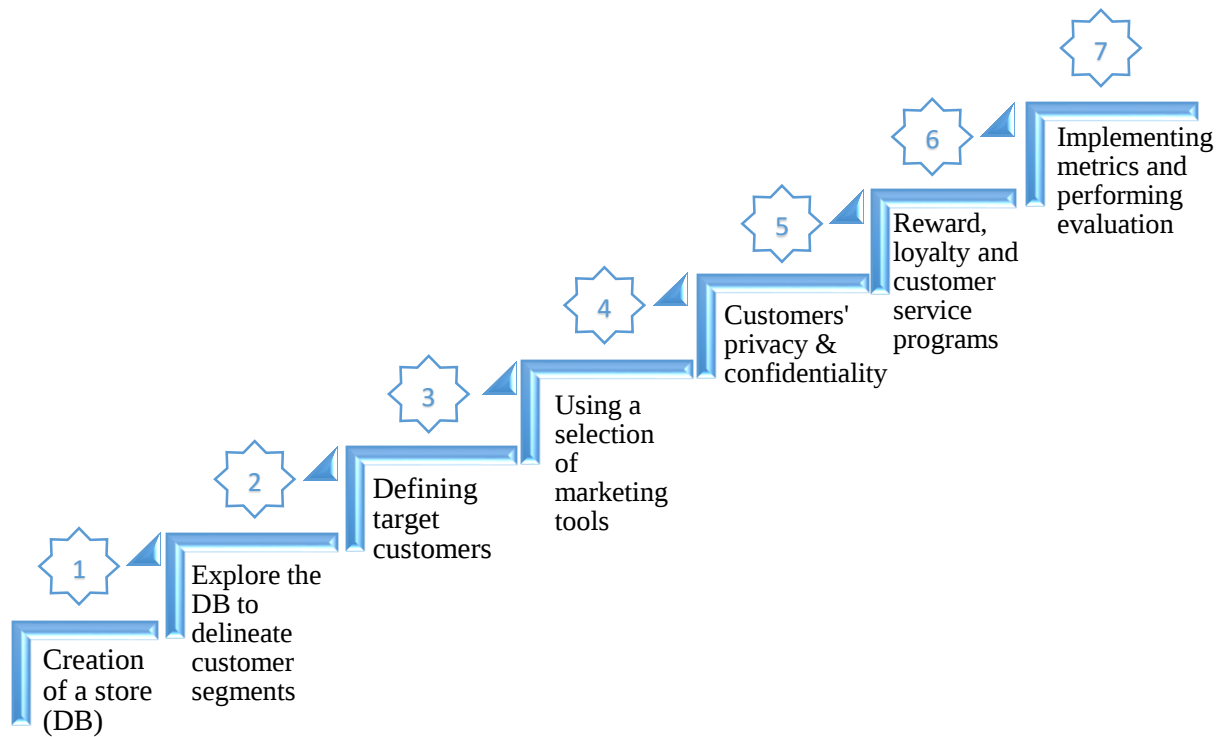


FIGURE 2.5: SEVEN STAGES FOR CRM'S IMPLEMENTATION

2.3.3 Supply Chain Management (SCM)

Supply Chain Management (SCM) is involved in managing the network of vendors and suppliers that provide the raw materials required in delivering different services or making products that are necessary for every organization. So, to a business to be able to deliver end-products to customers, a company needs to improve effectively and efficiently how to find different raw materials (Wailgum 2007). According to Goutsos & Karacapilidis (2004) Information and communication technologies (ICT) play a prevalent role in the SC of an organization, as almost all associated activities result in creating, sharing and using information. Moreover, the powers to accelerate opportunities for interrelationships are made easy by the increasing sophistication of these technologies. Either, being suppliers or customers, companies are obliged to establish safe, rapid and uninterrupted relations with their business partners by considering both the current marketplace and business alterations.

Supply chain activities were divided into three parts as shown in Figure 2.6: First part, process and in management inside a single function within the company called intra-functional coordination. The second part named as inter-functional coordination, which takes place between several between of a company.

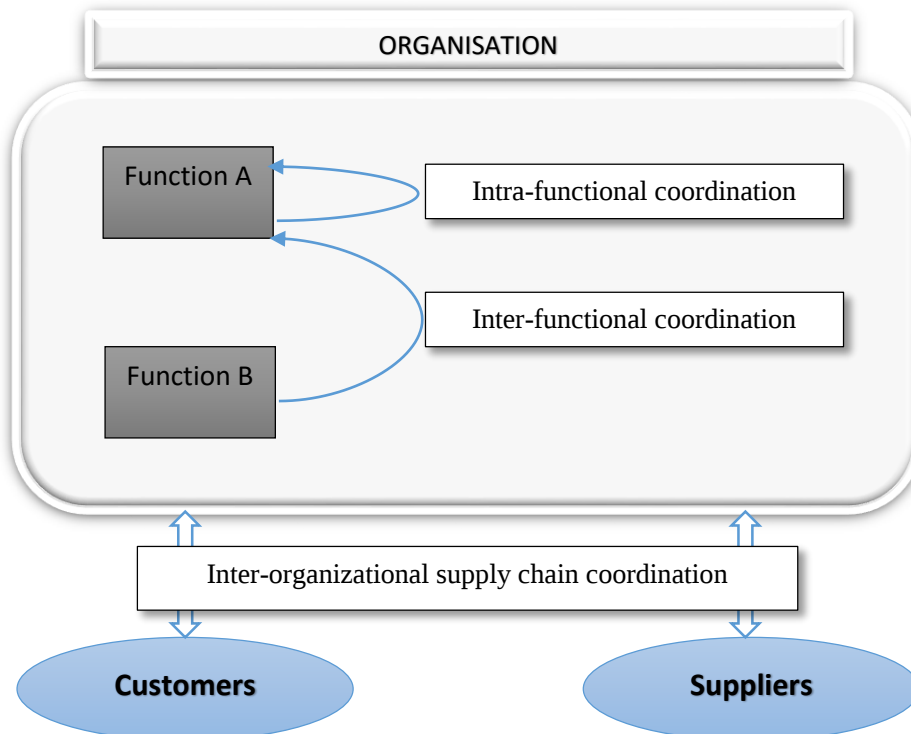


FIGURE 2.6: THREE TYPES OF SCM'S ACTIVITIES

The third part involved the coordination between multiple customers and suppliers termed as inter-organizational supply chain coordination. This view reflects the model of e-market, through up and down connections that span organizations boundaries, which prolongs the interactions from internal function to external in belonging to different organizations (Ballou et al. 2000).

Also, Hong (2002) highlight the importance of inter-organizational information systems (IOS) within supply chain management and its quick development over last four decades which let information technology to switch from a powerful competitive advantage to a collaboration enabler. The Internet has developed IOS capability and hence is being embraced as a default platform for information systems development within SCM (Williamson et al. 2004). Furthermore, supply chain management (SCM) has gained extensive application using Internet protocols as standards particularly in B2B e-market (Eng 2004).

Additional, the emphasis of information distribution is to enable cohesively and synchronized decision making in SC. The open flow of the whole important information across the supply chain will lead to a complete analysis that enables an optimization of SCM principal decisions. Figure 2.7 displays the summary of how e-Business technologies in SC facilitate the flowing of information (Vakharia 2002).

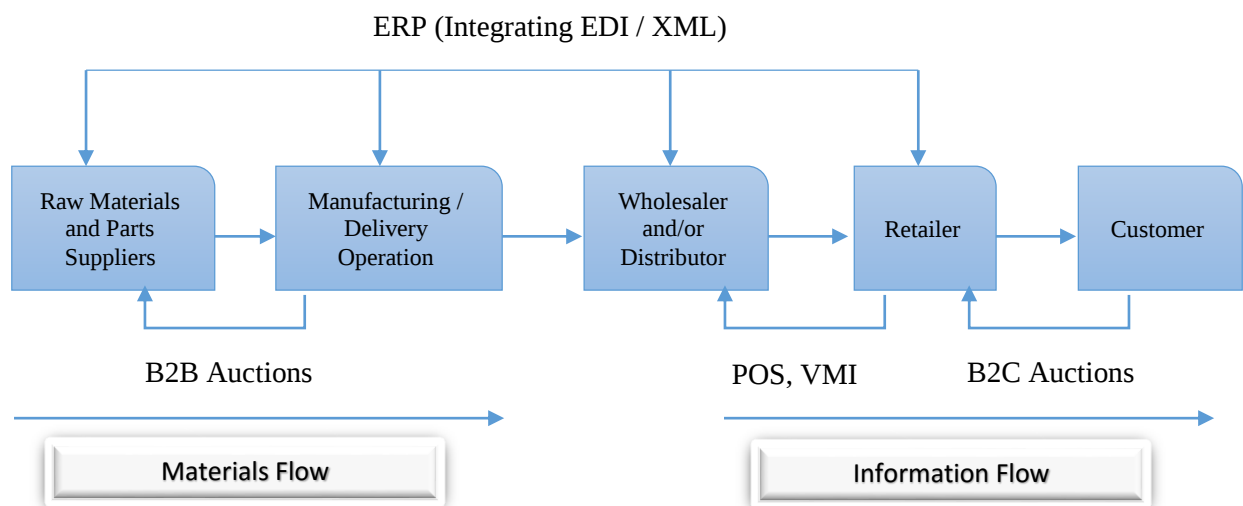


FIGURE 2.7: INFORMATION FLOWS USING E-BUSINESS TECHNOLOGIES IN A SUPPLY CHAINS

(Vakharia 2002)

2.3.4 Enterprise Resource Planning (ERP)

Enterprise Resource Planning (ERP) is serving specific requirements of each section through a single system application which incorporate all sections crossways the enterprise like HR, IT, Accounting & Financial, manufacturing, and sales/marketing department, etc. The main goal of ERP is to deliver information fast and efficient to sections or individuals who need it (Foley 2007). Increasingly well-known business companies understand that coalitions with their close partners, customers, and suppliers via the net are mandatory. In fact, the integration between e-business and ERP systems turn out to be a very critical concern (Ash & Burn 2003). Figure 2.8 shows how Enterprise Resource Planning fits with e-Business components.

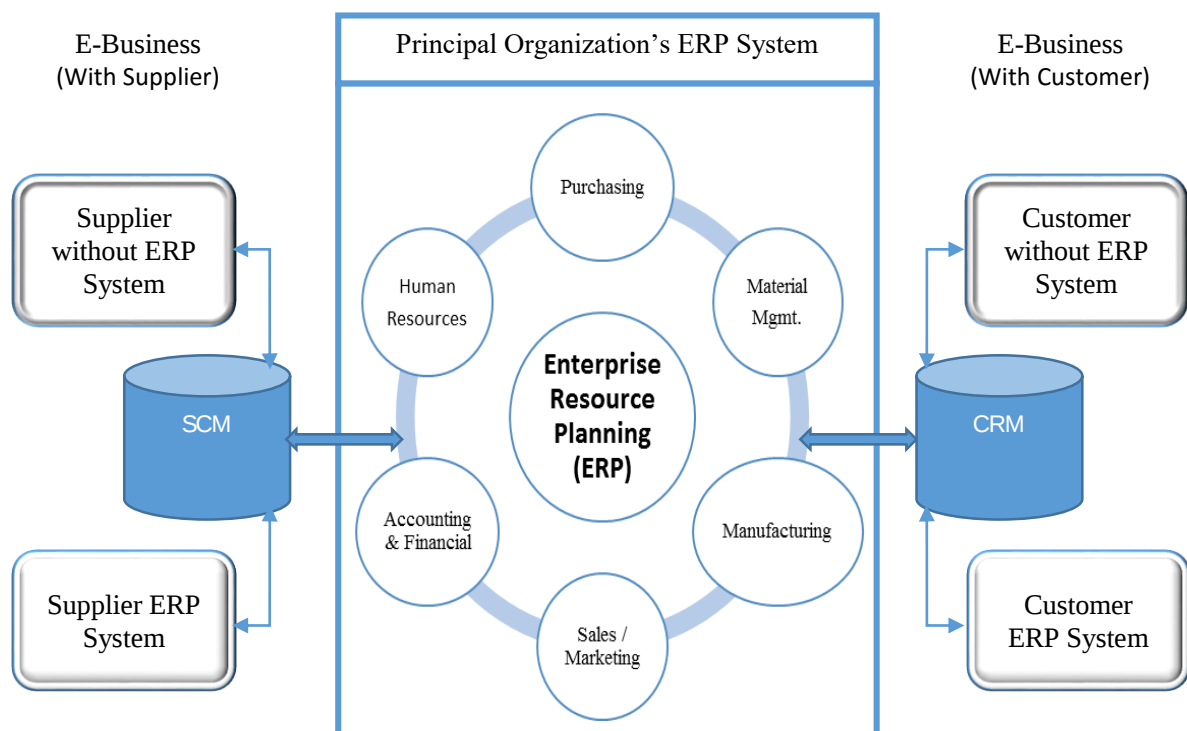


FIGURE 2.8: ORGANIZATION'S ERP SYSTEM FITTING WITH E-BUSINESS

(Adapted from Hsu 2013)

Additionally, ERP is known as an arranged and planned method to enhance in-house firm's value chain. The ERP software based on logical communication and data sharing could connect different modules of the organization, especially when realized totally across the whole organization (Norris et al. 2000). To support business decision-making, companies can use the data assembled for analysis and the data altered to valuable information by ERP systems, when

the wholly integrated information through the value chain requested by suppliers and customers or when cohesive strategies and tactics in fields as engineering, stock, supplying and financial required by executives. By implementing successful ERP systems, companies are allowed to focus on value-added, and core accomplishments and business processes are improved and remodeled to remove non-value activities (Kumar & Thapliyal 2010).

2.3.5 E-Commerce

2.4.6.1 E-Commerce Definition

There are quite a lot of definitions of e-Commerce as there are numerous researches which are completed in this regards. One of the best definition stated by Delone & Mclean (2004) that e-commerce “is defined as the use of the Internet to facilitate, execute, and process business transactions. Business transactions involve a buyer and seller and the exchange of goods or services for money”. We also refer to definition by Schneider and Perry (2000) cited in (Grandon & Pearson 2004) who also stress that the internet is the medium to conduct business transactions. Nevertheless, Cain Evans (2015) clarify that e-commerce is not only trading on the web as known, but essentially only a part of the change in how commerce is benefiting from the Web. Figure 2.9 shows the whole mechanism and business transaction in e-Commerce.

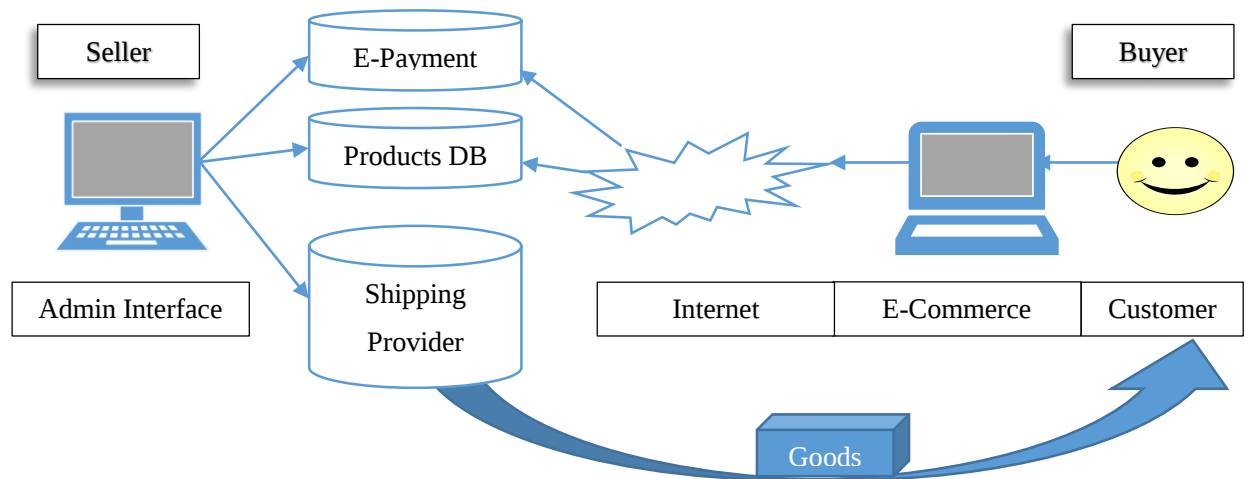


FIGURE 2.9: THE WHOLE MECHANISM AND BUSINESS TRANSACTION IN E-COMMERCE

Also, Laudon & Traver (2011, p.92) established a detailed definition of the e-commerce based on their research as "E-commerce involves digitally enabled commercial transactions between and among organizations and individuals. Digitally enabled transactions to include all those mediated by digital technology, meaning, for the most part, transactions that occur over the Internet and the Web. Commercial transactions involve the exchange of value (e.g. money) across organizational or individual boundaries in return for products or services". The processes of engaging an order to monitor delivery represent the transaction in the e-commerce.

The next definition explains the boundaries between e-business and e-commerce, Awad (2005) states that E-business becomes e-commerce at the instant that an exchange of value arises. Businesses choosing to trade their goods and services through the Internet will have e-commerce as their revenue generator. By putting their faith in the Internet, some small firms are emerging.

Moreover, several small companies also pay attention to e-commerce for their particular business requirements, for instance, office stuff, laptops, and other technology devices, or other business-related merchandises. Of course, because of the ubiquity of the Internet of all transactions' forms and sizes, it is not unexpected phenomena (Small Business Management 2016).

2.4.6.2 E-Commerce technology's features uniqueness

There are several features in e-commerce technology that both challenge traditional business thinking and explain why we have so much interest in e-commerce.

A. *Ubiquity*

Before business was represented by a physical place where customer needs to visit to conduct his commercial transactions. For instance, TV and radio usually via advertisement persuade the consumer to buy goods and services by going to the physical marketplace. Contrarily, e-commerce is characterized by its availability at all times and everywhere, what we called ubiquity. Shopping for your laptops, mobile phone, from office or home was made possible by e-commerce, and the restriction to a physical location was no longer needed. The transaction cost in the traditional market was reduced by e-commerce ubiquity as seen from a consumer perspective. It is not anymore required that you expend time and cash traveling to a physical market to finish a commercial transaction. It seems that ubiquity of e-commerce drops the mental effort necessary to handle a commercial transaction in a market space.

It is suitable, for a human being to choose the minimum required effort, this is in general what human look for to decrease mental effort expenditures (Shapiro & Varian 1999; Tversky & Kahneman 1981).

B. Global Reach

E-commerce allows money-making transactions across different countries much more efficiently and with low cost than traditional trading. As a result, by 2015, the worldwide Internet audiences keep growing fast, with the size of the world's online users around 3 billion (www.plunkettresearch.com). By calculating the reach of an e-commerce firm, the total number of customers could be obtained (Evans & Wurster 1997).

Contrarily, most "brick-and-mortar" business is local or regional—it implicates local dealers with physical outlets. Media stations, for example, are mainly local and regional organizations with restricted domestic networks, but it is very influential to interest a countrywide audience. In the opposite of e-commerce technology, these traditional business technologies do not cross borders to a worldwide audience.

C. Universal Standards

The technical standards for the Internet and for conducting e-commerce are an amazing and uncommon feature which is universal standards; worldwide shared and accepted. In the other hand, from country to another one there is a difference in "brick-and-mortar" business technology mostly. For example, Mobile, TV and radio standards change the world. The market entry costs are made very low by the universal technical standards of the Internet and e-commerce since the dealers need to transport only the merchandises to the marketplace. Simultaneously, consumers need fewer efforts to get suitable goods for a reason to e-commerce universal standards feature. And the prices and goods descriptions finding turn out to be accessible, precise, and more rapidly with a low cost in a single and common worldwide marketpace (Bakos 1997 cited in Kim et al. 2004). Also, online users get benefits from network effects (network externalities) which get increased since everybody uses similar technology (Liebowitz & Margolis 1994).

D. Richness

Information richness designates the message's content, and difficulty (Evans & Wurster 1999 cited in Kim et al. 2004). "brick-and-mortar" markets were capable of delivering personal and aggressive frontal service and support via visual and oral clues when making a sale, which gives them a great richness. It makes them an influential and persuasive selling or a powerful commercial environment. Earlier to the Internet expansion, there was a compromise among reach and richness: the fewer the audience reached, the big rich the message.

E. Interactivity

Not like any traditional commercial technologies, e-commerce technologies facilitate the communication between both business and consumer in two directions; it enables a great interactivity. For example, TV cannot enter into any dialogue with its viewers or ask them to fill a form of information.

Contrarily, throughout websites, e-commerce allows several ways of interaction with his users. Online interactivity lets business to get users engaged with frontal experience and on a huge scale (Kim & LaRose 2004).

F. Personalization/Customization

E-commerce's dealers can aim their advertising messages to explicit peoples by tuning the message with an individual's name, interests, and previous buying. The new technology as well offers a multitude of customization, based on previous preferences or actions of the customer the goods or services are altered accordingly. At the instant of the purchase, a lot of customer's information are collected due to the interactive and cooperative environment of e-commerce (Wu et al. 2003).

2.3.6 E-Collaboration

As stated before, this module is the combination of the three modules (named 1- Collaboration 2- Online activities between businesses 3- Conducting electronic transactions within a firm) that Terri & William (2003) added to the framework of e-Business modules, we believe that it is more appropriate to present them as one module, termed e-Collaboration, since they are overlapping deeply.

2.4.6.3 Collaboration Concept

Collaboration frequently gets involved industry partners whether internal or external; the main objective is to assist them connect with each other in an efficient way, decrease businesses' travelling cost, proper projects management and shared resources (Blackwell 2008). According to Wiengarten et al. (2013), collaboration might be theorized as an element of integration. The last can be defined as the procedure of interaction and collaboration across departments, which results in unified and organized company (Kahn & Mentzer 1996). In the same way, integration is seen as a chain of connections, collaborative compartment, or both (Stank et al. 2000). Figure 2.10 displays the e-Collaboration in an e-Business environment.

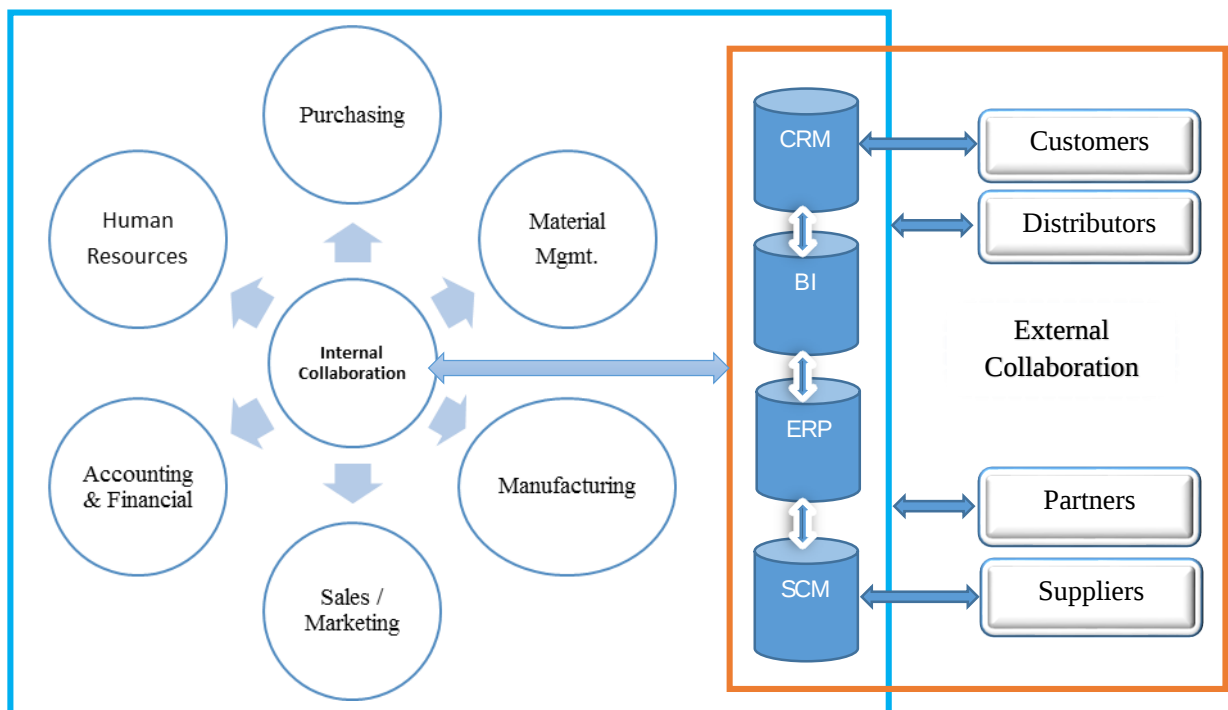


FIGURE 2.10: INTERNAL AND EXTERNAL E-COLLABORATION IN E-BUSINESS ENVIRONMENT

Others see collaboration as a concept that relates individuals and departments internally and among businesses externally (Wiengarten et al. 2013). Also, Simatupang & Sridharan (2005) suggested further dimensions characterize collaboration in the supply chain perspective. The study indicates that collaboration is more complex and involves not only the communication mechanisms across organizations and the share of information but more.

Nyaga et al. (2010) theorized collaboration throughout cooperative actions such as mutual connection efforts, the share of information, and committed investments. Mutual connection efforts can be defined as collaborative working structures about set goals, prepare plans, resolve problems and measure performance while committed investments were those devoted to a particular supply chain association.

2.4.6.4 Internal collaboration

Inside organization e-transactions and communications are conducted throughout electronic mails (e-mail), chat (instant messages) and by using the intranet. E-mail allows bigger electronic collaboration and communication across individuals; it is seen as a vital component of communication (Gupta et al. 2000). Moreover, e-mail's properties such as minor cost, quick transmission, and simplicity of use reduce and minimize communication problems.

In addition, Wikipedia.org (2016) defined intranet as:

An intranet is a private network accessible only to an organization's staff. Generally a wide range of information and services from the organization's internal IT systems are available that would not be available to the public from the Internet. A company-wide intranet can constitute an important focal point of internal communication and collaboration, and provide a single starting point to access internal and external resources. In its simplest form an intranet is established with the technologies for local area networks and wide area networks.

The main objective is to reorganize the place of work and help to get a flexible exchange of information inside business corporate. Figure 2.11 shows the internal and external communication by using collaborative tools.

2.4.6.5 External collaboration

By way of extranets, e-mails, and online meetings the information is shared and communicated across businesses. Wikipedia.org (2016) defined extranet as:

*An **extranet** is a website that allows controlled access to partners, vendors and suppliers or an authorized set of customers - normally to a subset of the information accessible from an organization's intranet. An extranet is similar to a DMZ in that it provides access to needed services for authorized parties, without granting access to an organization's entire network. Historically the term was occasionally also used in the sense of two organizations sharing their internal networks over a VPN.*

Also, an extranet is a sub-part of a business' intranet which is accessible to his partners. Extranet lets companies share useful resources with partners, customers, and dispersed employees. Besides, Extranets with just an Internet connection lets parties privately and securely use collaborative tools anytime as shown in Figure 2.11.

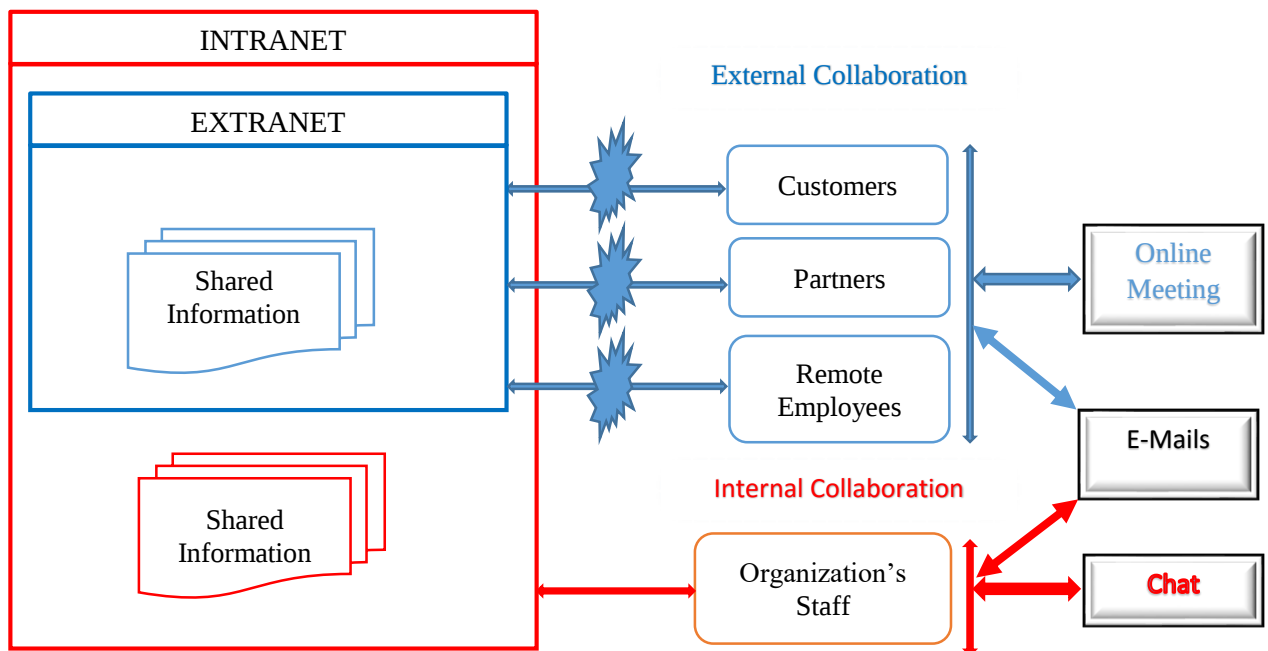


FIGURE 2.11: INTERNAL AND EXTERNAL COMMUNICATION USING COLLABORATIVE TOOLS

Further, businesses are more and more adopting extranets which encompass strategic partners to obtain and sustain the great competitive advantage, which allows those businesses to increase productivity and success (Spralls et al. 2011). Moreover, organizations are deriving the profits of advanced SC integration and synchronization of activities within the SC networks by using extranets (Frohlich 2002; Levy & Grewal 2000; Spralls et al. 2011).

2.4 Types of E-Business

There are some different types of e-Business. The well-known classification of e-Business is the one considering the transactions' nature or the participants' relationships (Turban et al. 2008). Figure 2.12 shows the major types of e-Business by the nature of the transactions.

2.4.1 Business-to-business (B2B)

One of the biggest type of e-Business, where organizations focuses on selling to other organizations (Turban et al. 2008).

2.4.2 Business-to-consumer (B2C)

The second type of e-Business in size, B2C which is the first type of e-Business used in the marketplace (Andam 2003). Here the directions of the transactions are in both way, B2C or C2B.

2.4.3 Consumer-to-consumer (C2C)

This type of E-Business, consumer to consumer, is where consumers through the internet sell their products and services to each other. For instance, eBay is the best famous consumer-to-consumer business (Turban et al. 2008).

2.4.4 Business-to-government (B2G)

The different transactions and interactions between business and government entities is another type of e-Business. Note that B2G is an important part of e-Business with transactions in both direction (Turban et al. 2008).

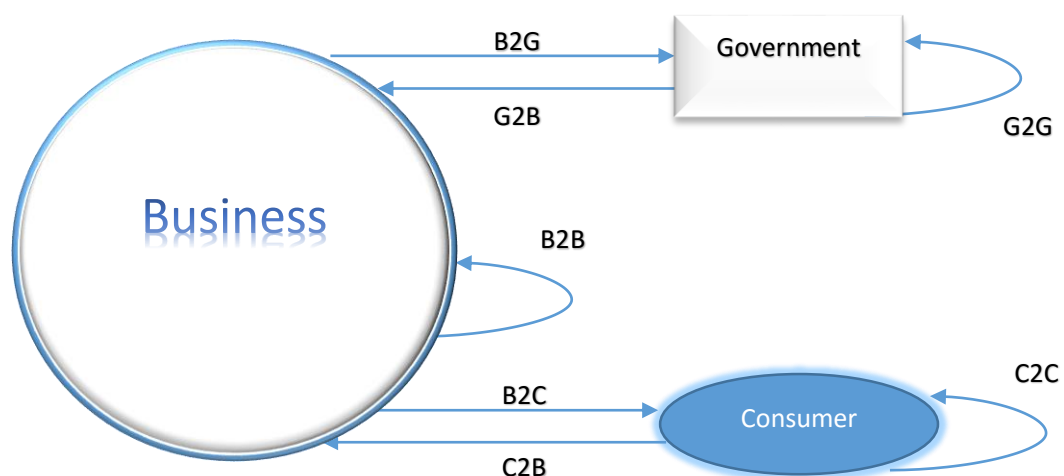


FIGURE 2.12: MAJOR TYPES OF E-BUSINESS

2.5 Introduction to e-Business Risk

Present business tendencies exhibit the growth and advance of doing business electronically (e-business) in the Business-to-Consumer or Consumer-to-Consumer Interaction archetype. It seems that some of the main factors might be in charge for this rise are the enhancement of efficiency and effectiveness of the user because of the accomplishment of activities that turn out to be easier and doesn't need a longer time, and a reduced postponements associated with traditional business techniques. Putting aside the benefits, business relations in these archetypes are concerned by several risks and threats, for example, illegal usage of private information, confidentiality of personal data, the authenticity of the user, communication's medium insecure, achieving successful results in a business association, etc. (Hussain et al. 2011).

Pfleeger (2007) believes that a risk may become a possible threat to business, its assessment fluctuates between individuals. Moreover, the risk could be categorized by the impact and type of loss discussed. For instance, the loss of personal and confidential data could be called as a privacy risk, the fear of the illicit usage of private information as a legal risk. Furthermore, operational risk, security risk, and strategic risk could be one of risk categories based on the viewpoint being taken (Hussain et al. 2011; Stevens & Timbrell 2003). In the same context, the risk categories could easily aid in the identification and assessment of risks that are not diminished or badly managed to correspond as a threat to the business. Risk classifications and identification make it easier to analyze and evaluate where so ever likely events can impact the success of e-business goals (Nastase & Nastase 2007).

In today's aggressive business realm, the objective of every company is to escape and mitigate any such losses, while at the same time realizing a great profits and revenues. (Hussain et al. 2011).

2.6 Risk' Definition and Risk Management

It is valuable to start by defining the risk, according to the Standards Australia (1999), the risk is defined as *"the chance of something happening that will have an impact on objectives. It is measured regarding consequence and likelihood"*. Intrinsically, with a small impact on the objective and a low probability of happening, therefore, a risk is measured as a low risk. Contrarily, a risk is considered as a high risk if it has a big impact on the objective and a high probability of happening (Baird et al. 2002).

Other definitions of risk are taking into consideration the impact and the probability of loss (Mitchel 1995), such objectivity is rarely reflected in real business management practice (Cousins et al. 2004; Mitchell et al. 2003; Pablo 1999). In contrast, other research suggests that risk managers need to perceive risk in the context of the significance of the outcome rather than as a number (Caldwell et al. 2013).

Numerous domains have particular ways of categorizing risks. Siropolis (1986), categorized risks into three classes: pure, fundamental, and speculative risk. The last one includes gain or loss by a business. For instance, a speculative risk could be the implementation and the development of new e-commerce website that has the possibility to procure great rewards if the e-commerce website strengthens the output efficiently and effectively. On the other hand, it could result in a loss, like to ruin business' reputation or loss of investment. During ERP implementation, several risk factors showing can be mitigated, such risk factors fit into speculative risk (Huang et al. 2004). Figure 2.13 displays the classification of risk types.

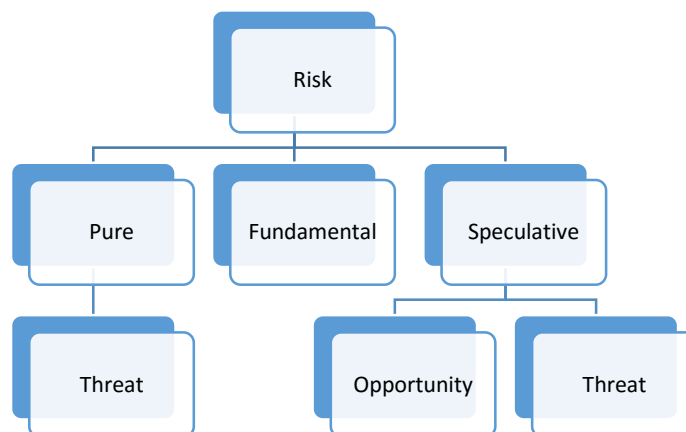


FIGURE 2.13: CLASSIFICATION OF RISK TYPES

Also, (Jorion 2009) categorized risks through another perspective such (1) unknown unknowns risks, (2) known knowns risks, and (3) known unknowns. Figure 2.14 shows the risk and uncertainty perspective.

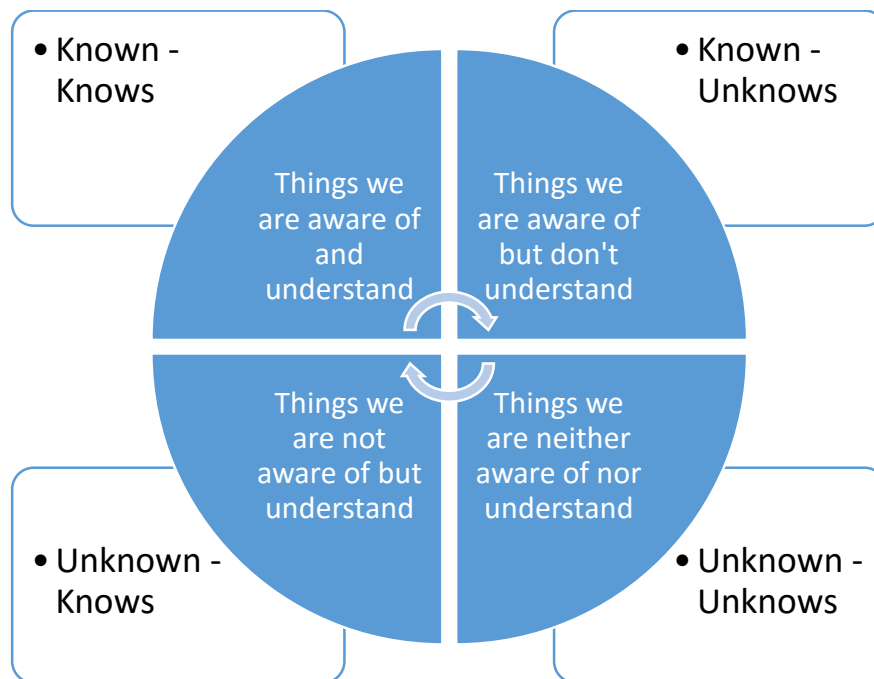


FIGURE 2.14: MATRIX OF RISK AND UNCERTAINTY

Also, we need to have a look through several definitions about risk management. First of all, Nastase & Nastase (2007, p56) defines risk management as *“the process of identifying risk, assessing risk, and taking steps to reduce risk to an acceptable level.”*

Other papers propose that the business decision-making dilemma goes through processes like identification, analysis, and mitigation of uncertainty termed as risk management definition. Moreover, risk management can be defined as handling uncertainty associated with a threat (Wu et al. 2014). Several researchers explained risk management as a suitable methodology to handle security in an e-business environment (Baird et al. 2002). Others defined it as a procedure that ought to find, remove, decrease and control risks, elude harms, and increase benefits from speculative exposures. The aim of risk management is to decrease the likelihood of upcoming losses and increase the possibility of success (Khan, & Spang 2013).

2.7 Risk in e-Business

2.7.1 Background

Nowadays, the concept of the traditional business has been changed by the quick spreading of the Internet. E-Business is risky business. The first step towards managing and minimizing the risks must be to be aware of what those risks are. Although there are various benefits of adopting and implementing of E-Business initiatives (Soliman & Youssef 2001), in the meantime the development of such initiatives rises various risks and issues. Consequently, new risks which are difficult to measure and react emerged in the online environment due to its vitality and its continuous change (Sukumar & Edgar 2009).

Also, Kim et al. (2015) point out that benefits and advantages are not the only output of applying e-business, there are some risks associated that getting rises. In other hands, Soliman & Youssef (2001) claim that using e-businesses practices improve the value and diminish the risks. Contrarily, establishments that start doing e-business activities and processes face rapid-evolving and unique risks, which lead to the conclusion that business risks for a traditional establishment are less than their online pairs (Moscou 2001). While several types of research have been led on e-commerce and e-business, a little number of studies have focused on risks associated (Daniel et al. 2002; Miller & Engemann 2000; Sukumar & Edgar 2009).

2.7.2 E-Business Risk Categorization

Upton (2001) classified risks on seven types, people, technology, business strategies and processes (external risks), and as internal risks; Legal, commercial environment, and criminals risks.

The first researches led in e-business primarily focused on strategic risks, it can be explicated by the shift from traditional business to the introduction of the online way (Kim et al. 2015). Also, Scott (2004) highlighted the importance of the strategy as following and implementing an inappropriate strategy; risks are rising. Furthermore, in addition to the strategic risks type, two more type of risks emerged within e-business era; organizational risks and e-business policy risks (Smith 2000). In the same Caldwell et al. (2013) has classified E-business risks in three primary areas: policy risks, strategy risks, and organizational risks.

Beck et al. (2002) developed a list of different types of E-Business risks, such as legal, operations, technology, security, business process, outsourcing dependency, and skilling staff

risks. In addition to the traditional risks like strategic direction, customer expectations, reputation, cultural and governance risks. Kameel (2007) adds to this three categories of risk (1) Strategic risk, (2) Operational risk, and (3) Reputational risk, two new categories of risk (4) Financial risk and (5) Human resources risk. Similarly other papers sort risks type in five categories, financial risk, physical goods risk, human resource risk, information technology risk and credit risk (Guanling & Nanping 2009).

Also, after 2000, academic's researches were focused on supply chain management risks, platform risks, the economics of e-business risks and e-business model analysis risks (Kim et al. 2015). Another classification listed three group of risks: information risks, technology risks, and business risks (Miller & Engemann 2000). Moreover, Wan et al. (2014) categorize e-business risks from three characteristics of management, information technology, and platform business risks. Also, Sukumar & Edgar (2009) elaborate a new risk framework classification with eight areas as follow: 1- Strategic risks, 2- Reputation and customer expectations risks, 3-Branding risks, 4- Security risks, 5- Legal risks, 6- Cultural risks, 7-Outsourcing and dependency risks, 8- Technology risks.

In 2014, due to the importance of big data, several studies were conducted on information technology risk which mentions the risks related to online trust (Rossi 2002) and give an attentive look to technical risks, application user risks, and business risks (Sutton et al. 2007). In Table 2.1 we elaborate all the risks categories cited by researchers.

TABLE 2.1: RISKS CATEGORIES CITED BY RESEARCHERS

Risk Category	Papers
Information Technology risks	Upton (2001), Beck et al (2002), Guanling & Nanping (2009), Miller & Engemann (2000), Wan et al. (2014), Sukumar & Edgar (2009), Rossi (2002), Nastase & Nastase (2007), Scott (2004)
Business Strategies risks	Upton (2001), Kim et al. (2015), Smith (2000), Scott (2004), Caldwell et al. (2013), Sutton et al. (2007), Beck et al (2002), Kameel (2007), Sukumar & Edgar (2009), Scott (2004)
Financial & Commercial Environment risks	Upton (2001), Kameel (2007), Guanling & Nanping (2009), Kim et al. (2015), Srinivasan & Abi-raad (2003), Scott (2004)
Legal risks	Upton (2001), Beck et al (2002), Sukumar & Edgar (2009), (O'Brien 2002), Srinivasan & Abi-raad (2003), Scott (2004)
Security risks	Upton (2001), Beck et al (2002), Sukumar & Edgar (2009), Nastase & Nastase (2007), Bhakoo & Chan (2011), Sung 2006), Scott (2004)
Operational risks	Beck et al (2002), Kameel (2007), Sawalha & Atwell (2010), Kim et al. (2015), Scott (2004)
People & Organizational risks	Upton (2001), Scott (2004), Caldwell et al. (2013)
Human Resources risks	Kameel (2007), Guanling & Nanping (2009), Beck et al (2002)
E-business Policy and Regulatory risks	Scott (2004), Caldwell et al. (2013)
Technical risks	Sutton et al. (2007)
Application-user risks	Sutton et al. (2007)
Outsourcing Dependency risks	Beck et al (2002), Sukumar & Edgar (2009)
Reputation & Customer Expectations risks	Beck et al (2002), Kameel (2007), Sukumar & Edgar (2009), Scott (2004)

Cultural risks	Beck et al (2002), Sukumar & Edgar (2009), Scott (2004)
Management and Governance risks	Beck et al (2002), Wan et al. (2014), Scott (2004)
Physical Goods risks	Guanling & Nanping (2009)
Credit risks	Guanling & Nanping (2009)
Platform risks	Kim et al. (2015), Wan et al. (2014)
e-Business Model Analysis risks	Kim et al. (2015)
Competitor risks	Scott (2004)
Processes risks	Upton (2001), Beck et al (2002)

2.7.3 Risk Associated to e-Business Modules

In this section, some risks retrieved from literature review associated with the six e-Business modules; 1-Business Intelligence, 2-Customer Relationship Management, 3-Supply Chain Management, 4-Enterprise Resource Planning, 5-e-Commerce, and 6-e-Collaboration. The total number of risks initially reached more than hundred. But, for the simplicity and practicality of the research, several risks were removed due to their small criticality or aggregated with others which have the same meaning or some overlapping. Table 2.2 shows for every e-Business module the associated risk factors and the papers where it was cited.

TABLE 2.2: RISK ASSOCIATED WITH E-BUSINESS MODULES CITED BY RESEARCHERS

E-Business Module	Risk Factor	Papers
Business Intelligence (BI)	1- Passive role in leadership and management from top management 2- Unclear business vision and unsettled business case 3- Poor project management 4- Unbalanced project team composition 5- Misunderstanding requirements and frequent changes demanded by end users 6- Information security risks 7- Sustainable data quality and governance framework	Yeoh & Popovic (2015), Sangar & Iahad (2013), Skyrius et al. (2016), Kim et al. (2015), Wan et al. (2014), Scott (2004), Ngai & Wat (2005), Subba Rao et al. (2007), Addison (2003), Goutsos & Karacapilidis (2004), Yeoh et al. (2008), Stevens & Fowell (2003)
Customer Relationship Management (CRM)	1- Customer service failures 2- Weakness in the relationship with the customers 3- Lack of customer-oriented culture 4- Lack of cooperation in different parts (Reluctance to share their data towards others) 5- Information security risks 6- Sustainable data quality and governance framework 7- Lack of expertise and experience	Grover (2011), Bhakoo & Chan (2011), Sourizaei et al. (2011), Chan et al. (2012), Srinivasan & Abi-raad (2003), Kim et al. (2015), Wan et al. (2014), Scott (2004), Ngai & Wat (2005), Huang et al. (2004), Subba Rao et al. (2007), Addition (2003), Goutsos & Karacapilidis (2004)

	8- Lack of trust between your organization and merchant or customer	
Supply Chain Management (SCM)	1- Confidential data leaked to a competitor 2- Immaturity of online laws 3- Stock obsolescence 4- Working with unknown suppliers 5- Sustainable data quality and governance framework 6- Lack of expertise and experience 7- Lack of trust between your organization and merchant or customer 8- Information security risks 9- Partners may be using different platforms and a variety of data formats	Kim et al. (2015), Grover (2011), Wiengarten et al. (2013), Srinivasan & Abi-raad (2003), Wan et al. (2014), Scott (2004), Ngai & Wat (2005), Huang et al. (2004), Bhakoo & Chan (2011), Subba Rao et al. (2007), Addition (2003), Disney et al. (2004), Goutsos & Karacapilidis (2004)
Enterprise Resource Planning (ERP)	1- Insufficient training and re-skilling 2- Lack of integration between enterprise-wide systems or other vendors systems 3- Failure to manage end user expectations 4- Complexities of ERP systems 5- Failure to support cross-organization design 6- Sustainable data quality and governance 7- Information security risks 8- Lack of expertise or Failure to integrate with them	Kim et al. (2015), Wan et al. (2014), Ravasan & Mansouri (2016), Aloini, Dulmin & Mininno (2012), Garg & Garg. (2013), Shirouyehzad et al. (2011), Wan & Hou (2012), Srinivasan & Abi-raad (2003), Scott (2004), Ngai & Wat (2005), Huang et al. (2004), Subba Rao et al. (2007), Addition (2003), Goutsos & Karacapilidis (2004), Krasner (2000), Wright & Wright (2001)

e-Commerce (EC)	1- e-Payment fraud (credit card, bank transfer, PayPal, ...) 2- Unavailability of e-Payment methods 3- Angry customer posting negative comments online 4- Difficulty to attract courier services (FedEx, UPS, ...) to provide delivery services 5- High financial costs 6- Lack of ICT knowledge and skills 7- Immaturity of online laws 8- Information security risks	Trautman (2015), Sila (2013), Kim et al. (2015), Wan et al. (2014), Scott (2004), Ngai & Wat (2005), Subba Rao et al. (2007), Addition (2003), Liebermann and Stashevsky (2002), Miller & Engemann (2000), Kshetri (2007), Andam (2003), Stevens & Fowell (2003)
Electronic Collaboration (e-Collaboration)	1- Unavailability of bandwidth 2- Technology un-readiness 3- Managerial obstacles 4- Financial and technological resources limitation 5- e-mail security system and cost related 6- Information security risks 7- Lack of expertise and experience 8- Lack of trust between your organization and merchant or customer 9- Partners may be using different platforms and a variety of data formats	Chan et al. (2012), Sila (2013), Franchi et al. (2013), Srinivasan & Abi-raad (2003), Kim et al. (2015), Wan et al. (2014), Scott (2004), Ngai & Wat (2005), Huang et al. (2004), Subba Rao et al. (2007), Addition (2003), Liebermann and Stashevsky (2002), Kshetri (2007), Quaresma et al. (2013), Goutsos & Karacapilidis (2004), Mockler & Gartenfeld (2009),

2.8 Summary

In this chapter, we examine the information about e-Business and its six components named Business Intelligence, Customer Relationship Management, Supply Chain Management, Enterprise Resources Planning, e-Commerce, and e-Collaboration from the literature review as well as the types of e-Business. Moreover, we look at the risk, risk management, and e-Business risk classification. Finally, we extracted from the literature several risk factors associated with e-Business modules which consist our conceptual framework for this study. In the next chapter, we will present the research methodology adopted to developing methods, designing a questionnaire, collecting data, and utilizing appropriate statistical test to analyses the proposed hypotheses.

3.1 Introduction

Research methods can be categorized in several approaches and techniques. Although, one of the furthest common differences is among quantitative and qualitative methodologies (Myers 1997). Utmost scholars approved that a survey technique is the efficient and effective methods for statistical data gathering, although there were some pros and cons of a survey technique (McQueen & Knussen 2006). In this chapter, the methods and procedures used to design and develop the questionnaire for the study will be presented. Also, to evaluate the negative influence of the risk factors in the e-Business, a questionnaire survey was directed for this study. Next, evaluation and assessment of the respondents' mindset were done through the analysis of the data collected via the IBM Statistics SPSS and MS Excel.

3.2 Research Method

Several activities are part of a research method process as displayed in Figure 3.1. Activity 1 consists of identifying a suitable risk construct and after that extracting and enumerating an exhaustive list of candidate risk factors to be incorporated in the survey. This list was produced from intensive literature reviews and has been integrated into the e-Business risk construct across all its modules. In Chapter 2, named Literature Review, an illustration of all the constructs were detailed, with the different sources (papers) that were extracted from as shown in Table 2.2 of Chapter 2.

To collect data, a questionnaire design was produced. The sampling validity and data collection were carried out as Activity 2. Next, the analysis of the descriptive statistics and explanation of the analytical choice. The key empirical analysis is conducted in Activity 3 which is a descriptive analysis related on how respondents rated and ranked the e-Business risk factors, and a Kendall's Test was done to analyze the similarities among the different groups. Followed by Activity 4 where a One-Way ANOVA analysis was conducted to determine the significance of the difference of e-Business risk between groups. Six research hypotheses were used for this activity (based on $p < 0.05$ as significance level) as follow:

1- Business Intelligence:

H_{A0} : ($p > 0.05$) – There is no significant difference between the respondents rating of the Business Intelligence (BI) on the performance of e-Business.

H_{A1} : ($p < 0.05$) – There is significant difference in the respondents rating of the Business Intelligence (BI) on the performance of e-Business (At least one group is significantly different from others).

2- Customer Relationship Management:

H_{B0} : ($p > 0.05$) – There is no significant difference between the respondents rating of the Customer Relationship Management (CRM) on the performance of e-Business.

H_{B1} : ($p < 0.05$) – There is significant difference in the respondents rating of the Customer Relationship Management (CRM) on the performance of e-Business (At least one group is significantly different from others).

3- Supply Chain Management:

H_{C0} : ($p > 0.05$) – There is no significant difference between the respondents rating of the Supply Chain Management (SCM) on the performance of e-Business.

H_{C1} : ($p < 0.05$) – There is significant difference in the respondents rating of the Supply Chain Management (SCM) on the performance of e-Business (At least one group is significantly different from others).

4- Enterprise Resource Planning:

H_{D0} : ($p > 0.05$) – There is no significant difference between the respondents rating of the Enterprise Resource Planning (ERP) on the performance of e-Business.

H_{D1} : ($p < 0.05$) – There is significant difference in the respondents rating of the Enterprise Resource Planning (ERP) on the performance of e-Business (At least one group is significantly different from others).

5- E-Commerce:

H_{E0} : ($p > 0.05$) – There is no significant difference between the respondents rating of the E-Commerce (EC) on the performance of e-Business.

H_{E1}: ($p < 0.05$) – There is significant difference in the respondents rating of the E-Commerce (EC) on the performance of e-Business (At least one group is significantly different from others).

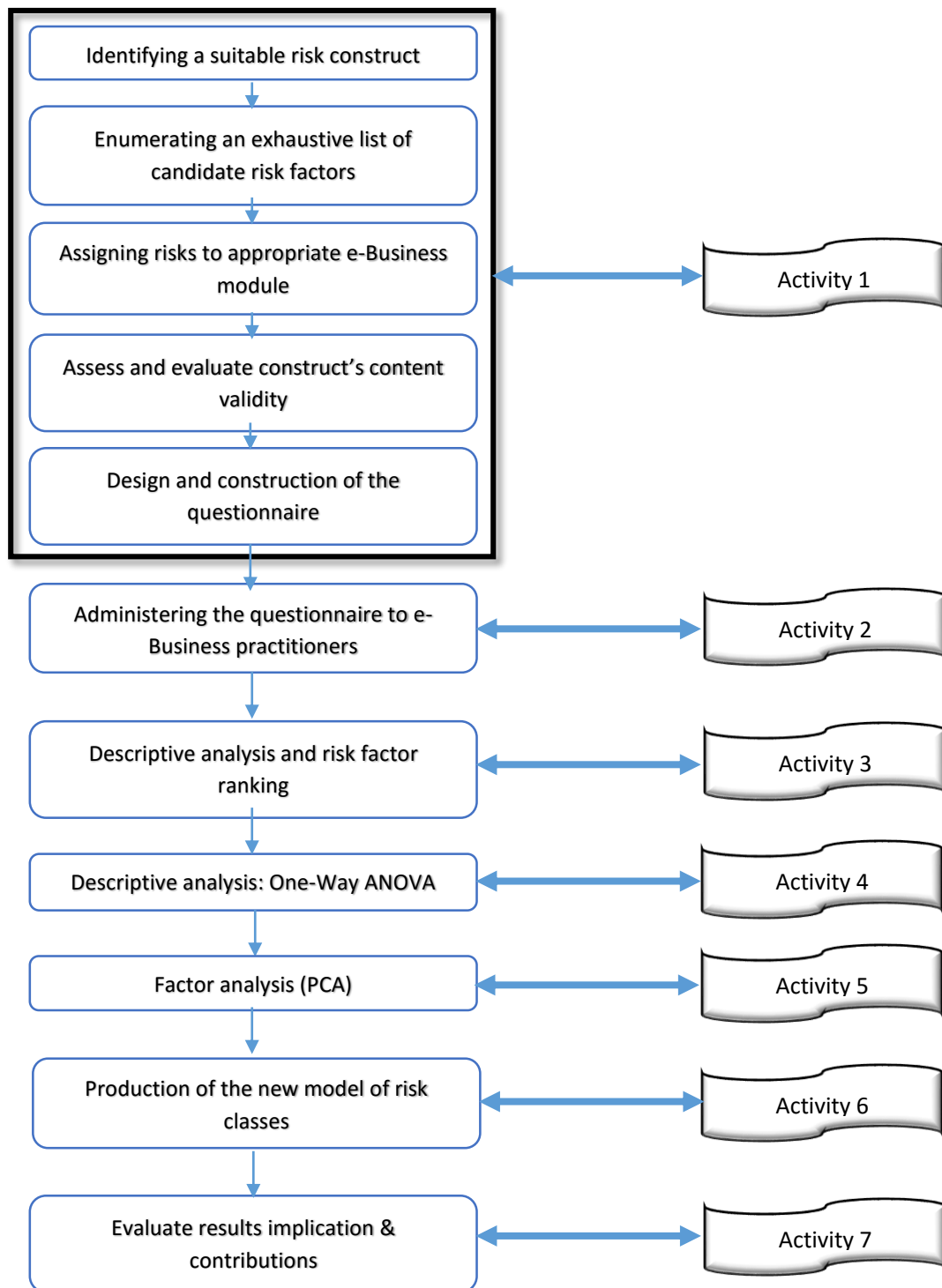


FIGURE 3.1: THE RESEARCH METHOD PROCESS (ADAPTED FROM Wallace et al. 2004)

6- Electronic Collaboration:

H_{F0} : ($p > 0.05$) – There is no significant difference between the respondents rating of the Electronic Collaboration (COL) on the performance of e-Business.

H_{F1} : ($p < 0.05$) – There is significant difference in the respondents rating of the Electronic Collaboration (COL) on the performance of e-Business (At least one group is significantly different from others).

Activity 5 consist of extracting through a factor analysis a reduced number of components from the initial exhaustive list of risk factors and come up with an innovative class of e-Business (Activity 6). Lastly, to help and assist e-Business professionals and top management in validating subjective thoughtful related to e-Business risk environment, a suggested model was proposed in activity 7.

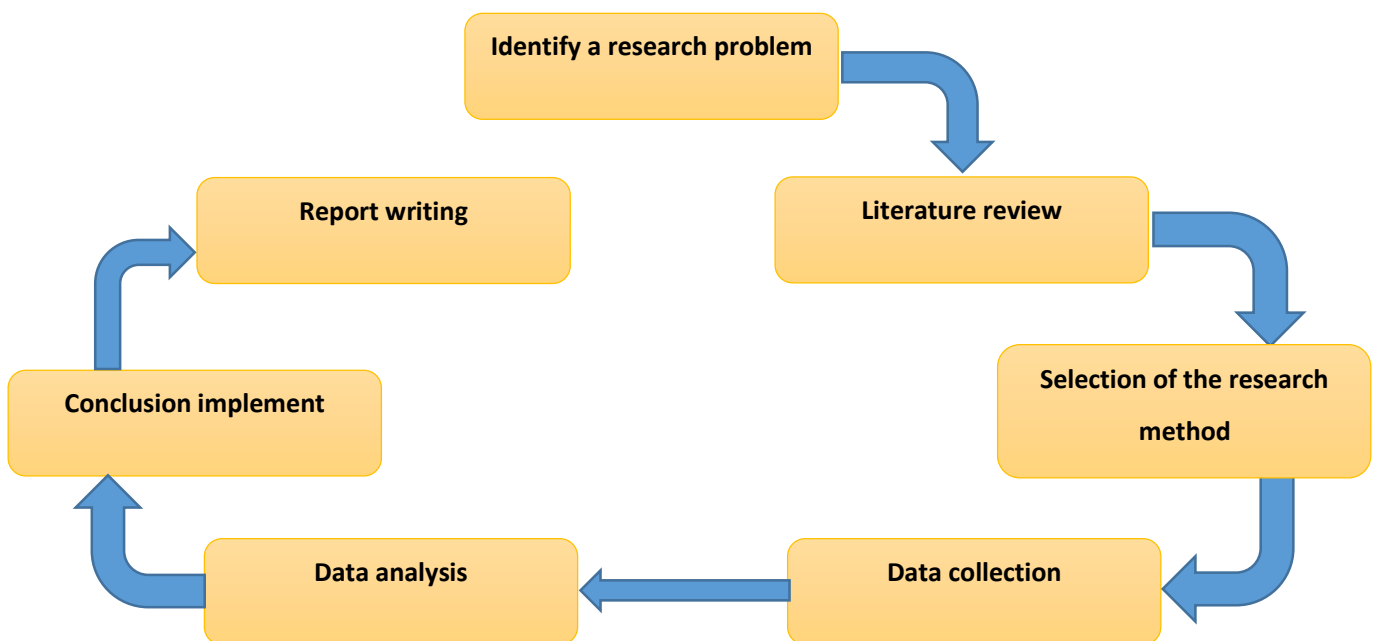


FIGURE 3.2: THE RESEARCH PROCESS (ADAPTED FROM FANG ET AL. 2008)

3.3 Questionnaire Design

In this section we will see the choice made for the questionnaire type, and what is the structure adopted for the questionnaire. Finally, we will explain the pre-test stage of the questionnaire before the online launch.

3.3.1 Questionnaire Type Choice

In research, we use the questionnaire as a pre-framed written set of questions to which respondents give and save their answers. Questionnaires could be conducted in three different way; (1) Online questionnaires, (2) Self-administered questionnaires and Postal/Phone questionnaires (McQueen & Knussen 2006). The Online questionnaire was chosen to be used for this study for the reason that is more suitable in the perspective of more privacy and anonymously, less expensive, and it permits an open access to an unlimited number of respondents.

3.3.2 Questionnaire Structure

At the questionnaire design stage, the aim is to develop a very simple, straightforward and well-structured questionnaire to allow the respondents are having an easy understanding of what is required from them. We built the questionnaire on two sections:

a. Section 1: Demographics & General Information

It contains demographics and general information about the respondent's background like gender, region, group age, sector, company' size, position in the organization and years of experience in e-business.

b. Section 2: Risks associated with e-Business

This section examines and rates the risks associated with the six e-business modules and ask about the respondents' experience and knowledge in which modules of e-business.

Moreover, a lot of alterations, editions and improvements were made to build a final draft. Our primary goal was to harvest a questionnaire that helps to get a high response rate by smoothing the responding process, and offering a well-structured and clear questionnaire. Intended for this study, practitioners and academics are asked to rate each risk element for every e-business module, based on their knowledge or/and experience about e-business.

For this study, respondents are requested to rate their agreement on a rating scale (Likert scale); the scale range is 1 to 5 as follow: where 1 represent Strongly disagree, 2 represent Disagree, 3

represent neutral, 4 represent Agree and 5 represent Strongly disagree. Some advantages are apparent in using Likert scales; in general, they have a high reliability, easiness to administrate, perceived as an attractive model, might be taking on to measure diverse types of attitudes, and have produced important results in several studies (Nunnally 1978). For that reason, the Likert scales are chosen to be used in this study.

The design of the questionnaire was aligned with some other study and paper published in e-business risks (Sourizaei et al. 2011; Chan et al. 2012; Hussain 2010; Sila 2013; Yeoh & Koronios 2010; McKerlich et al. 2013; Sangar & Iahad 2013; Amiri 2010; Aloini et al. 2012; Garg & Garg 2013; Sawalha & Atwell 2010; Ravasan & Mansouri 2016; Shirouyehzad et al. 2011). Nevertheless, this study is clearly distinguished from another study by looking for risks associated with the all six modules (BI, CRM, SCM, ERP, E-Commerce, and E-Collaboration) that constitute the e-Business.

3.3.3 Pre-Test

Beforehand online survey quick-off, the survey was tested by 12 master students at British University in Dubai (BUiD) which led to slight alterations and rewarding. An initial 8 e-Business modules with several sub-questions each were reduced to 6 modules, as it appeared that enquiring too many questions possibly will retract and enervate respondents.

Moreover, we added one question to measure which e-business modules the respondents have the knowledge and experience. Some questions get some refining and clarification, and one question, namely "Information security risks," which was asked in two modules has been extended to all modules. Other propositions asked to reword some questions; review the questionnaire design layout and also the sequences of the risk sub-questions in section B of the questionnaire. Finally, the questionnaire was checked by my supervisor, and after that, the questionnaire was made public through e-mails, LinkedIn groups. A copy of the final questionnaire can be found in Appendix A.

3.4 Data Collection and Survey Validity

After the questionnaire was approved and get ready to be distributed by e-mail and by spreading the link in several social media and especially via LinkedIn's groups that have several thousand of professionals in the field of e-Business, e-Commerce, CRM, BI, SCM, ERP. Internet was very helpful to gather e-mails and get access to the different region around the world, such as North America, Europe, Asia, Australia and of course the Middle East & North Africa (MENA) region.

Also, the e-Business' experience of the respondents was varying, and their job's position was appropriate to let them rate the e-Business factors like IT Staff, Consultant, Entrepreneur, and Management.

An overall of 366 respondents opened the link out of several thousands of people solicited to answer the e-Business questionnaire, but only 77 responses were complete and therefore valid which made the responses' rate at 21%. The answers showed that 33.8% of the respondents have more than 15 years of e-Business experience with an average of 10.6 years ($SD = 6.5$).

46.8% of the respondents were in the management positions of their companies, 19.5% were IT Staff, 16.9% as Consultant, 7.8% were Entrepreneur and only 2.6% were academic as shown in figure 4.6. Lastly, figure 4.7 displays the number of years' experience that respondents have in e-Business, 33.8% of the respondents have more than 15 years, 27.3% of the respondents are in the range of 6 to 15 years, and 39% have less than 6 years. It can be understood that 61% of the respondents have virtuous working knowledge of e-Business. Furthermore, the respondents' locations were dominated from MENA region with more than 57%.

3.5 Analytical Methods

Three statistical test were chosen as an analytical approach that is suitable for our study and the data to be analyzed. We start with a full descriptive analysis which helps us understand the data type and different categories in the survey responses. Then we conduct a reliability test to assess the validity of the instrument. Also, a ranking analysis was conducted to understand the importance of the risk factors that impact the e-Business performance, and a Kendall's Rank Correlation Test was done to analyze the similarities between the independent's variables. Moreover, a One-Way ANOVA analysis was conducted to examine the significance of the difference of e-Business risk between different groups. Finally, the Principal component analysis (PCA) was used to reduce the risk factors to extract the most influential subset or components that represent the e-Business risk. The output of the PCA method was used to develop a new model that represent e-Business risk classes which regroup all risk factors to assist e-Business practitioners and top management in validating subjective perception about the assessment of the actual risk situation of their e-Business processes in a more educated manner.

3.6 Summary

Finally, the study helps a better understanding of the risk factors surrounding the e-Business modules such as Business Intelligence, Customer Relationship Management, Supply Chain Management, Enterprise Resources Planning, e-Commerce and e-Collaboration, and stress the importance of a subset risk factors that need to be identified, planned, monitor and well managed in order to prevent the negative impact and the threat that might destroy and damage the e-Business functionality.

4.1 Introduction

In this research, an online questionnaire was designed, implemented through Lime Survey management system website. After that, the link was sent to practitioners and academic in different regions, the internet helped to reach a lot of people having great experience and expertise regarding e-Business and deal with e-business risks among multiple areas that involves e-business like BI, CRM, SCM, ERP, e-commerce and e-Collaboration. To facilitate the analysis and discussion of the result, we prearranged and assembled the data in a structured way. Some demographic and general information elements will be presented and described as general findings of the survey. This descriptive statistics of the findings will be followed by additional investigation and point of view related to the findings. The next chapter will explain, analyze and discuss the e-business risk in a deeper way as per the perceptions of the respondents.

4.2 Reliability Test

To determine the internal uniformity and consistency between all respondents, the researcher performed a reliability investigation test through Cronbach's alpha. Table 4.1 shows the Alpha values of e-Business modules like BI, CRM, SCM, ERP, EC and e-Collaboration, also, the global alpha associated to the e-Business. The smallest alpha value calculated was 0.883 (ERP) and the biggest one was 0.919 (e-Collaboration) which designates and shows that the scale is reliable. Also, the Cronbach alpha value for the global e-Business scale is about 0.972 which tells that the scale has significantly high internal consistency as it is far-off superior to 0.6.

TABLE 4.1. CRONBACH ALPHA TEST OF RELIABILITY

e-Business Modules	Cronbach Alpha	N of Items
Business Intelligence (BI)	0.866	7
Customer Relationship Management (CRM)	0.896	8
Supply Chain Management (SCM)	0.903	9
Enterprise Resource Planning (ERP)	0.883	8
e-Commerce (EC)	0.885	8
Electronic Collaboration (e-Collaboration)	0.919	9
All e-Business	0.972	49

4.3 Descriptive Statistics

Seven questions constitute the first section – Demographics & General information – where the first three are related to demographic aspects like gender, group age, and region. Followed by four questions inquiring the company's and the respondents' work environment such as company' sector, size, respondent's position and number of years' experience in e-business. The following figures show and describe the section one.

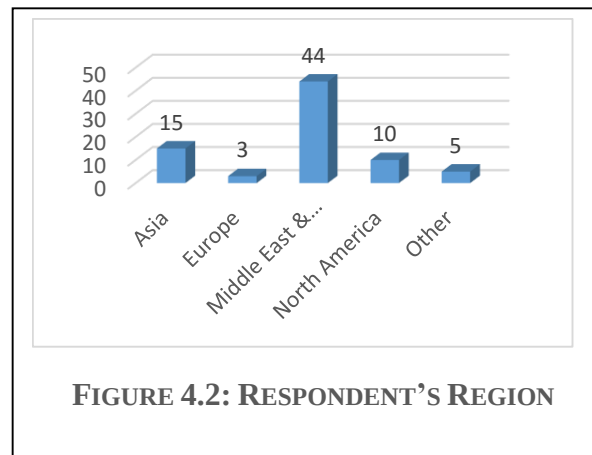
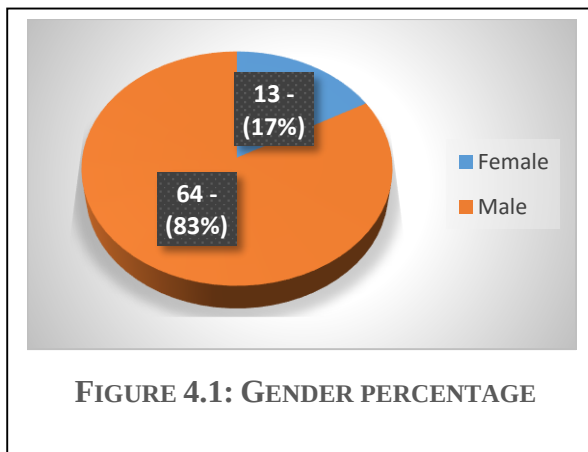


Figure 4.1 displays the respondent's gender where the looks like easily give the majority of respondents were males 83%. The second graph (figure 4.2) exhibit the location of the people that participate in our study where 57% are from the region of MENA.

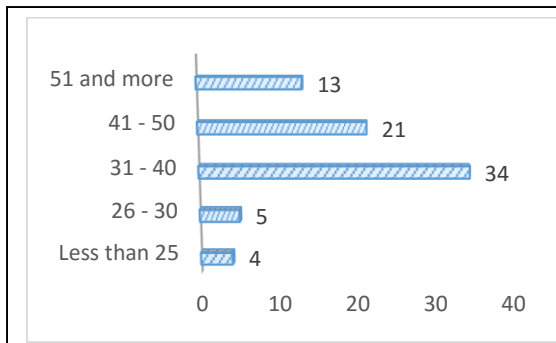


FIGURE 4.3: RESPONDENT'S AGE-GROUP

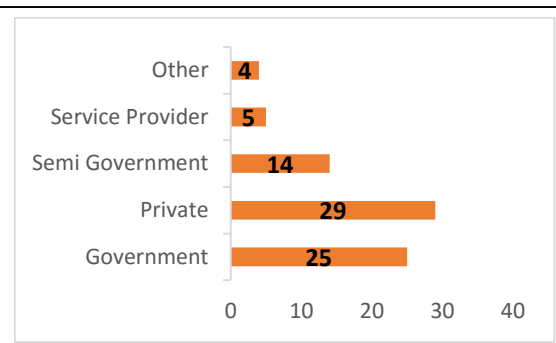


FIGURE 4.4: COMPANY'S SECTOR

Also, figure 4.3 reveals that 34 respondents were in the age-group (31-40), 21 respondents were in the age-group (41-50), 13 respondents are 51+ years old, and 9 respondents are less than 31 years old. The company' sector of the respondents shown in figure 4.4 tells us that 37.7% companies belong to the private sector, 32.5% to the government, 18.2% to semi-government, and 6.5% companies to service provider type.

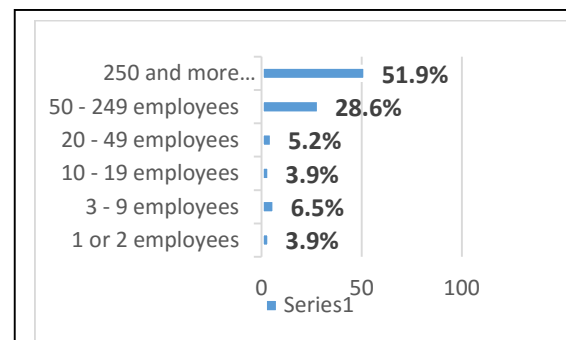


FIGURE 4.5: COMPANY'S SIZE

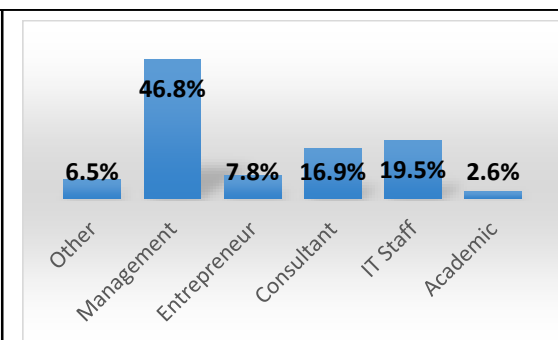
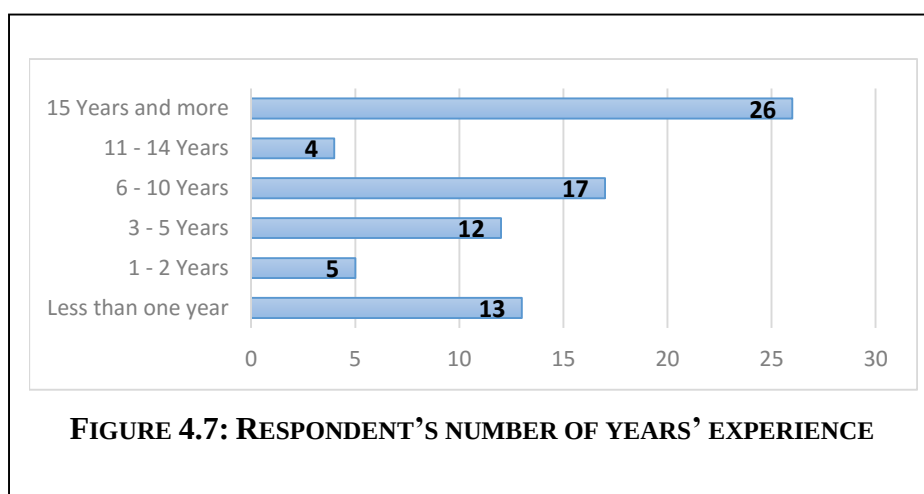


FIGURE 4.6: RESPONDENT'S POSITION

By looking at figure 4.5, we can easily see that 48.1% are SMEs and 51.9 represent big companies. The results also revealed that 46.8% of the respondents were in the management positions of their companies, 19.5% were IT Staff, 16.9% as Consultant, 7.8% were Entrepreneur and only 2.6% were academic as shown in figure 4.6. Lastly, figure 4.7 displays the number of years' experience that respondents have in e-Business, 33.8% of the respondents have more than 15 years, 27.3% of the respondents are in the range of 6 to 15 years, and 39% have less than 6 years. It can be understood that 61% of the respondents have virtuous working knowledge of e-Business.



4.4 Experience and Knowledge in E-Business

Table 4.2 shows that respondents have in e-Business, 60% of the respondents have more knowledge and/or experience in customer relationship management (CRM), in the second position comes business intelligence (BI) with 57%, 47% of the respondents are knowledgeable about enterprise resource planning (ERP), respondents' experience in e-Commerce (EC) are around 43%, electronic collaboration is coming strangely with only 40% of the respondents knowing about it, and the last position with 26% of the respondents have some experience with supply chain management (SCM).

TABLE 4.2: RESPONDENTS KNOWLEDGE AND EXPERIENCE IN E-BUSINESS

Which e-Business modules do you have knowledge and experience						
	Business Intelligence (BI)	Customer relationship management (CRM)	Supply Chain Management (SCM)	Enterprise Resource Planning (ERP)	E-Commerce (EC)	Electronic Collaboration (e-Collaboration)
Yes	44	46	20	36	33	31
Percent	57%	60%	26%	47%	43%	40%

4.5 E-Business Risk Ranking

Based on the perception of respondents vis a vis of each risk elements in every module of e-business which strongly agree to get 5 and strongly disagree get 1, it is possible to sort those risks in regards to their importance. In research, it is known that when we have a long list of elements the sorting, categorization and tendencies are needed and very helpful to investigate.

Our study comprises about 49 risk elements belonging to 6 e-business modules, and we used MS Excel and IBM SPSS Statistics to analyse the classification. Using statistical analysis as the average weighted mean, coefficient of variation, standard deviation, and severity index as a method of evaluation (Morgan et al. 2004; Punch 2005).

Below Figure 4.8 shows the 6 e-business modules and their related risk element; BI has 7 risk elements, CRM, ERP, and EC have 8 risk elements, and finally SCM and e-collaboration have 9 risk elements which sum up to 49 risk elements related to e-business.

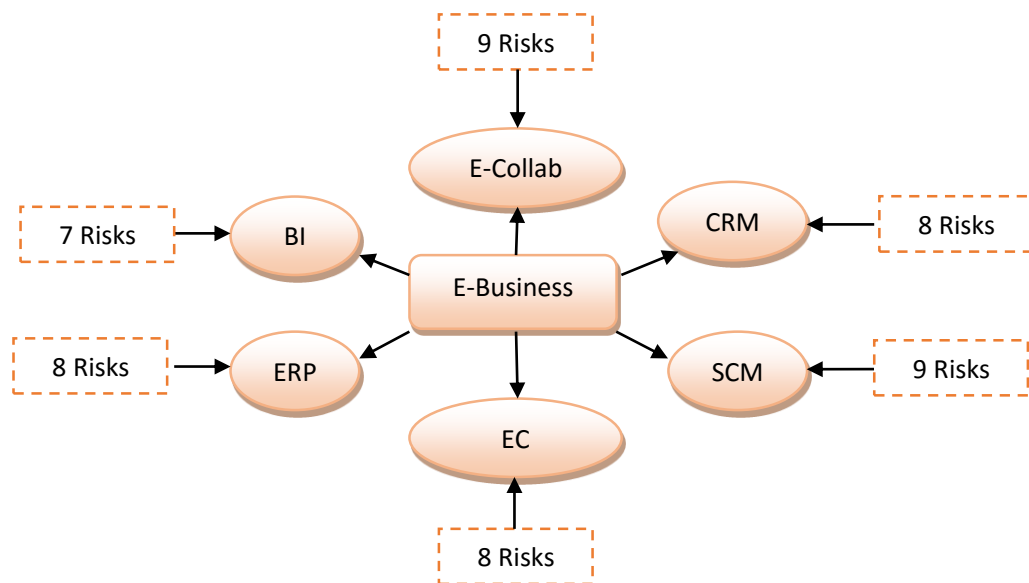


FIGURE 4.8: E-BUSINESS RISKS QUESTIONNAIRE STRUCTURE

4.6 Analysis and Ranking

Formally, the weighted mean formula is used to calculate the importance for each risk element taking in consideration that the weighting will be as follow:

- a. Strongly agree (5)
- b. Agree (4)
- c. Neutral (3)
- d. Disagree (2)
- e. Strongly disagree (1)

1. The formula used for the weighted mean is: $[\text{Sum}(\text{Rate} * \text{Fq})] / N$ Where,
 - Rate: The Rate given to each risk element
 - Fq: Frequency of answers
 - N: Total numbers of respondents.
2. The formula used for the Severity Index is: $[\text{Sum}(\text{Rate} * \text{Fq})] / N * \text{Max}(\text{Rate})$
Where,
 - Rate: The Rate given to each risk element
 - Fq: Frequency of answers
 - N: Total numbers of respondents
 - Max (Rate) is the highest rate that can be given
3. The formula used for the Section Average (AVG) is: e-Business module [Average (Severity Index)]
Where,
 - Average: The function average
 - Severity index: As explained above in (2)

4.7 Overall Ranking and Mean of Negative Impact of Risk Elements

After computing the statistical ranking for the 49 risk elements, we presented the overall ranking, severity index, mean, section average for each e-business module, and the ranking by the respondent's position and some years' experience in e-business.

The Inspection of the results, shows that the highest three ranked risk elements were (1) "(EC1) - e-Payment fraud (credit card, bank transfer, PayPal,)" with an SVI equal to 83.64% and a mean of 4.18, (2) "(CRM2) Weakness in the relationship with the customers" (SVI=82.34% and mean=4.12), and the third one was "(BI2) Unclear business vision and unsettled business case" (SVI=82.34% and mean=4.12).

Moreover, it is noted that the severity indices (SVI) fluctuate from 72 % to 84 %, and the average mean for the risk elements is in the segment range 3.6 to 4.18, and the global mean of 3.89.

TABLE 4.3: AVERAGE OF SVI OF E-BUSINESS RISKS MODULES

Code	Risk Module	Overall Average	Region		Position			Years of Experience		
			MENA	Other Region	IT Staff	Management	Other	Less than 6 Years	6 -14 Years	15 Years and more
BI	Business Intelligence	78.1%	77.4%	79%	84.6%	76.9%	75.9%	74.3%	83.4%	78.1%
CRM	Customer Relationship Management	79.1%	78.2%	80.3%	86.5%	77.6%	76.8%	79.1%	80.8%	77.7%
SCM	Supply Chain Management	76%	76.1%	75.9%	86.1%	73.5%	73.7%	76%	77.9%	74.4%
ERP	Enterprise Resource Planning	78%	78.4%	77.6%	85.7%	77.5%	74.3%	76.1%	81.6%	77.4%
EC	E-Commerce	76.9%	78.2%	76%	86.2%	75.9%	74%	74.8%	82.6%	75.8%
COL	e-Collaboration	78.5%	79.1%	77.8%	83.9%	76%	79%	77%	78.9%	79.9%

Also, Table 4.3 shows that CRM is the more risky e-Business module with overall average equal to 79.1%. The respondents from MENA region believe that the riskier is e-Collaboration with 79.1%, contrary, for the "other region" CRM is first with 80.3%. IT Staff and the Management perceive CRM as the riskiest with respectively 86.5% and 77.6%, and from 'Other' position point view the riskier is e-Collaboration with 79%.

Also, the respondents who have less than six years' experience in e-Business feel that CRM is the most risk component with 79.1%, the one with "6 to 14 Years" rated BI (83.4%) as the riskier and finally the respondents with fifteen years and more give 79.9% for e-Collaboration.

4.7.1 Business Intelligence (BI) Risks

Business Intelligence (BI) comprises 7 risk elements. Two risk elements (BI2, BI5) have an overall ranking within the 15 first ranked indicators as shown in Table 4.4. Respondents with experience more than 5 years confirm that. On the other hand, the one with less than six years' experience doesn't rank any BI risk element in the top 15.

TABLE 4.4: MEAN & SEVERITY INDEX OF BI RISK ELEMENTS AND RANKING BY YEARS OF EXPERIENCE

Code	Risk elements	Severity index	Mean	Overall Rank	Less than 6 Years	6 -14 Years	15 Years and more
BI1	Passive role in leadership and management from top management	78.44%	3.92	23	44	7	18
BI2	Unclear business vision and unsettled business case	81.56%	4.08	3	39	1	5
BI3	Poor project management	76.62%	3.83	32	38	27	26
BI4	Unbalanced project team composition	72.73%	3.64	47	48	45	44
BI5	Misunderstanding requirements and frequent changes demanded by end users	81.30%	4.06	4	22	3	11
BI6	Information security risks	77.40%	3.87	26	36	36	15
BI7	Sustainable data quality and governance framework	78.44%	3.92	21	20	4	39

In Table 4.5, MENA's respondents ranked 2 out of 7 BI risk elements in the top 15, and the 'Other region' ranked 3 BI risk in the top 15. The ranking by position has 2 BI risks in the top 15 for the all sub group (IT Staff, Management, and Other).

TABLE 4.5: OVERALL RANKING OF BI RISK ELEMENTS AND RANKING BY REGION & POSITION

Code	Risk elements	Overall Rank	MENA	Other Region	IT Staff	Management	Other position
BI1	Passive role in leadership and management from top management	23	35	13	13	17	35
BI2	Unclear business vision and unsettled business case	3	17	2	2	9	15
BI3	Poor project management	32	41	22	36	25	31
BI4	Unbalanced project team composition	47	48	41	48	43	45
BI5	Misunderstanding requirements and frequent changes demanded by end users	4	14	4	19	2	24
BI6	Information security risks	26	23	29	47	32	7
BI7	Sustainable data quality and governance framework	21	12	31	24	22	19

4.7.2 Customer Relationship Management (CRM) Risks

For Customer Relationship Management (CRM), 3 risk elements (CRM1, CRM2, and CRM8) are in the top 15 first ranked indicators as shown in Table 4.6. The e-Business respondents' less than 6 years' experience in e-Business Rated 6 out of 8 CRM risk elements in the top 15 and even the two remaining out of top15 are at 23rd and 29th position. Respondents with experience 6 years and more get 4 or 3 CRM risk in the top 15.

TABLE 4.6: MEAN & SEVERITY INDEX OF CRM RISK ELEMENTS AND RANKING BY YEARS OF EXPERIENCE

Code	Risk elements	Severity index	Mean	Overall Rank	Less than 6 Years	6 -14 Years	15 Years and more
CRM1	Customer service failures	81.04%	4.05	5	2	10	20
CRM2	Weakness in the relationship with the customers	82.34%	4.12	2	1	12	8
CRM3	Lack of customer-oriented culture	79.74%	3.99	16	23	26	9
CRM4	Lack of cooperation in different parts (Reluctance to share their data towards others)	77.40%	3.87	27	29	47	12
CRM5	Information security risks	78.18%	3.91	24	9	17	36
CRM6	Sustainable data quality and governance framework	76.36%	3.82	36	13	13	48
CRM7	Lack of expertise and experience	77.14%	3.86	29	14	40	31
CRM8	Lack of trust between your organization and merchant or customer	80.52%	4.03	9	5	14	16

TABLE 4.7: OVERALL RANKING OF CRM RISK ELEMENTS AND RANKING BY REGION & POSITION

Code	Risk elements	Overall Rank	MENA	Other Region	IT Staff	Management	Other position
CRM1	Customer service failures	5	10	8	11	10	17
CRM2	Weakness in the relationship with the customers	2	1	10	5	7	4
CRM3	Lack of customer-oriented culture	16	33	3	20	8	29
CRM4	Lack of cooperation in different parts (Reluctance to share their data towards others)	27	43	11	35	19	37
CRM5	Information security risks	24	40	9	25	29	9
CRM6	Sustainable data quality and governance framework	36	22	40	30	30	36
CRM7	Lack of expertise and experience	29	25	32	28	28	27
CRM8	Lack of trust between your organization and merchant or customer	9	19	5	9	15	14

In Table 4.7, ‘Other region’ respondents ranked 6 out of 8 CRM risk elements in the top 15, but only 2 out of 8 was in the top 15 in the ranking of MENA’s respondents. Next, Management with 4 in the top 15, IT Staff and ‘Other position’ ranked 3 over 8 in top15.

4.7.3 Supply Chain Management (SCM) Risks

In the Supply Chain Management (SCM), none of the 9 risk elements appeared in the top 15 first ranked indicators which can be explained as only 26% of respondents have SCM experience, as well as respondents' region, 6 years and more experience, and management position as shown in Table 4.8 and Table 4.9.

TABLE 4.8: MEAN & SEVERITY INDEX OF SCM RISK ELEMENTS AND RANKING BY YEARS OF EXPERIENCE

Code	Risk elements	Severity index	Mean	Overall Rank	Less than 6 Years	6 -14 Years	15 Years and more
SCM1	Confidential data leaked to a competitor	78.44%	3.92	19	4	18	42
SCM2	Immaturity of online laws	76.62%	3.83	34	26	41	23
SCM3	Stock obsolescence	74.55%	3.73	42	35	46	32
SCM4	Working with unknown suppliers	73.51%	3.68	46	46	48	30
SCM5	Sustainable data quality and governance framework	74.03%	3.70	45	34	32	47
SCM6	Lack of expertise and experience	75.58%	3.78	38	40	43	24
SCM7	Lack of trust between your organization and merchant or customer	77.14%	3.86	28	24	20	35
SCM8	Partners may be using different platforms and a variety of data formats	75.58%	3.78	39	11	44	45
SCM9	Information security risks	78.44%	3.92	22	15	24	27

The category that has less than 6 years' experience in e-Business and the IT Staff ranked 3 out of 9 SCM risk elements in the top 15, respondents with ‘Other position’ rated only SCM1 - Confidential data leaked to a competitor- in the top15.

TABLE 4.9: OVERALL RANKING OF SCM RISK ELEMENTS AND RANKING BY REGION & POSITION

Code	Risk elements	Overall Rank	MENA	Other Region	IT Staff	Management	Other position
SCM1	Confidential data leaked to a competitor	19	16	25	3	38	12
SCM2	Immaturity of online laws	34	28	36	33	31	28
SCM3	Stock obsolescence	42	46	27	34	44	40
SCM4	Working with unknown suppliers	46	49	30	32	33	48
SCM5	Sustainable data quality and governance framework	45	42	46	39	48	39
SCM6	Lack of expertise and experience	38	30	45	17	34	44
SCM7	Lack of trust between your organization and merchant or customer	28	31	28	1	37	34
SCM8	Partners may be using different platforms and a variety of data formats	39	38	33	40	39	32
SCM9	Information security risks	22	26	21	10	27	22

4.7.4 Enterprise Resource Planning (ERP) Risks

For the Enterprise Resource Planning (ERP), 3 of the 8 risk elements appeared in the top 15 first ranked indicators as well as respondents with experience more than 15 years as shown in the Table 4.10. The categories that have less than 15 years' experience in e-Business get only 1 out of the 8 ERP risk elements in the top 15.

TABLE 4.10: MEAN & SEVERITY INDEX OF ERP RISK ELEMENTS AND RANKING BY YEARS OF EXPERIENCE

Code	Risk elements	Severity index	Mean	Overall Rank	Less than 6 Years	6 -14 Years	15 Years and more
ERP1	Insufficient training and re-skilling	80.00%	4.00	13	33	25	3
ERP2	Lack of integration between enterprise-wide systems or other vendors systems	80.52%	4.03	10	18	16	10
ERP3	Failure to manage end user expectations	80.78%	4.04	7	19	6	14
ERP4	Complexities of ERP systems	74.55%	3.73	43	25	37	46
ERP5	Failure to support cross-organization design	78.96%	3.95	18	7	30	21
ERP6	Sustainable data quality and governance framework	75.06%	3.75	41	42	22	43
ERP7	Lack of expertise and experience	77.66%	3.88	25	27	11	37
ERP8	Information security risks	76.62%	3.83	33	41	23	22

In Table 4.11, MENA region got 4 out of 8 in the top 15, ‘Other region’ has 3 out of 8 in the top 15. The ranking by Management position shows 4 out of 8 ERP risk elements in the top 15, 3 out 15 for the IT Staff, and only 1 out of 8 in the top 15 for ‘Other’ position.

TABLE 4.11: OVERALL RANKING OF ERP RISK ELEMENTS AND RANKING BY REGION & POSITION

Code	Risk elements	Overall Rank	MENA	Other Region	IT Staff	Management	Other position
ERP1	Insufficient training and re-skilling	13	9	15	6	3	41
ERP2	Lack of integration between enterprise-wide systems or other vendors systems	10	4	16	22	4	18
ERP3	Failure to manage end user expectations	7	13	7	14	12	11
ERP4	Complexities of ERP systems	43	44	39	27	21	49
ERP5	Failure to support cross-organization design	18	29	12	38	6	30
ERP6	Sustainable data quality and governance framework	41	32	48	37	40	33
ERP7	Lack of expertise and experience	25	15	35	15	20	42
ERP8	Information security risks	33	37	26	21	42	23

4.7.5 E-Commerce (EC) Risks

Based on Table 4.12 and Table 4.13, EC1 risk element (e-Payment fraud) got ranked first in the overall rank and by respondents with a management position, and ‘Other’ region. Note that EC1 was rated in the top 15 in all categories (Overall, Experience, Region, and position sub-groups).

TABLE 4.12: MEAN & SEVERITY INDEX OF EC RISK ELEMENTS AND RANKING BY YEARS OF EXPERIENCE

Code	Risk elements	Severity index	Mean	Overall Rank	Less than 6 Years	6 -14 Years	15 Years and more
EC1	e-Payment fraud (credit card, bank transfer, PayPal, ...)	83.64%	4.18	1	6	2	4
EC2	Unavailability of e-Payment methods	80.00%	4.00	12	37	5	13
EC3	Angry customer posting negative comments online	76.88%	3.84	31	47	8	28
EC4	Difficulty to attract courier services (FedEx, UPS, ...) to provide delivery services	71.95%	3.60	49	49	38	41
EC5	High financial costs	72.47%	3.62	48	45	29	49
EC6	Lack of ICT knowledge and skills	75.58%	3.78	40	43	28	34
EC7	Immaturity of online laws	76.62%	3.83	35	16	35	38
EC8	Information security risks	80.78%	4.04	8	3	9	29

TABLE 4.13: OVERALL RANKING OF EC RISK ELEMENTS AND RANKING BY REGION & POSITION

Code	Risk elements	Overall Rank	MENA	Other Region	IT Staff	Management	Other position
EC1	e-Payment fraud (credit card, bank transfer, PayPal, ...)	1	2	1	12	1	6
EC2	Unavailability of e-Payment methods	12	7	17	16	13	25
EC3	Angry customer posting negative comments online	31	27	38	8	23	43
EC4	Difficulty to attract courier services (FedEx, UPS, ...) to provide delivery services	49	45	49	42	49	47
EC5	High financial costs	48	47	47	44	47	46
EC6	Lack of ICT knowledge and skills	40	34	42	31	36	38
EC7	Immaturity of online laws	35	21	43	41	35	21
EC8	Information security risks	8	3	18	4	16	10

4.7.6 Electronic Collaboration (e-Collaboration) Risks

For the Electronic Collaboration (e-Collaboration), 4 of the 9 risk elements appeared in the top 15 first ranked indicators as well as respondents with 15 years and more experience and MENA region as shown in the Table 4.14.

TABLE 4.14: MEAN & SEVERITY INDEX OF E-COLLABORATION RISK ELEMENTS AND RANKING BY YEARS OF EXPERIENCE

Code	Risk elements	Severity index	Mean	Overall Rank	Less than 6 Years	6 -14 Years	15 Years and more
COL1	Unavailability of bandwidth	80.78%	4.04	6	30	19	1
COL2	Technology un-readiness	79.22%	3.96	17	28	42	2
COL3	Managerial obstacles	80.00%	4.00	15	8	34	6
COL4	Financial and technological resources limitation	80.26%	4.01	11	10	31	7
COL5	e-mail security system and cost related	76.36%	3.82	37	31	33	33
COL6	Information security risks	78.44%	3.92	20	17	21	25
COL7	Lack of expertise and experience	77.14%	3.86	30	32	39	19
COL8	Lack of trust between your organization and merchant or customer	80.00%	4.00	14	12	15	17
COL9	Partners may be using different platforms and a variety of data formats	74.55%	3.73	44	21	49	40

The category that has less than between years' experience in e-Business get 3 out of 9 e-Collaboration risk elements in the top 15, and '6-14 Years' category only 1 out of 9 in the top 15. In Table 4.15, 'other' position ranked 6 out of 9 e-Collaboration risk elements in the top 15.

TABLE 4.15: OVERALL RANKING OF E-COLLABORATION RISK ELEMENTS & RANKING BY REGION & POSITION

Code	Risk elements	Overall Rank	MENA	Other Region	IT Staff	Management	Other position
COL1	Unavailability of bandwidth	6	18	6	23	5	13
COL2	Technology un-readiness	17	8	24	26	18	8
COL3	Managerial obstacles	15	11	14	45	14	2
COL4	Financial and technological resources limitation	11	5	19	29	11	5
COL5	e-mail security system and cost related	37	36	34	46	41	20
COL6	Information security risks	20	24	20	18	45	1
COL7	Lack of expertise and experience	30	20	37	43	26	26
COL8	Lack of trust between your organization and merchant or customer	14	6	23	7	24	3
COL9	Partners may be using different platforms and a variety of data formats	44	39	44	49	46	16

4.8 Kendall's Rank Correlation Test

Kendall's Rank Correlation Test is a coefficient that represents the degree of concordance between two measured quantities of ranked data. Also, it is a non-parametric hypothesis test for statistical dependency based on the tau coefficient. Specifically, it is a measure of rank correlation where the resemblance of the orderings of the data when ranked by each of the quantities. Spontaneously, the Kendall correlation between two groups of data will be high when observations have similarity in ranking between the two groups, and low when observations have a dissimilarity in ranking between the two groups (Wikipedia.org). The values of Tau-b could be in a range of +1 to -1, where +1 is a hundred percent positive association, and -1 is the perfect inversion. Also, the absence of an association between the two groups is designated when a value of Tau-b equal to zero (Agresti 2010).

4.7.1 Kendall's Rank Correlation Test by e-Business Experience

After executing the test in SPSS, a single table (Table 4.16) called the correlation matrix will show the result. The table presents Kendall's tau-b (Correlation Coefficient), its significance value (sig. 2 tailed) and the sample size (N) that the calculation was based on. The bivariate correlation analysis computes the Kendall's tau-b correlation coefficient of a three variables (More than 15 years, 6 to 14 years, Less than 6 years). The matrix is symmetrical as the correlation between "6 to 14 years" and "Less than 6 years" is the same as between "Less than 6 years" and "6 to 14 years". Similarly, the correlation between the same sub-categories is always equal to 1.

TABLE 4.16: KENDALL'S TAU-B RANK CORRELATION TEST BY E-BUSINESS EXPERIENCE

			More than 15 years	6 to 14 years	Less than 6 years
Kendall's tau_b	More than 15 years	Correlation Coefficient	1.000	.179	.117
		Sig. (2-tailed)	.	.070	.234
		N	49	49	49
	6 to 14 years	Correlation Coefficient	.179	1.000	.187
		Sig. (2-tailed)	.070	.	.058
		N	49	49	49
	Less than 6 years	Correlation Coefficient	.117	.187	1.000
		Sig. (2-tailed)	.234	.058	.
		N	49	49	49

For the respondents' experience, there is no significance ($p=0.07$) between "More than 15 years" and "6 to 14 years" which indicate that there is no correlation. The same thing between "More than 15 years" and "Less than 6 years" with ($p=0.234$) which indicate that there is no correlation. For the last one, no correlation between "6 to 14 years" and "Less than 6 years" with ($p=0.58$). From the above, we could conclude that there are differences in ranking the e-Business risk factors between the three groups (More than 15 years, 6 to 14 years, Less than 6 years).

4.7.2 Kendall's Rank Correlation Test by Position

For the respondents' position, as shown in Table 4.17, there is a significance ($p=0.000$) at level 0.01 between "IT Staff" and "Management" which indicate that there is a correlation between them. The same thing between "Management" and "Others" with ($p=0.016$) at level 0.05 which indicate that there is a correlation. For the last one, no correlation between "IT Staff" and "Others" with ($p=0.113$). The "Management" group has no differences in ranking the e-Business risk factors with the other two groups ("IT Staff" and "Others"). But, there are differences in ranking the e-Business risk factors between "IT Staff" and "Others" groups.

TABLE 4.17: KENDALL'S TAU-B RANK CORRELATION TEST BY POSITION

			IT Staff	Management	Others
Kendall's tau_b	IT Staff	Correlation Coefficient	1.000	.350**	.156
		Sig. (2-tailed)	.	.000	.113
		N	49	49	49
	Management	Correlation Coefficient	.350**	1.000	.238*
		Sig. (2-tailed)	.000	.	.016
		N	49	49	49
	Others	Correlation Coefficient	.156	.238*	1.000
		Sig. (2-tailed)	.113	.016	.
		N	49	49	49

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

4.7.3 Kendall's Rank Correlation Test by Region

In Table 4.18, for the respondents' Region, there is a significance ($p=0.001$) at level 0.01 between "MENA" and "Other Region" which indicate that there is a correlation between them. The "MENA" and "Other Region" groups have no differences in ranking the e-Business risk factors between them.

TABLE 4.18: KENDALL'S TAU-B RANK CORRELATION TEST BY REGION

		MENA	Other Region
Kendall's tau_b	MENA	Correlation Coefficient	1.000
		Sig. (2-tailed)	.335**
		N	.001
	Other Region	Correlation Coefficient	.335**
		Sig. (2-tailed)	1.000
		N	.001

4.9 Summary

To understand the importance of the risk elements, researchers need to find a way to rank them. In this chapter, we established different methods of ranking like the mean's ranking, severity index's ranking, for the overall respondents and also for several categories like respondents' years of experience, position, and region. Based on that we used the Kendall's Tau-b Rank Correlation Test to identify the degree of significance of the agreement among the different categories on ranking the risk elements for every e-Business module. As shown and stressed above, practitioners did not get full agreement neither full disagreements for the ranking of the risk elements related to each e-Business components.

The Kendall's Tau-b Rank Correlation Test for the respondents' experience shows that there is a disagreement between the three rankings Groups (More than 15 years, 6 to 14 years, Less than 6 years) which can be viewed as the increase of years of experience might lead to a change in the respondents' perception of the e-Business risks. Moreover, in the case of the respondents' position, The "Management" position shows an agreement in ranking the e-Business risk factors with the other two groups ("IT Staff" and "Others"), However, there are differences in ranking the e-Business risk factors between "IT Staff" and "Others" groups. It could be explained by the ability of the "Management" position to face and deal with several perspectives related to e-Business risks. Lastly, the "MENA" and "Other Region" groups have shown agreement in ranking the e-Business risk factors between them. Further discussions about that will follow in the following chapters.

5.1 Introduction

The purpose of this chapter is to examine the ideas and attitudes between practitioners and specialists in e-Business and its different modules such as business intelligence, customer relationship management, supply chain management, enterprise resource management, e-commerce, and collaboration. Furthermore, the six precedent modules encompass multiples risk factors that need to be understandable, and in what way the respondent's assess and evaluates the negative influence of those risk factors in the e-Business.

The findings of this analysis might be of great value for management, IT Staff, consultant practitioners to give them insight and clear understanding about the importance of the risk factors and their negative influence on the performance of e-business establishment.

5.2 Respondents' experiences by position and location

The following table 5.1 displays the respondents experience across their position and location.

TABLE 5.1: EXPERIENCES OF RESPONDENTS IN E-BUSINESS BY POSITION & LOCATION

Respondents		Years of experience			Number of respondents	
		0-5 years	6-14 years	15 Years ++	Total	%
Position	Management	16	6	14	36	46.7%
	IT Staff	3	10	2	15	19.5%
	Other	11	5	10	26	33.8%
Location	The Middle East & North Africa	20	12	12	44	57.1%
	Other	10	9	14	33	42.9%
Total	Total	30	21	26	77	100%
	%	39%	27.2%	33.8%	100%	100%

The table revealed that around 61% of the respondents had more than 6 years of experience in e-Business. It might be telling that the respondents' years of experiences certainly help them to understand e-Business and the risk factors related to it. Moreover, this would offer realistic

support for the arguments in this study and would certainly be a great explanation of the answers collected. Note that 57% are located in MENA region and more than 46% hold a management position.

5.3 ANOVA Analysis

5.3.1 Introduction

The analysis of variance, well known as ANOVA, is the most broadly and largely statistical technique in quantitative studies; which is used to test the degree to which two or more groups experiment's differences. It computes the likelihood that differences between the sample means might just be due to chance. Once ANOVA method is chosen to analyses the data, a prerequisites or assumptions need to be verified to guarantee that the data could be in fact considered and analysed via an ANOVA method. One of the simplest cases of ANOVA is called one-way ANOVA which has only a single factor. In this study, we will use one-way ANOVA.

5.3.2 One-way ANOVA Prerequisites

Before conducting one-way ANOVA test, we need to introduce the four assumptions on the data that will permit the use of one-way ANOVA.

- Assumption 1: The dependent variable (DV) must be continuous or interval as data type.
- Assumption 2: The different samples must be independent off each other, the independent variable (IV) must contain a minimum of two or more independent sets.
- Assumption 3: The data scattering need to follow a normal distribution approximately, in the case of the one-way ANOVA the assumption might be slightly dishonored but remain to deliver effective and valid findings. Especially, where we have large samples and small standard deviations between samples.
- Assumption 4: Among the group level, the population variances are equivalent across responses. As a rule of thumb, we divide the large sample standard deviation over the smallest, the assumption is verified if the result is not superior to two.

To use a one-way ANOVA analysis, we checked the four assumptions that permit to have a reliable finding. First, assumption 1 is easily verified since our dependents variables are the Likert-type of data. Second, the independent variables like respondents' years of experience, position, and location having respectively three, two, and two categories and the responses are

independent to each other for each group. Hence assumption 2 is confirmed. Third, the normality assumption is not verified because of Likert data type which is very difficult in real data to follow a normal distribution. But as stated before we have a larger sample for each group 20 and more which is considered as an increase in the statistical power (Winter & Dodou 2010). Lastly, the assumption 4 is verified through the rule of thumb cited above; the following tables will include a column named "Assumption4" that calculate this ratio.

5.4 Findings

5.4.1 One-way ANOVA Results

Below, we will investigate all the six e-Business module by using the one-way ANOVA analysis. IBM Statistics SPSS was used to conduct this statistical test. Through the descriptive results shown in chapter 4, it seems that the results are too close together like means, standard deviations, and variances. Therefore, the respondents' answers seem to be no significant differences among the years of experiences, position, location categories. The significance level used by SPSS for all the study is 0.05.

5.4.2 Years of Experience Group

1. Business Intelligence (BI):

BI contains seven factors that are tested against the three categories (1) Years of experiences, (2) Position, and (3) Location. The hypotheses adopted to be tested one-way ANOVA are as follow:

H_{A0} : ($p > 0.05$) – There is no significant difference between the respondents rating of the Business Intelligence (BI) on the performance of e-Business.

H_{A1} : ($p < 0.05$) – There is significant difference in the respondents rating of the Business Intelligence (BI) on the performance of e-Business (At least one group is significantly different from others).

The result of one-way ANOVA analysis for risk factors related to business intelligence was shown in Table 5.2. Also, the critical value of F for $df_1 = 2$ and $df_2 = 74$ is equal to 3.12 and where F is greater than 3.12 the Null hypothesis is rejected. The "15 Years and more", "6 – 14 Years" and "Less than 6 years" category that rejected the H_{A0} , in other words, there is a

significant difference at least between two groups. BI2 and BI7 rejected the H_{A0} , and the p values are stressed with the bold and red format (sig column in Table 5.2).

TABLE 5.2: BI MODULE ANOVA ANALYSIS

		Sum of Squares	df	Mean Square	F	Sig.	Assumption4
BI1	Between Groups	4.734	2	2.367	2.881	.062	2
	Within Groups	60.799	74	.822			
	Total	65.532	76				
BI2	Between Groups	7.956	2	3.978	3.522	.035	1.8
	Within Groups	83.577	74	1.129			
	Total	91.532	76				
BI3	Between Groups	1.121	2	.560	.443	.644	1.6
	Within Groups	93.685	74	1.266			
	Total	94.805	76				
BI4	Between Groups	.867	2	.434	.417	.661	1.5
	Within Groups	76.951	74	1.040			
	Total	77.818	76				
BI5	Between Groups	3.710	2	1.855	2.592	.082	2.1
	Within Groups	52.965	74	.716			
	Total	56.675	76				
BI6	Between Groups	1.630	2	.815	.873	.422	1.2
	Within Groups	69.071	74	.933			
	Total	70.701	76				
BI7	Between Groups	5.161	2	2.580	3.271	.044	1.6
	Within Groups	58.372	74	.789			
	Total	63.532	76				

2. Customer Relationship Management (CRM):

CRM contains eight factors that are tested against the three categories (1) Years of experiences, (2) Position, and (3) Location. The hypotheses are as follow:

H_{B0}: ($p > 0.05$) – There is no significant difference between the respondents rating of the Customer Relationship Management (CRM) on the performance of e-Business.

H_{B1}: ($p < 0.05$) – There is significant difference in the respondents rating of the Customer Relationship Management (CRM) on the performance of e-Business (At least one group is significantly different from others).

The output of one-way ANOVA analysis for risk factors related to customer relationship management was shown in Table 5.3. Similarly, the critical value is equal to 3.12, and where F is greater than 3.12 the Null hypothesis is rejected, subsequently, only CRM6 rejected the H_{B0}.

TABLE 5.3: CRM MODULE ANOVA ANALYSIS

		Sum of Squares	df	Mean Square	F	Sig.	Assumption4
CRM1	Between Groups	1.200	2	.600	.490	.614	1.2
	Within Groups	90.592	74	1.224			
	Total	91.792	76				
CRM2	Between Groups	.023	2	.011	.011	.989	1.6
	Within Groups	73.925	74	.999			
	Total	73.948	76				
CRM3	Between Groups	1.214	2	.607	.626	.538	1.2
	Within Groups	71.773	74	.970			
	Total	72.987	76				
CRM4	Between Groups	1.769	2	.885	1.008	.370	1.3
	Within Groups	64.932	74	.877			
	Total	66.701	76				
CRM5	Between Groups	1.572	2	.786	.822	.444	1.1
	Within Groups	70.792	74	.957			
	Total	72.364	76				
CRM6	Between Groups	6.670	2	3.335	4.198	.019	1.7
	Within Groups	58.784	74	.794			
	Total	65.455	76				
CRM7	Between Groups	.375	2	.188	.201	.818	1.1
	Within Groups	69.053	74	.933			
	Total	69.429	76				
CRM8	Between Groups	.415	2	.208	.209	.812	1.1
	Within Groups	73.533	74	.994			
	Total	73.948	76				

3. Supply Chain Management (SCM):

SCM comprises nine factors that are tested against the three categories (1) Years of experiences, (2) Position, and (3) Location. The hypotheses adopted to be tested one-way ANOVA are as follow:

H_{C0} : ($p > 0.05$) – There is no significant difference between the respondents rating of the Supply Chain Management (SCM) on the performance of e-Business.

H_{C1} : ($p < 0.05$) – There is significant difference in the respondents rating of the Supply Chain Management (SCM) on the performance of e-Business (At least one group is significantly different from others).

The result of one-way ANOVA analysis for risk factors related to customer relationship management was shown in Table 5.4. Similarly, the critical value is equal to 3.12 and where F is greater than 3.12 the Null hypothesis is rejected. All the SCM risk factors do not reject the H_{C0} .

TABLE 5.4: SCM MODULE ANOVA ANALYSIS

		Sum of Squares	df	Mean Square	F	Sig.	Assumption4
SCM1	Between Groups	2.872	2	1.436	1.386	.256	1
	Within Groups	76.661	74	1.036			
	Total	79.532	76				
SCM2	Between Groups	.049	2	.025	.032	.968	1.1
	Within Groups	56.756	74	.767			
	Total	56.805	76				
SCM3	Between Groups	.072	2	.036	.035	.965	1.1
	Within Groups	75.201	74	1.016			
	Total	75.273	76				
SCM4	Between Groups	.401	2	.201	.184	.832	1.2
	Within Groups	80.482	74	1.088			
	Total	80.883	76				
SCM5	Between Groups	2.849	2	1.425	1.907	.156	1.1
	Within Groups	55.281	74	.747			
	Total	58.130	76				
SCM6	Between Groups	.324	2	.162	.179	.836	1.4
	Within Groups	66.923	74	.904			
	Total	67.247	76				
SCM7	Between Groups	1.704	2	.852	.791	.457	1.1
	Within Groups	79.725	74	1.077			
	Total	81.429	76				
SCM8	Between Groups	1.796	2	.898	1.157	.320	1.5
	Within Groups	57.451	74	.776			
	Total	59.247	76				
SCM9	Between Groups	.495	2	.248	.291	.749	1.2
	Within Groups	63.037	74	.852			
	Total	63.532	76				

4. Enterprise Resource Planning (ERP):

Eight factors belonging to ERP are tested against the three categories (1) Years of experiences, (2) Position, and (3) Location. The hypotheses adopted to be tested one-way ANOVA are as follow:

H_{D0}: ($p > 0.05$) – There is no significant difference between the respondents rating of the Enterprise Resource Planning (ERP) on the performance of e-Business.

H_{D1}: ($p < 0.05$) – There is significant difference in the respondents rating of the Enterprise Resource Planning (ERP) on the performance of e-Business (At least one group is significantly different from others).

The result of one-way ANOVA analysis for risk factors related to Enterprise Resource Planning was shown in Table 5.5. Also, the critical value of F for $df_1 = 2$ and $df_2 = 74$ is equal to 3.12 and where F is greater than 3.12 the Null hypothesis is rejected. Like SCM, all the eight ERP risk factors do not reject the H_{C0}.

TABLE 5.5: ERP MODULE ANOVA ANALYSIS

		Sum of Squares	df	Mean Square	F	Sig.	Assumption4
ERP1	Between Groups	3.066	2	1.533	1.645	.200	1.1
	Within Groups	68.934	74	.932			
	Total	72.000	76				
ERP2	Between Groups	.785	2	.392	.591	.557	1.7
	Within Groups	49.163	74	.664			
	Total	49.948	76				
ERP3	Between Groups	2.169	2	1.085	1.367	.261	1.5
	Within Groups	58.714	74	.793			
	Total	60.883	76				
ERP4	Between Groups	2.163	2	1.082	1.229	.298	1.4
	Within Groups	65.110	74	.880			
	Total	67.273	76				
ERP5	Between Groups	.172	2	.086	.107	.899	1.2
	Within Groups	59.621	74	.806			
	Total	59.792	76				
ERP6	Between Groups	2.539	2	1.269	1.966	.147	1.4
	Within Groups	47.773	74	.646			
	Total	50.312	76				
ERP7	Between Groups	2.795	2	1.397	1.691	.191	1.2
	Within Groups	61.153	74	.826			
	Total	63.948	76				
ERP8	Between Groups	1.802	2	.901	1.169	.316	1.3
	Within Groups	57.004	74	.770			
	Total	58.805	76				

5. E-Commerce (EC):

E-commerce contains seven factors that are tested against the three categories (1) Years of experiences, (2) Position, and (3) Location. The hypotheses adopted to be tested one-way ANOVA are as follow:

H_{E0} : ($p > 0.05$) – There is no significant difference between the respondents rating of the E-Commerce (EC) on the performance of e-Business.

H_{E1} : ($p < 0.05$) – There is significant difference in the respondents rating of the E-Commerce (EC) on the performance of e-Business (At least one group is significantly different from others).

TABLE 5.6: E-COMMERCE MODULE ANOVA ANALYSIS

		Sum of Squares	df	Mean Square	F	Sig.	Assumption4
EC1	Between Groups	2.273	2	1.137	1.252	.292	1.4
	Within Groups	67.181	74	.908			
	Total	69.455	76				
EC2	Between Groups	5.187	2	2.594	2.636	.078	1.6
	Within Groups	72.813	74	.984			
	Total	78.000	76				
EC3	Between Groups	5.082	2	2.541	2.723	.072	1.6
	Within Groups	69.048	74	.933			
	Total	74.130	76				
EC4	Between Groups	4.159	2	2.079	2.251	.112	1.3
	Within Groups	68.361	74	.924			
	Total	72.519	76				
EC5	Between Groups	4.993	2	2.497	2.461	.092	1.1
	Within Groups	75.085	74	1.015			
	Total	80.078	76				
EC6	Between Groups	1.465	2	.732	1.134	.327	1.3
	Within Groups	47.782	74	.646			
	Total	49.247	76				
EC7	Between Groups	.757	2	.379	.500	.609	1.2
	Within Groups	56.048	74	.757			
	Total	56.805	76				
EC8	Between Groups	2.335	2	1.168	1.476	.235	1.4
	Within Groups	58.548	74	.791			
	Total	60.883	76				

Table 5.6 shows the result of one-way ANOVA analysis for risk factors related to E-Commerce. Likewise, the critical value of F for $df_1 = 2$ and $df_2 = 74$ is equal to 3.12 and where F is greater than 3.12 the Null hypothesis is rejected. No rejection to H_{E0} by all EC risk factors.

6. Electronic Collaboration (e-Collaboration):

The e-Collaboration module is nine factors that are tested against the three categories (1) Years of experiences, (2) Position, and (3) Location. The hypotheses adopted to be tested one-way ANOVA are as follow:

H_{F0} : ($p > 0.05$) – There is no significant difference between the respondents rating of the Electronic Collaboration (COL) on the performance of e-Business.

H_{F1} : ($p < 0.05$) – There is significant difference in the respondents rating of the Electronic Collaboration (COL) on the performance of e-Business (At least one group is significantly different from others).

The result of one-way ANOVA analysis for risk factors related to Electronic Collaboration was shown in Table 5.7. Same, the critical value of F for $df_1 = 2$ and $df_2 = 74$ is equal to 3.12 and where F is greater than 3.12 the Null hypothesis is rejected. No rejection to H_{F0} by all e-Collaboration risk factors.

TABLE 5.7: E-COLLABORATION MODULE ANOVA ANALYSIS

		Sum of Squares	df	Mean Square	F	Sig.	Assumption4
COL1	Between Groups	3.158	2	1.579	1.893	.158	1.4
	Within Groups	61.725	74	.834			
	Total	64.883	76				
COL2	Between Groups	2.896	2	1.448	1.985	.145	1.5
	Within Groups	53.987	74	.730			
	Total	56.883	76				
COL3	Between Groups	.939	2	.470	.846	.433	1.1
	Within Groups	41.061	74	.555			
	Total	42.000	76				
COL4	Between Groups	.467	2	.233	.285	.753	1.6
	Within Groups	60.521	74	.818			
	Total	60.987	76				
COL5	Between Groups	.520	2	.260	.306	.737	1.5
	Within Groups	62.934	74	.850			
	Total	63.455	76				
COL6	Between Groups	.495	2	.248	.291	.749	1.2
	Within Groups	63.037	74	.852			
	Total	63.532	76				
COL7	Between Groups	.406	2	.203	.246	.782	1.1
	Within Groups	61.022	74	.825			
	Total	61.429	76				
COL8	Between Groups	.600	2	.300	.350	.706	1.1
	Within Groups	63.400	74	.857			
	Total	64.000	76				
COL9	Between Groups	.615	2	.308	.352	.704	1.3
	Within Groups	64.658	74	.874			
	Total	65.273	76				

5.4.3 Position Group

The one-way procedure applied for the position group give 12 risk factors that rejected the null hypotheses ($p < 0.05$) such as 5 factors from SCM module (SCM1: 0.02, SCM4: 0.036, SCM6: 0.012, SCM7: 0.007, and SCM9: 0.032), 3 factors belonging to ERP module (ERP1: 0.03, ERP4: 0.014, and ERP7: 0.037), 2 factors associated with e-commerce module (EC3: 0.016 and EC4: 0.49), and 2 factors that belong to e-Collaboration (COL6: 0.009 and COL8: 0.047). Nevertheless, just for space and content concern, only the 12 factors that show significant difference will be off in Table 5.8.

5.4.4 Location Group

For the location group which is composed of MENA and Other subset, the one-way test output indicate that all the 49 risk factors does not reject the null hypotheses ($p < 0.05$) which means that there is no significant difference between the respondents rating of the risk factors for the performance of e-Business from MENA or another region as shown in Table 5.10 in Appendix B section.

5.5 Post Hoc Multiple Comparison

From the above tables, the one-way ANOVA analysis displays enough indication to be confident that the rating for e-Business factors by a group does not differ significantly from other. Nevertheless, three-Business risk factors, named BI2, BI7, and CRM6, show a significant difference between different groups. No information is given from the table 5.2 and 5.3 related to which group is different to the others. To solve this issue, we need to use the Tukey test as a Post Hoc Multiple Comparison Test via SPSS.

The tables 5.8-5.9-5.10 illustrate the significant values of $p < 0.05$, which indicate that there are no significant variances among the items listed in the same subset. Conversely, the items listed in different subset are considerably different for instance, in Table 5.8, the risk factor BI2 is significantly different among "15 years and more" and "6 – 14 years" on the other hand is not significantly different among "Less than 6 years" and "15 years and more" or "6 – 14 years".

To summarize, the H_{X0} ($p > 0.05$) – Null Hypothesis – There is no significant difference between the respondents for e-Business risk factors has been rejected for all risk factors except 3 factors

named BI2, BI7 and CRM6 based on the Independent variable Experience, and 12 factors based on the independent variable respondent's position. Appendix B shows the full Post Hoc data.

TABLE 5.8: POST HOC TEST FOR THE FACTOR BI2

EXP_3GROUP	N	Subset for alpha = 0.05	
		1	2
Less than 6 years	30	3.70	
15 Years and more	26	4.19	4.19
6 - 14 Years	21		4.48
Sig.		.235	.613

TABLE 5.9: POST HOC TEST FOR THE FACTOR BI7

EXP_3GROUP	N	Subset for alpha = 0.05	
		1	2
15 Years and more	26	3.69	
Less than 6 years	30	3.83	3.83
6 - 14 Years	21		4.33
Sig.		.840	.120

TABLE 5.10: POST HOC TEST FOR THE FACTOR CRM6

EXP_3GROUP	N	Subset for alpha = 0.05	
		1	2
15 Years and more	26	3.42	
Less than 6 years	30	3.93	3.93
6 - 14 Years	21		4.14
Sig.		.112	.684

5.6 Summary

It has been examined that the majority of risk factors are perceived with no differences between multiple independent subsets such as respondents' years of experience, position and especially the location. However, fifteen risk factors show significant difference among the different groups which permit to investigate more in depth in those cases. The variances of risk factors' perceptions require for better-quality communications and collaboration to improve a common understanding of e-Business risks. Besides, it might add value to compare with the ranking factors analysed in the precedent chapter to grasp the importance and real challenge that face the practitioners in the course of e-Business implementation and performance. Further discussions about that will follow in the next chapter.

CHAPTER 6 FACTORS ANALYSIS OF E-BUSINESS' RISK

6.1 Introduction

Several research studies have been done about e-Business and its adoption, critical successful and failures factors, and risks factors. Fraud, customer's relationship, business vision, scope and requirements, information security, and also financial and technological resources are the main sources of the problems and failures in e-Business.

A lack of understanding, identifying and managing these risks is frequently referred to as the critical failure factor in e-Business.

In this chapter, a principal component analysis (PCA) will be conducted based on the data set collected through the questionnaire. The results of the PCA will show a reduced number of risks elements that represent the whole initial 49 risk elements. Ultimately, a more compact, practical, and the most significant list of risk elements will be very helpful and great contributor to the understanding of the e-Business risks.

6.2 Factor Analysis

The use of factor analysis helps to reduce and representing the initial large number of factors to a small number of factors. A neglected portion of the information from the initial variables will be lost as a result of a variables' reduction through a factor analysis method. Working with a large number of variables could be problematic to deal and comprehend the data (Morgan et al. 2004; Punch 2005).

To accomplish a factor analysis, the principal components analysis is selected with varimax rotation. The principal component analysis can be used in different ways, to test the hypothesis, to examine construct, to reduce and simplify a large set of variables to a small set of components, and to inspect and learn the shape of inter relationships amongst variables also called an exploratory factor analysis (Rummel 1988).

6.3 Factor Analysis Process

Using IBM SPSS Statistics and MS Excel to analyze the data, through the principal component analysis statistical method we extracted the latent variables and subsequently reduced the initial large number of factors to a squeezed number of components without losing and compromising too much of the initial data. The initial step of the principal component analysis is to investigate and find the strong correlations between the variables.

A series of the matrix and statistical tables are produced like'' correlation matrix, KMO & Bartlett's test, total variance explained, and scree plot as well as a Rotated components matrix which shows for each component the variables that have higher influences. Bellow, Figure 6.1 draws the main stages of the factor reduction analysis' process. The 49 risks factors were reduced to 10 components through principal component analysis.

The next section will explain in more details the process, results, and discussions of the data analysis.

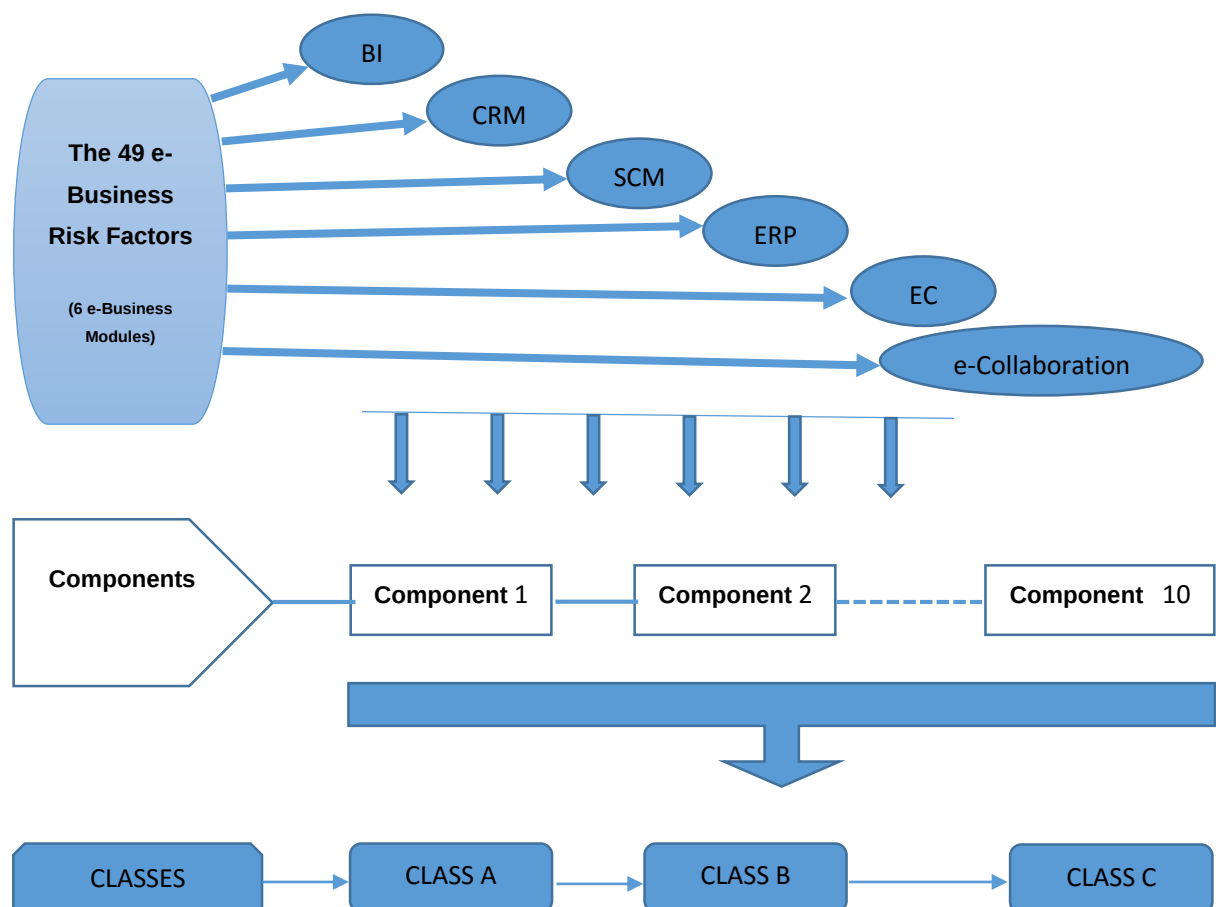


FIGURE 6.1. FACTOR REDUCTION ANALYSIS' PROCESS

6.4 Analysis of the Results

6.4.1 KMO & Bartlett Test

To conduct a principal component analysis, we tested the existence of multicollinearity or relationship between the risk factors by using IBM SPSS; The Kaiser-Meyer-Olkin (KMO) statistic is a measure of sampling adequacy, for each variable and the overall too. The KMO values fluctuate between 0 and 1, and values closer to 1 are better, in general, a value of 0.6 is recommended as a minimum (Kaiser 1970). Also, we did a check-up that we have redundancy among risk factors through Bartlett Test of Sphericity. Table 5.1 below shows the details results.

The KMO values are greater than 0.79 which is considered as a great value to measure sampling adequacy, and the factor analysis is expected to be suitable. Additionally, Bartlett's measure test the null hypothesis ($p \leq 0.05$) to check if the initial correlation matrix is an identity matrix. In our case, we need to reject the null hypothesis which tends to reveal that our risk factors are correlating among each other telling us that there is a common ground in clarifying the construct.

TABLE 6.1: KMO + BARTLETT TEST

e-Business Modules	KMO	Bartlett test
Business Intelligence (BI)	0.795	0.000
Customer relationship management (CRM)	0.857	0.000
Supply Chain Management (SCM)	0.879	0.000
Enterprise Resource Planning (ERP)	0.820	0.000
e-Commerce (EC)	0.794	0.000
Electronic Collaboration (e-Collaboration)	0.846	0.000
All e-Business	0.833	0.000

For all the e-Business modules the null hypothesis is rejected since $p < 0.001$, even for the global e-Business is highly significant. Moreover, based on the results above, both KMO and Bartlett test proved that we can consider that the model is suitable to conduct principal component analysis (PCA).

6.4.2 Total Variance Explained

The Table 6.2 "total variance explained" below, shows the factors (components) ordered by the significance of the correlations with the other factors (Full data available in Appendix C). The first section, labelled Initial Eigenvalues, of Table 6.2 contains 3 columns (Total,% of Variance and Cumulative %), where the total indicate the Eigen where when its value is bigger than one it shows that the factors are evaluating only one principal concept of the correlation matrix. Note that the total of Eigenvalues is identical to the number of the initial factors, in our study, 49. The second field, named % of Variance is the percent that represent the correlation with the other variables, which indicate that if all suggested factors for a construct are selected to be one item in the principal component analysis with an eigenvalue above one, the percentage connected to it explains how much variance is explained by all the factors unified in one component. Moreover, the greater the percentage of variance a suggested model arrives to explain, the better the model's validity. To conduct a principal component analysis, the factors with Eigen values less than one will be omitted (Punch 2005).

From Table 6.2, we can easily see that only 10 components have their Eigen values bigger than one, and the first component has 21.242 as Eigen value, the percentage of variance equal to 43.351%. Furthermore, the total (cumulative % column) percentage into of the first 10 components represents 76.94% of the entire variance. Consequently, the 49 risk elements developed in this research will be represented by 10 components.

[illegible]

Extraction Method: Principal Component Analysis.

6.4.3 Scree Plot

Similarly, the scree plot is a valuable graphic assistance that helps to set a suitable number of components as shown below in Figure 6.2.

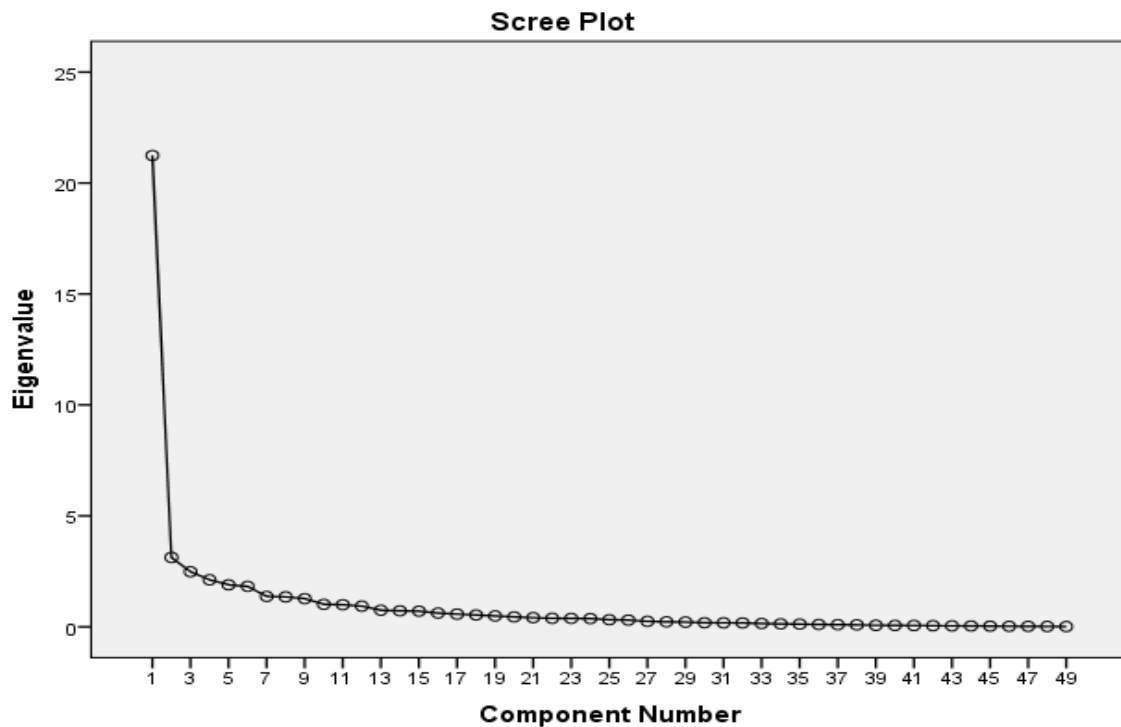


FIGURE 6.2: SCREE PLOT OF E-BUSINESS RISK FACTORS

The scree plot displays the eigenvalue in the axis "Ordinate" and the component number in the axis "Abcissa." To decide the right number of components, we just have to look at the slope where the Eigen values go below 1 and the curve of scree become parallel with the x-axis (Abcissa). Therefore, 10 components are selected for the principal component analysis (PCA).

6.4.4 Rotated Component Matrix

Next, we will present the rotated component matrix (see below Table 6.3) that help to find out which e-Business risk factors are having the biggest negative impact on the online business. The Tables 6.3 describe the rotated component matrix; it shows the amount of impact of every risk element in the whole survey, and the ones with high influence are highlighted. Most variables show high numbers on the most significant factors and fewer numbers of other factors.

TABLE 6.3: ROTATED COMPONENT MATRIX FOR E-BUSINESS RISKS

	Component									
	1	2	3	4	5	6	7	8	9	10
COL8	.747									
COL3	.730									
COL2	.702									
COL7	.671									
COL5	.627									
COL6	.621									
COL9	.620									
COL1	.606									
COL4	.579									
EC6	.525									
CRM4		.814								
CRM3		.749								
SCM6		.716								
ERP1		.661								
SCM3		.553								
ERP7		.512								
SCM4		.511								
CRM8		.456								
BI7			.834							
CRM6			.727							
ERP6			.667							
ERP2			.544							
BI1			.482							
EC2				.741						
EC1				.670						
EC3				.597						
BI5				.503						
BI4					.784					
BI3					.769					
BI2					.623					
CRM5						.652				
SCM9						.630				
BI6						.565				
EC8						.502				
ERP8						.488				
SCM7							.663			
SCM5							.627			
SCM1							.575			
CRM2							.512			
CRM1							.471			
SCM8								.700		
EC7								.673		
SCM2								.614		
ERP4									.804	
ERP5									.626	
ERP3									.499	
EC5										.617
EC4										.468
CRM7										.467

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 15 iterations.

Also, the table comprises the rotated factor loadings, which symbolize the relationship between the factor and the variables. Moreover, the values are in the ranges of $[-1, 1]$ since the variables are weighted and correlated, and the number bigger than 0.4 are highly suggested to take in consideration for factor loadings.

By looking at Table 6.3, the risk factor "COL 1" has a big impact on component 1 (0.747) but very little to the rest of components. While, for instance, the risk factor "CRM4" has got a greater impact on component 2 with a value of 0.814, and "BI7" got the biggest influence on component 3. In summary, we can see that component 1 regroup 10 factors (9 initial e-Collaboration risk module and "EC6"), the second component regroups 8 factors (3 factors from CRM and BI, and 2 from ERP), the remaining components are summarized and shown in Table 6.4 below.

6.4.5 Extraction of common themes

In this step, the risk factors that are regrouped in components with the most influence. The 49 risk factors are reduced to 10 components by applying principal component analysis. Table 6.3 shows the 10 components with a new shared subjects as an identifier to the component. Next, the percentage variance of every group of factors is taken from Table 6.2. Also, the initial factors with their code, and the factor loading score are mentioned.

TABLE 6.4: COMPONENTS FOR E-BUSINESS RISK

Components	Initial Eigenvalues: Total	Extr. Sums of Squared Loadings : Var %	Rotation sum of squared loadings: Var %	Factor loading score	e-Business Risk grouped to component	
Component 1 Collaboration	21.2	43.351	14.7	.747 .730 .702 .671 .627 .621 .620 .606 .579 .525	COL8 COL3 COL2 COL7 COL5 COL6 COL9 COL1 COL4 EC6	1. Lack of trust between your organization and merchant or customer 2. Managerial obstacles 3. Technology unreadiness 4. Lack of expertise and experience 5. e-mail security system and cost related 6. Information security risks 7. Partners may be using different platforms and a variety of data formats 8. Unavailability of bandwidth 9. Financial and technological resources limitation 10. Lack of ICT knowledge and skills
Component 2 Customer Oriented & Knowledge Experience	3.1	6.381	10.3	.814 .749 .716 .661 .553 .512 .511 .456	CRM4 CRM3 SCM6 ERP1 SCM3 ERP7 SCM4 CRM8	1. Lack of cooperation in different parts (Reluctance to share their data towards others) 2. Lack of customer-oriented culture 3. Lack of expertise and experience 4. Insufficient training and re-skilling 5. Stock obsolescence 6. Lack of expertise and experience 7. Working with unknown suppliers 8. Lack of trust between your organization and merchant or customer
Component 3 Data quality and Governance	2.5	5.067	7.8	.834 .727 .667 .544 .482	BI7 CRM6 ERP6 ERP2 BI1	1. Sustainable data quality and governance framework 2. Sustainable data quality and governance framework 3. Sustainable data quality and governance framework 4. Lack of integration between enterprise-wide systems or other vendors systems 5. Passive role in leadership and management from top management
Component 4 e-Commerce	2.1	4.324	7.6	.741 .670 .597 .503	EC2 EC1 EC3 BI5	1. Unavailability of e-Payment methods 2. e-Payment fraud (credit card, bank transfer, PayPal, 3. Angry customer posting negative comments online 4. Misunderstanding requirements and frequent changes demanded by end users
Component 5 Strategy & PM	1.9	3.868	7.2	.784 .769 .623	BI4 BI3 BI2	1. Unbalanced project team composition 2. Poor project management 3. Unclear business vision and unsettled business case
Component 6 Information Security	1.9	3.723	7.2	.652 .630 .565 .502 .488	CRM5 SCM9 BI6 EC8 ERP8	1. Information security risks 2. Information security risks 3. Information security risks 4. Information security risks 5. Information security risks
Component 7 External relationship management	1.4	2.798	6.4	.663 .627 .575 .512 .471	SCM7 SCM5 SCM1 CRM2 CRM1	1. Lack of trust between your organization and merchant or customer 2. Sustainable data quality and governance framework 3. Confidential data leaked to a competitor 4. Weakness in the relationship with the customers 5. Customer service failures
Component 8 Legal	1.3	2.758	5.7	.700 .673 .614	SCM8 EC7 SCM2	1. Partners may be using different platforms and a variety of data formats 2. Immaturity of online laws 3. Immaturity of online laws
Component 9 ERP implementation	1.8	2.595	5.5	.804 .626 .499	ERP4 ERP5 ERP3	1. Complexities of ERP systems 2. Failure to support cross-organization design 3. Failure to manage end user expectations
Component 10 Financial	1.0	2.072	4.1	.617 .468 .467	EC5 EC4 CRM7	1. High financial costs 2. Difficulty to attract courier services (FedEx, UPS, ...) to provide delivery services 3. Lack of expertise and experience

6.4.6 Components' Reliability Test

After the principal component analysis, a reliability test (Cronbach's alpha) was conducted against the resulting 10 components to investigate the consistency among respondents and examine the internal uniformity. Table 6.5 shows the Alpha values of the 10 components where the smallest Cronbach's alpha value measured was 0.765 (Component 10), and the largest one was 0.925 (Component 1). Hence, it is confident to say that the scale was reliable. Moreover, the Alpha value for the aggregated 10 components scale is equal to 0.918 which allow stating that the scale has significantly high consistency. Note that a value of 0.6 is recommended as a minimum.

TABLE 6.5. CRONBACH ALPHA TEST OF RELIABILITY OF THE 10 COMPONENTS

Component	Cronbach Alpha	N of Items
Component 1	0.925	10
Component 2	0.905	8
Component 3	0.846	5
Component 4	0.825	4
Component 5	0.901	3
Component 6	0.880	5
Component 7	0.890	5
Component 8	0.805	3
Component 9	0.761	3
Component 10	0.756	3
All e-Business	0.918	49

6.5 Grouping risk factors in Classes

The process of reducing the risk factors from the initial 49 risk elements to 10 components via the principal component analysis, and followed by the aggregation of the 10 components to 3 compact classes that have some common themes. Each class gets a calculated cumulative percentage based on the percentage of variance of the components that belong to it as it is mentioned in Table 6.3.

TABLE 6.6: NEW CLASSIFICATION OF E-BUSINESS RISK

CLASS	Component	% variance	Code	Main risk factors	Total % variance
CLASS A Experience and Knowledge	Component 2	6.4	CRM4 CRM3 SCM6 ERP1 SCM3 ERP7 SCM4 CRM8	Lack of cooperation in different parts (Reluctance to share their data) Lack of customer-oriented culture Lack of expertise and experience Insufficient training and re-skilling Stock obsolescence Working with unknown suppliers Lack of trust between your organization and merchant or customer	9 %
	Component 9	2.6	ERP4 ERP5 ERP3	Complexities of ERP systems Failure to support cross-organization design Failure to manage end user expectations	
CLASS B Technology and Security	Component 1	43.4	COL8 COL3 COL2 COL7 COL5 COL6 COL9 COL1 COL4 EC6	Lack of trust between your organization and merchant or customer Managerial obstacles Technology un-readiness Lack of expertise and experience e-mail security system and cost related Information security risks Partners may be using different platforms and a variety of data formats Unavailability of bandwidth Financial and technological resources limitation Lack of ICT knowledge and skills	54.2 %
	Component 4	4.3	EC2 EC1 EC3 BI5	Unavailability of e-Payment methods e-Payment fraud (credit card, bank transfer, PayPal, Angry customer posting negative comments online Misunderstanding requirements and frequent changes demanded by end users	
	Component 6	3.7	CRM5 SCM9 BI6 EC8 ERP8	Information security risks	
	Component 7	2.8	SCM7 SCM5 SCM1 CRM2 CRM1	Lack of trust between your organization and merchant or customer Sustainable data quality and governance framework Confidential data leaked to a competitor Weakness in the relationship with the customers Customer service failures	
CLASS C Strategy, Governance and Management	Component 3	5.1	BI7 CRM6 ERP6 ERP2 BI1	Sustainable data quality and governance framework Lack of integration between enterprise-wide systems or other vendors systems Passive role in leadership and management from top management	10 %
	Component 8	2.8	SCM8 EC7 SCM2	Partners may be using different platforms and a variety of data formats Immaturity of online laws	
	Component 10	2.1	EC5 EC4 CRM7	High financial costs Difficulty to attract courier services (FedEx, UPS, ...) to provide delivery services Lack of expertise and experience	

Note: Factors of component 5 are spread out on different classes

The exploration displays 3 main classes that look reliable and which we label:

- **Class A:** Experience and Knowledge.
- **Class B:** Technology and Security.
- **Class C:** Strategy, Governance and Management.

The new classes for the e-Business' risk factors are presented below in Table 6.6:

Class A includes two components, the component 2 and 9 which embody 9% of the total variance explained. A total of 11 risk factors fit in this class that involves the knowledge and the experience in the e-Business domain. It is obvious that such factors have a crucial importance and a big influence on the outcome of the e-Business activities performance. Without any doubt, any company trying to implement present has no chance to survive if those factors are not taken into consideration. Moreover, one of the main barrier to entry to e-Business that faces entrepreneur or "brick-and-mortar" firm is the lack of knowledge and expertise.

Class B is defined as 'Technology and Security' and consist of four components, such as component 1, component 4, component 6, and component 7 and have the highest total variance explained equally to 54.2%. It englobes 24 risk factors which are related to technology and security. No need to stress the importance of this class since it is a commonly known information that technology and security are a two pillar in the realm of e-Business. Obsolete technology will drive to e-Business failure, and a weaken security environment threatens the whole e-Business performance. Nowadays, some factors included in the components belonging to class B are compulsory for the e-Business and account for high criticality, for instance, the factor "Unavailability of bandwidth" will put the firm offline and in a non-operational mode which will destroy the firm financially and damage its reputation.

Class C consist of three components, named component 3, component 8, and component 10, and account for 10% of the total variance explained. The class has been named "Strategy, Governance and Management" which give an insight of the prominence of the 11 factors that compose this class. The strategy is one of the fundamental pillars of any business whatsoever his nature or industry acting, and in e-Business domain, the competition emphasises more in the level of the strategic more than the tactical. Besides, good management and governance availability are mandatory for the emergence of e-Business performance. The factor "Passive role in leadership and management from top management" with the code "BI1" has a negative

impact on any e-Business firm by breaking the firm's structure, fogging its vision and slowing down the speed of the e-Business performance.

To summarize, the three classes could be seen as three pillars that bear the e-Business and might be perceived as the vital components to any successful e-Business firm. Below Figure 6.3 displayed the output of the new classification.

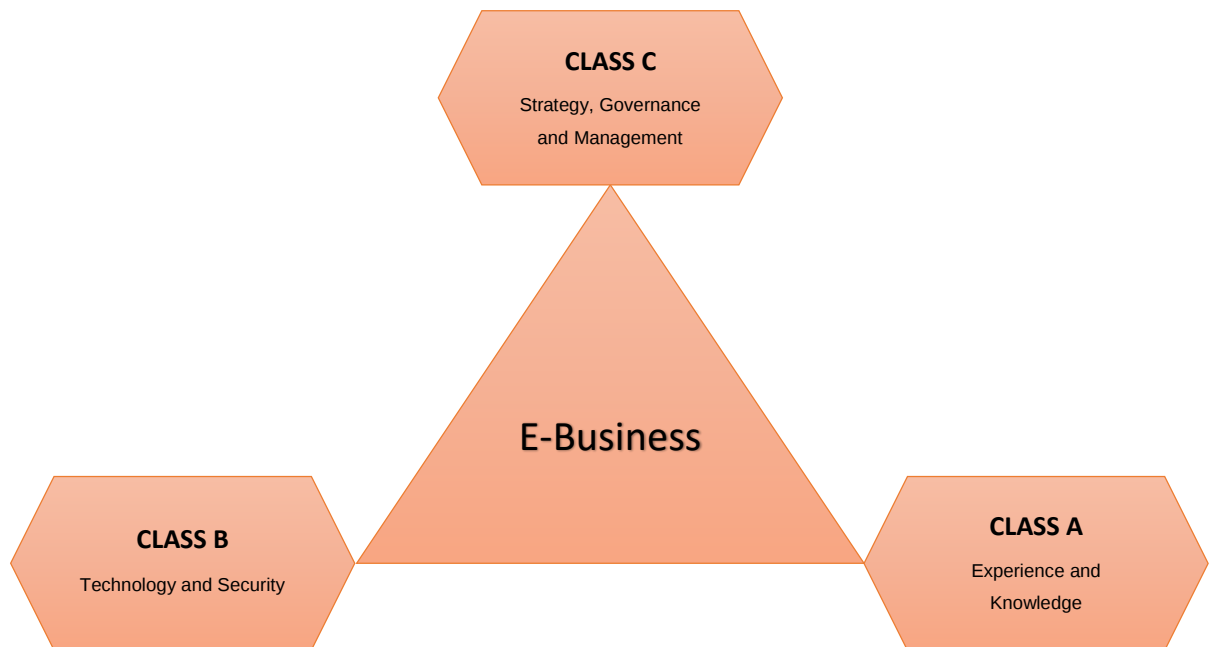


FIGURE 6.3. THE THREE PILLARS

6.6 Classes' Reliability Test

After the extraction of the three classes, a reliability test (Cronbach's alpha) was conducted for 3 classes to inspect the consistency between respondents and examine the internal uniformity.

TABLE 6.7. CRONBACH ALPHA TEST OF RELIABILITY OF THE 3 CLASSES

Classes	Cronbach Alpha	N of Items
CLASS A	0.903	13
CLASS B	0.939	19
CLASS C	0.902	13
All e-Business	0.918	45

Table 6.7 above shows the Alpha values of the 3 classes where all the values are higher than 0.6, consequently designating that the scale is internally reliable. Furthermore, the alpha value for the aggregated 3 classes scale is equal to 0.918 which allow stating that the scale has significantly high consistency. Note that a value of 0.6 is recommended as a minimum.

6.7 Summary

The factor analysis (principal component analysis) allows us to reduce the 49 risk elements to 10 components without losing too much information. From the results shown in Table 6.2, the assemblage of factors counts a cumulative percentage of variance of 77% for the negative influence of risks in e-Business. As a matter of fact, merely 23% of the data is reduced via the principal component analysis process.

TABLE 6.8. STATISTICAL TEST RESULTS

Statistical Test	Value
KMO	0.833
Bartlett test	0.000
Scree plot	10
Percentage of variance	77%
Cronbach Alpha	0.918

In this research, several risks and factors in the context of e-Business have been identified, assessed through questionnaire and finally analyzed via different statistical test. Seeing that these were questionnaires answers from experienced practitioners' permits an up till now unreported viewpoint which could add be a great add value to businesses, entrepreneurs, and academics involved with online business and e-Business.

The Study has identified 10 principal components of risk for e-Business. The 10 principal components and their Cronbach's alpha, KMO & Bartlett test, and the percentage of variance were exposed in Table 6.8 shown above. Additionally, based on the results from Table 6.3, the new classes have a total percentage of variance about 73.2% for the influence and impact of risk factors on e-Business performance as shown below in Table 6.9.

TABLE 6.9: PERCENTAGE OF VARIANCE FOR CLASSES

Class Name	% Total Variance
CLASS A: Experience and Knowledge	9%
CLASS B: Technology and Security	54.2%
CLASS C: Strategy, Governance and Management	10%

In practice, practitioners in e-Business might face all the 49 risk factors that were part of these study as initial risk factors; some of them are candidate threat with for impact and high probability to occur or less occurrence's probability but high impact, or inversely. The practitioner could get an insight from this study to help prioritize the e-Business risk and assign a correct probability of occurrence as well as the significance of the risk impact.

7.1 Introduction

The principal goals of this research were to identify the key risk factors that influence negatively on e-Business performance, contained by the six modules that represent the core e-Business processes and mechanisms. This chapter provides a discussion of the different themes listed and testified throughout this study. A discussion of the findings covers the e-Business risk ranking, hypothesizes testing, and the factors analysis results. Then, a research Implications and contributions were presented. Finally, the chapter last with a conclusion about the research.

7.2 Discussion of the Findings

In this section, we will discuss the research findings related to e-Business risk factors ranking, hypothesis testing, and the e-Business risk factors analysis.

7.2.1 Ranking

In chapter four, we presented an overall ranking for the 49 e-Business risk factors, the severity index, and the mean. The average for every e-Business module was calculated and the respondents' position, region, and number of years' experience ranking. The top three ranked risk factors were "e-Payment fraud" with the severity index equal to 83.6%, the same result found by Liebermann & Stashevsky (2002) and Grant et al. (2014), where "Internet credit card stealing" ranked first. Also, according to Trautman (2015), several financials regulations in various jurisdictions, consider enforcing new identity verification requirements on banks and payment processors institutions to decrease online fraud. The second risk ranked is "Weakness in the relationship with customers" with the severity index equal to 82.3% and is perceived as an important e-Business risk factor by practitioners as stressed by Sourizaei et al. (2011), where well-intentioned and conscious managers must be carefully selected to build a strong common relationship with the customer, and sufficient and suitable capital must be allocated in this concern. Besides, Scott (2004) indicated the importance to lock-in with the customer by increasing the switching costs. The "Unclear business vision and unsettled business case" as the

third e-Business factor with the severity index equal to 82.3%, shows the significance of the alignment between the business case and the vision. This view is supported by Yeoh & Popovic (2015) study's results that point out that the five best effective case studies strictly aligned their business cases with their business vision.

Furthermore, the results show that CRM is perceived as the riskier e-Business module with overall average equal to 79.1%. The same result comes from respondent outside the MENA region, IT Staff, Management position, and 'Less than six years' experience in e-Business. The respondents from MENA region, 'Fifteen years and more' experience, and 'Other' position believe that the riskier is e-Collaboration module. Only the respondents with '6 to 14 Years' rated BI as the riskier e-Business module.

The Kendall's Tau-b Rank Correlation Test confirms the disagreement between the respondents' experience groups where it might be explained as the respondents get more e-Business years' experience, the e-Business risk perception might change. Grant et al. (2014) found the same correlation and explained it as a pseudo-linear relationship among respondents' experience and risk perception. Also, the Kendall' test validates the agreement among the management position and the two other position ("IT Staff" and "Others"), It might be seen by the capability of the "Management" position to deal with multiple perspectives related to e-Business risks. This result was confirmed partially by Grant et al. (2014) study, where IT Staff respondents perceived staff's threats as higher risk comparing to the managers' position and owners, they explained it to the managers and owners positions don't possess the appropriate e-Business risk knowledge or it might be the complexity of e-Business' technology. Lastly, the "MENA" and "Other Region" groups have shown agreement in ranking the e-Business risk factors between them.

7.2.2 Hypothesis's Testing

One-way ANOVA analysis was used to test the degree to which two or more groups experiment's differences and the test was done against three independent variables; 1) Respondents' e-Business experience, 2) Respondents' position, and 3) Respondents' region. For every e-Business module, we set the hypotheses for testing. First, the Business Intelligence (BI) e-Business module (one component out of the six e-Business modules), for instance, we used the following hypotheses take on to be tested one-way ANOVA are as follow:

$H_0: (p > 0.05)$ – There is no significant difference between the respondents rating of the Business Intelligence (BI) on the performance of e-Business.

H₁: ($p < 0.05$) – There is significant difference in the respondents rating of the Business Intelligence (BI) on the performance of e-Business (At least one group is significantly different from others).

For the respondent's experience groups, only three risk factors that rejected the null hypotheses ($p < 0.05$) such as BI2, BI7, and CRM6 which means there is a significant difference at least between two groups. This result align with the output from the Kendall's Test presented in the previous section (7.2.1 Ranking), where the Kendall's Test confirms the disagreement between the respondents' experience groups.

The second independent variable (position) shows that 12 out of 49 risk factors rejected the null hypothesis that there is a significant difference among the respondents' position groups and at least one group is significantly different from others. The 12 factors are distributed among the six e-Business modules as follow: 5 factors from SCM module (SCM1: 0.02, SCM4: 0.036, SCM6: 0.012, SCM7: 0.007, and SCM9: 0.032), 3 factors belonging to ERP module (ERP1: 0.03, ERP4: 0.014, and ERP7: 0.037), 2 factors associated with e-commerce module (EC3: 0.016 and EC4: 0.49), and 2 factors that belong to e-Collaboration (COL6: 0.009 and COL8: 0.047). A large number of factors from SCM might be explained by only 26% from the respondents possess SCM e-Business experience as shown in Table 4.2 (Chapter 4 – Descriptive Analysis).

For the respondents' region groups which is having only two subsets group: MENA and Other, the one-way ANOVA test result shows that all the 49 risk factors does not reject the null hypotheses ($p < 0.05$) which means that there is no significant difference between the respondents rating of the risk factors for the performance of e-Business from MENA or another region. Again Kendall's test confirms the same result as stated previously (7.2.1 Ranking).

To summarize, it has been statistically tested that the majority of risk factors are perceived with no differences between multiple independents groups such as respondents' years of experience, position, and the region. Nevertheless, fifteen risk factors display significant difference among different groups which might need a more in-depth investigation in those cases. The variances of risk factors perceptions need a better communications and a high-quality collaboration to increase a communal understanding of e-Business risks factors.

7.2.3 Factors Analysis

In this study, the process of decreasing the risk factors from 49 risk elements to 10 components through the PCA, and through the aggregation of the 10 components which emerge 3 compact classes that have some common themes.

The following shows the 3 main classes that look reliable and which we label:

- Class A: Experience and Knowledge.
- Class B: Technology and Security.
- Class C: Strategy, Governance, and Management.

This result is consistent with Feindt et al. (2002) where they identify two out three common factors like the knowledge and management's experience and the innovation in technology. In another hand, Jeon et al. (2006) classed “employees’ knowledge” and “e-Business technology” as two sub category under the main Organizational class.

Class A includes two components, the component 2 and 9 which embody 9% of the total variance explained. A total of 11 risk factors fit in this class that involves the knowledge and the experience in the e-Business domain. It is obvious that such factors have a vital importance and a big influence on the outcome of the e-Business. Certainly, any firm trying to implement e-Business has no chance to survive if those factors are not taken into consideration. Furthermore, one of the main barrier to entry to e-Business is the lack of knowledge and expertise. Several studies highlighted this point like (Grant et al. 2014; Hussain & Subramoniam n.d.; Jeon et al. 2006; Olszak 2016; Rahayu & Day 2015; Yeoh & Popovic 2015)

For the Class B, ‘Technology and Security,’ which consist of four components and have the highest total variance explained equally to 54.2%. It englobes 24 risk factors which are related to technology and security. No need to stress the importance of this class since it is a commonly known information that technology and security are a two pillar in the realm of e-Business (Kim et al. 2015; Rahayu & Day 2015; Sung 2006). Obsolete technology will drive to e-Business failure, and a weaken security environment threatens the whole e-Business performance. These days, some factors included in the components belonging to class B are necessary for the e-Business and account for high criticality, for instance, the factor "Unavailability of bandwidth" will put the firm offline and in non-operational status which will destroy the firm financially and

damage its reputation. This result is consistent with previous studies (Kshetri 2007; Srinivasan & Abi-raad 2003)

Class C consist of three components, named component 3, component 8, and component 10, and account for 10% of the total variance explained. The class has been named "Strategy, Governance and Management" which give an insight of the prominence of the 11 factors that compose this class. The strategy is one of the major pillar of any business whatsoever his nature or industry acting and in e-Business domain the competition emphasis more in the level of the strategic more than the tactical. Our finding is consistent with Scott (2004), where he stresses the importance of strategic e-Business risk where the negligence might put the firm in weakening non-competitive position.

Also, good management and governance availability are required for the development of e-Business performance. The factor "Passive role in leadership and management from top management" has a negative influence in any e-Business firm by breaking the firm's structure, fogginess its vision and slow down the speed of the e-Business performance. Many studies support this finding where the high support and leadership from top management play a crucial role for e-Business firms to survive and stay competitive (Olszak 2016; Yeoh & Popovic 2015). To conclude, the three classes might be perceived as three pillars that bear the e-Business and could be perceived as the vital components to any successful e-Business firm.

7.3 Research Implications

The results of this study will have implications for e-Businesses firms. E-Business' management could take this study as an e-Business risk benchmark to compare against competitors or new business areas to be investigated. Also, the research gives and helps the management of e-Business' firms the ability to pursue the appropriate and more significant risks. Also, they can take into consideration the three classes proposed to more concentrate on the critical e-Business common areas like Knowledge and Experience, Technology and Security, and Strategy.

The research, from an academic perception, might contribute some improvement in clarifying the most important e-Business risk factors across the new e-Business framework which is a theoretical model that the study proposes. There are chances for new studies based on the several e-Business risk factors cited and categorized in this study.

7.4 Research Contributions

As explicated in the preceding chapters, the present study relates to the shortage of agreed e-Business risk construct and their association with different e-Business modules that constitutes the key components of e-Business core activities and processes. The six e-Business modules framework proposed in this research with its risk construct were a contribution that search for addressing these insufficiencies. Several risk factors are identified, rated, and ranked within the six key e-Business risk areas.

Additionally, the study was able to give an indication that the opinion and perception of the e-Business risk are very nearly without difference between multiple groups of respondents like practitioners' region, position, and some years of e-Business experience. The study ascertains a number restraint of risk factors as the most important e-Business risk factors that need to be taken into consideration on the journey of adopting and implementing e-Business.

Moreover, the study suggested a new classification of e-Business factors which are linked with six e-Business modules and consist of 49 risk factors that were reduced to only 10 components, where the 10 components resulted in a new 3 classes as a new e-Business risk model which is based on subjective perception of the e-Business risk elements.

Additional contributions of the study are given below:

- Gathering and extraction of more than 150 e-Business risk factors from the literature review.
- Reducing the exhaustive list of risk in 49 risk factors distributed on the six e-Business modules.
- Developing a reliable questionnaire instrument for e-Business risk module (Cronbach's $\alpha = 0.972$).
- Ranking the e-Business risk and presenting the most important risk factors.
- Differences of perceptions of e-Business risk factors in e-Business realm between the e-Business practitioners.
- Combining of 3 principal classes of e-Business risk factors via principal component analysis (PCA).

7.5 Research Conclusion

In this chapter we will conclude the whole research study. Moreover, some limitations of the research will be elucidated and the author will present several recommendations for further research related to e-Business risks.

7.5.1 Limitations of the research

The e-Business risk construct framework with its six e-business modules used in this research present a limitation in the context that not all e-Business firm or practitioners necessarily get involved with the six e-Business modules named BI, CRM, SCM, ERP, E-Commerce, and e-Collaboration, which might influence the respondent perception and risk rating. Also, there is a risk that a respondent might give imprecise answers because of impatience. Plumridge (2013) mentions that the regular attention span is around five minutes, Internet users become quickly stressed and impatient by the exhaustive information on the Internet. It is good to mention that the completion of the questionnaire might not be directly done by the practitioners themselves at least there is no way to be sure on this point.

The research did not differentiate between respondents, a clear delimitation between the respondents' position was not provided as it was trustfully left to the respondents to select the appropriate category they believe that strongly suit for them. Also, it needs to be noted that someone who is responding as "Management" could be "Entrepreneur" as well or had the previous position as "IT Staff" and vice versa.

The proposed classification by the study which consists of reducing the 10 components resulting from the PCA into only 3 key classes was based on the researcher's interpretation and his long experience on ICT and e-Business domain. Nevertheless, different classification could be produced by other researchers based on their judgement and mindset.

7.5.2 Recommendations for further research

The practitioners' e-Business experiences were the principal source for e-Business risk assessment and rating used in this study. The researcher believes that conducting a qualitative research with the same proposed e-Business framework is an informative study and a potential further research. The exploratory research will certainly help to expand the current understanding of principal causes, thoughts, and motivations.

Another potential side for further research is by considering a detailed investigation of the e-Business risk perception at the differences between two or more countries. A new potential facet for further research is to consider a specific study that focuses on SMEs only. It was not followed by this research due to the restrictions in time, albeit the data related to the size of the firm was collected through the questionnaire.

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APPENDIX A: Questionnaire



E-Business Risks Survey

Dear Respondent,

This survey is being done as a part of a Master programme study. Your responses would greatly contribute in understanding the influence of different risks associated to e-Business operations.

The findings from the survey will help in understanding how online SMEs can survive and be more effective in adopting e-business. The survey is designed for everyone who has some experience in e-business or/and academic knowledge about e-Business. You do not need to mention your name or your organization's name in the survey. The responses will be kept anonymous.

Survey Duration: 5-10 minutes

Please accept thanks and appreciation on the value of your opinions

Section One: Demographics & General Information

1. * Gender

☐ Male

☐ Female

2. * Which region do you come from?

☐ Middle East & North Africa

☐ Europe

☐ US

☐ Asia

☐ Other

3. * What is your age group?

☐ Less than 25

☐ 26 - 30

☐ 31 - 40

☐ 41 - 50

☐ 51 and more

4. * In which sector do you currently work?

☐ Government

☐ Private

☐ Semi Government

☐ Service provider

☐ Other

5. * What is the size of your company?

☐ 1 or 2 employees

☐ 3 - 9 employees

☐ 10 - 19 employees

☐ 20 - 49 employees

☐ 50 - 99 employees

☐ 100 and more employees

6. * Select your position in your organization

☐ Management

☐ Entrepreneur

☐ Consultant

☐ IT Staff

☐ Academic

☐ Other

7. * How many years of experience do you have in e-business?

☐ Less than one year

☐ 1 - 2 Years

☐ 3 - 5 Years

☐ 6 - 10 Years

☐ 11 – 14 Years

☐ 15 Years or more

Section Two: Risks associated with e-Business

8. * Which e-Business modules do you have knowledge and/or experience? (Select all that apply)

- ☐ Business Intelligence (BI)
- ☐ Customer relationship management (CRM)
- ☐ Supply Chain Management (SCM)
- ☐ Enterprise Resource Planning (ERP)
- ☐ e-Commerce (EC)
- ☐ Electronic Collaboration (e-Collaboration)

9. * How likely Business Intelligence (BI) risks will have a negative influence on the performance of the e-Business

Risks	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
1) Passive role in leadership and management from top management	☐	☐	☐	☐	☐
2) Unclear business vision and unsettled business case	☐	☐	☐	☐	☐
3) Poor project management	☐	☐	☐	☐	☐
4) Unbalanced project team composition	☐	☐	☐	☐	☐
5) Misunderstanding requirements and frequent changes demanded by end users	☐	☐	☐	☐	☐
6) Information security risks	☐	☐	☐	☐	☐
7) Sustainable data quality and governance framework	☐	☐	☐	☐	☐

10. * How likely Customer relationship management (CRM) risks will have a negative influence on the performance of the e-Business

Risks	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
8) Customer service failures	☐	☐	☐	☐	☐
9) Weakness in the relationship with the customers	☐	☐	☐	☐	☐
10) Lack of customer-oriented culture	☐	☐	☐	☐	☐
11) Lack of cooperation in different parts (Reluctance to share their data towards others)	☐	☐	☐	☐	☐
12) Information security risks	☐	☐	☐	☐	☐
13) Sustainable data quality and governance framework	☐	☐	☐	☐	☐
14) Lack of expertise and experience	☐	☐	☐	☐	☐
15) Lack of trust between your organization and merchant or customer	☐	☐	☐	☐	☐

11. * How likely Supply chain management (SCM) risks will have a negative influence on the performance of the e-Business

Risks	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
16) Confidential data leaked to a competitor	☐	☐	☐	☐	☐
17) Immaturity of online laws	☐	☐	☐	☐	☐
18) Stock obsolescence	☐	☐	☐	☐	☐
19) Working with unknown suppliers	☐	☐	☐	☐	☐
20) Sustainable data quality and governance framework	☐	☐	☐	☐	☐
21) Lack of expertise and experience	☐	☐	☐	☐	☐
22) Lack of trust between your organization and merchant or customer	☐	☐	☐	☐	☐
23) Information security risks	☐	☐	☐	☐	☐
24) Partners may be using different platforms and a variety of data formats	☐	☐	☐	☐	☐

12. * How likely Enterprise resource planning (ERP) risks will have a negative influence on the performance of the e-Business

Risks	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
25) Insufficient training and re-skilling	☐	☐	☐	☐	☐
26) Lack of integration between enterprise-wide systems or other vendors systems	☐	☐	☐	☐	☐
27) Failure to manage end user expectations	☐	☐	☐	☐	☐
28) Complexities of ERP systems	☐	☐	☐	☐	☐
29) Failure to support cross-organization design	☐	☐	☐	☐	☐
30) Sustainable data quality and governance framework	☐	☐	☐	☐	☐
31) Information security risks	☐	☐	☐	☐	☐
32) Lack of expertise or Failure to integrate with them	☐	☐	☐	☐	☐

13. * How likely E-Commerce (EC) risks will have a negative influence on the performance of the e-Business

Risks	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
33) e-Payment fraud (credit card, bank transfer, PayPal, ...)	☐	☐	☐	☐	☐
34) Unavailability of e-Payment methods	☐	☐	☐	☐	☐
35) Angry customer posting negative comments online	☐	☐	☐	☐	☐
36) Difficulty to attract courier services (FedEx, UPS, ...) to provide delivery services	☐	☐	☐	☐	☐
37) High financial costs	☐	☐	☐	☐	☐
38) Lack of ICT knowledge and skills	☐	☐	☐	☐	☐
39) Immaturity of online laws	☐	☐	☐	☐	☐
40) Information security risks	☐	☐	☐	☐	☐

14. * How likely Electronic Collaboration (e-Collaboration) risks will have a negative influence on the performance of the e-Business

Risks	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
41) Unavailability of bandwidth	☐	☐	☐	☐	☐
42) Technology un-readiness	☐	☐	☐	☐	☐
43) Managerial obstacles	☐	☐	☐	☐	☐
44) Financial and technological resources limitation	☐	☐	☐	☐	☐
45) e-mail security system and cost related	☐	☐	☐	☐	☐
46) Information security risks	☐	☐	☐	☐	☐
47) Lack of expertise and experience	☐	☐	☐	☐	☐
48) Lack of trust between your organization and merchant or customer	☐	☐	☐	☐	☐
49) Partners may be using different platforms and a variety of data formats	☐	☐	☐	☐	☐

THANK YOU

APPENDIX B: ANOVA Tables

Business Intelligence: Post Hoc Tests

(Respondents Experience)

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) EXP_3GROUP	(J) EXP_3GROUP	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
BI1	15 Years and more	6 - 14 Years	-.363	.266	.365	-1.00	.27
		Less than 6 years	.256	.243	.544	-.32	.84
		15 Years and more	.363	.266	.365	-.27	1.00
		Less than 6 years	.619*	.258	.049	.00	1.24
	6 - 14 Years	15 Years and more	-.256	.243	.544	-.84	.32
		Less than 6 years	-.619*	.258	.049	-1.24	.00
		15 Years and more	-.284	.312	.635	-1.03	.46
		Less than 6 years	.492	.285	.201	-.19	1.17
BI2	15 Years and more	6 - 14 Years	.284	.312	.635	-.46	1.03
		Less than 6 years	.776*	.302	.033	.05	1.50
		15 Years and more	-.492	.285	.201	-1.17	.19
		Less than 6 years	-.776*	.302	.033	-1.50	-.05
	6 - 14 Years	15 Years and more	-.154	.330	.887	-.94	.64
		Less than 6 years	.146	.301	.879	-.57	.87
		15 Years and more	.154	.330	.887	-.64	.94
		Less than 6 years	.300	.320	.619	-.47	1.07
BI3	15 Years and more	6 - 14 Years	-.146	.301	.879	-.87	.57
		Less than 6 years	-.300	.320	.619	-1.07	.47
		15 Years and more	-.233	.299	.718	-.95	.48
		Less than 6 years	.010	.273	.999	-.64	.66
	6 - 14 Years	15 Years and more	.233	.299	.718	-.48	.95
		Less than 6 years	.243	.290	.681	-.45	.94
		15 Years and more	-.010	.273	.999	-.66	.64
		Less than 6 years	-.243	.290	.681	-.94	.45
BI4	15 Years and more	6 - 14 Years	-.304	.248	.442	-.90	.29
		Less than 6 years	.244	.227	.533	-.30	.79
		15 Years and more	.304	.248	.442	-.29	.90
		Less than 6 years	.548	.241	.066	-.03	1.12
	6 - 14 Years	15 Years and more	-.244	.227	.533	-.79	.30
		Less than 6 years					
		15 Years and more					
		Less than 6 years					
BI5	15 Years and more	6 - 14 Years					
		Less than 6 years					
		15 Years and more					
		Less than 6 years					
	6 - 14 Years	15 Years and more					
		Less than 6 years					
		15 Years and more					
		Less than 6 years					

BI6	15 Years and more	6 - 14 Years	-.548	.241	.066	-1.12	.03
		6 - 14 Years	.134	.283	.885	-.54	.81
		Less than 6 years	.338	.259	.396	-.28	.96
		15 Years and more	-.134	.283	.885	-.81	.54
		Less than 6 years	.205	.275	.738	-.45	.86
		15 Years and more	-.338	.259	.396	-.96	.28
	6 - 14 Years	6 - 14 Years	-.205	.275	.738	-.86	.45
		6 - 14 Years	-.641*	.261	.042	-1.26	-.02
		Less than 6 years	-.141	.238	.825	-.71	.43
		15 Years and more	.641*	.261	.042	.02	1.26
		Less than 6 years	.500	.253	.125	-.10	1.10
		15 Years and more	.141	.238	.825	-.43	.71
BI7	Less than 6 years	6 - 14 Years	-.500	.253	.125	-1.10	.10

*. The mean difference is significant at the 0.05 level.

Homogeneous Subsets

BI1

Tukey HSD

EXP_3GROUP	N	Subset for alpha = 0.05	
		1	2
Less than 6 years	30	3.67	
15 Years and more	26	3.92	3.92
6 - 14 Years	21		4.29
Sig.		.578	.337

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 25.123.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

BI2

Tukey HSD

EXP_3GROUP	N	Subset for alpha = 0.05	
		1	2
Less than 6 years	30	3.70	
15 Years and more	26	4.19	4.19
6 - 14 Years	21		4.48
Sig.		.235	.613

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 25.123.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

BI7

Tukey HSD

EXP_3GROUP	N	Subset for alpha = 0.05	
		1	2
15 Years and more	26	3.69	
Less than 6 years	30	3.83	3.83
6 - 14 Years	21		4.33
Sig.		.840	.120

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 25.123.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Customer Relationship Management: Post Hoc Tests

(Respondents Experience)

Multiple Comparisons

Dependent Variable			Mean Differen ce (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
CRM1	15 Years and more	6 - 14 Years	-.306	.325	.616	-1.08	.47
		Less than 6 years	-.215	.296	.749	-.92	.49
	6 - 14 Years	15 Years and more	.306	.325	.616	-.47	1.08
		Less than 6 years	.090	.315	.956	-.66	.84
	Less than 6 years	15 Years and more	.215	.296	.749	-.49	.92
		6 - 14 Years	-.090	.315	.956	-.84	.66
CRM2	15 Years and more	6 - 14 Years	-.027	.293	.995	-.73	.67
		Less than 6 years	.015	.268	.998	-.63	.66
	6 - 14 Years	15 Years and more	.027	.293	.995	-.67	.73
		Less than 6 years	.043	.284	.988	-.64	.72
	Less than 6 years	15 Years and more	-.015	.268	.998	-.66	.63
		6 - 14 Years	-.043	.284	.988	-.72	.64
CRM3	15 Years and more	6 - 14 Years	.068	.289	.970	-.62	.76
		Less than 6 years	.282	.264	.536	-.35	.91
	6 - 14 Years	15 Years and more	-.068	.289	.970	-.76	.62
		Less than 6 years	.214	.280	.726	-.46	.88
	Less than 6 years	15 Years and more	-.282	.264	.536	-.91	.35
		6 - 14 Years	-.214	.280	.726	-.88	.46
CRM4	15 Years and more	6 - 14 Years	.363	.275	.389	-.29	1.02
		Less than 6 years	.277	.251	.515	-.32	.88
	6 - 14 Years	15 Years and more	-.363	.275	.389	-1.02	.29
		Less than 6 years	-.086	.267	.945	-.72	.55

CRM5	Less than 6 years	15 Years and more	-.277	.251	.515	-.88	.32
		6 - 14 Years	.086	.267	.945	-.55	.72
	15 Years and more	6 - 14 Years	-.364	.287	.416	-1.05	.32
		Less than 6 years	-.203	.262	.721	-.83	.42
	6 - 14 Years	15 Years and more	.364	.287	.416	-.32	1.05
		Less than 6 years	.162	.278	.830	-.50	.83
CRM6	Less than 6 years	15 Years and more	.203	.262	.721	-.42	.83
		6 - 14 Years	-.162	.278	.830	-.83	.50
	15 Years and more	6 - 14 Years	-.720*	.261	.020	-1.35	-.09
		Less than 6 years	-.510	.239	.089	-1.08	.06
	6 - 14 Years	15 Years and more	.720*	.261	.020	.09	1.35
		Less than 6 years	.210	.254	.688	-.40	.82
CRM7	Less than 6 years	15 Years and more	.510	.239	.089	-.06	1.08
		6 - 14 Years	-.210	.254	.688	-.82	.40
	15 Years and more	6 - 14 Years	-.088	.283	.948	-.77	.59
		Less than 6 years	-.164	.259	.802	-.78	.45
	6 - 14 Years	15 Years and more	.088	.283	.948	-.59	.77
		Less than 6 years	-.076	.275	.959	-.73	.58
CRM8	Less than 6 years	15 Years and more	.164	.259	.802	-.45	.78
		6 - 14 Years	.076	.275	.959	-.58	.73
	15 Years and more	6 - 14 Years	-.181	.292	.810	-.88	.52
		Less than 6 years	-.038	.267	.989	-.68	.60
	6 - 14 Years	15 Years and more	.181	.292	.810	-.52	.88
		Less than 6 years	.143	.284	.870	-.54	.82
	Less than 6 years	15 Years and more	.038	.267	.989	-.60	.68
		6 - 14 Years	-.143	.284	.870	-.82	.54

Homogeneous Subsets

CRM6

Tukey HSD

EXP_3GROUP	N	Subset for alpha = 0.05	
		1	2
15 Years and more	26	3.42	
Less than 6 years	30	3.93	3.93
6 - 14 Years	21		4.14
Sig.		.112	.684

Means for groups in homogeneous subsets are displayed.

- Uses Harmonic Mean Sample Size = 25.123.
- The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Supply Chain Management: Post Hoc Tests

(Respondents Position)

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
SCM1	Between Groups	7.953	2	3.976	4.111	.020
	Within Groups	71.579	74	.967		
	Total	79.532	76			
SCM2	Between Groups	1.706	2	.853	1.146	.324
	Within Groups	55.099	74	.745		
	Total	56.805	76			
SCM3	Between Groups	3.099	2	1.550	1.589	.211
	Within Groups	72.174	74	.975		
	Total	75.273	76			
SCM4	Between Groups	6.960	2	3.480	3.483	.036
	Within Groups	73.924	74	.999		
	Total	80.883	76			
SCM5	Between Groups	3.623	2	1.812	2.459	.092
	Within Groups	54.507	74	.737		
	Total	58.130	76			
SCM6	Between Groups	7.546	2	3.773	4.677	.012
	Within Groups	59.700	74	.807		
	Total	67.247	76			
SCM7	Between Groups	10.290	2	5.145	5.352	.007
	Within Groups	71.138	74	.961		
	Total	81.429	76			
SCM8	Between Groups	2.398	2	1.199	1.561	.217
	Within Groups	56.849	74	.768		
	Total	59.247	76			
SCM9	Between Groups	5.665	2	2.832	3.622	.032
	Within Groups	57.868	74	.782		
	Total	63.532	76			

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) Position3	(J) Position3	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
SCM1	Mgmt.	IT Staff	-.867*	.302	.015	-1.59	-.14
		Other	-.256	.253	.571	-.86	.35
	IT Staff	Mgmt.	.867*	.302	.015	.14	1.59
		Other	.610	.319	.142	-.15	1.37
	Other	Mgmt.	.256	.253	.571	-.35	.86
		IT Staff	-.610	.319	.142	-1.37	.15
SCM2	Mgmt.	IT Staff	-.383	.265	.323	-1.02	.25
		Other	-.019	.222	.996	-.55	.51
	IT Staff	Mgmt.	.383	.265	.323	-.25	1.02
		Other	.364	.280	.399	-.31	1.03
	Other	Mgmt.	.019	.222	.996	-.51	.55
		IT Staff	-.364	.280	.399	-1.03	.31
SCM3	Mgmt.	IT Staff	-.522	.304	.204	-1.25	.20
		Other	-.043	.254	.985	-.65	.57
	IT Staff	Mgmt.	.522	.304	.204	-.20	1.25
		Other	.479	.320	.298	-.29	1.25
	Other	Mgmt.	.043	.254	.985	-.57	.65
		IT Staff	-.479	.320	.298	-1.25	.29
SCM4	Mgmt.	IT Staff	-.506	.307	.233	-1.24	.23
		Other	.348	.257	.370	-.27	.96
	IT Staff	Mgmt.	.506	.307	.233	-.23	1.24
		Other	.854*	.324	.027	.08	1.63
	Other	Mgmt.	-.348	.257	.370	-.96	.27
		IT Staff	-.854*	.324	.027	-1.63	-.08
SCM5	Mgmt.	IT Staff	-.578	.264	.079	-1.21	.05
		Other	-.098	.221	.897	-.63	.43
	IT Staff	Mgmt.	.578	.264	.079	-.05	1.21
		Other	.479	.278	.203	-.19	1.15
	Other	Mgmt.	.098	.221	.897	-.43	.63
		IT Staff	-.479	.278	.203	-1.15	.19
SCM6	Mgmt.	IT Staff	-.706*	.276	.033	-1.37	-.05
		Other	.156	.231	.779	-.40	.71
	IT Staff	Mgmt.	.706*	.276	.033	.05	1.37
		Other	.862*	.291	.011	.16	1.56

SCM7	Other	Mgmt.	-.156	.231	.779	-.71	.40
		IT Staff	-.862*	.291	.011	-1.56	-.16
	Mgmt.	IT Staff	-.933*	.301	.008	-1.65	-.21
		Other	-.026	.252	.994	-.63	.58
	IT Staff	Mgmt.	.933*	.301	.008	.21	1.65
		Other	.908*	.318	.015	.15	1.67
	Other	Mgmt.	.026	.252	.994	-.58	.63
		IT Staff	-.908*	.318	.015	-1.67	-.15
	Mgmt.	IT Staff	-.467	.269	.200	-1.11	.18
		Other	-.064	.226	.956	-.60	.48
	IT Staff	Mgmt.	.467	.269	.200	-.18	1.11
		Other	.403	.284	.338	-.28	1.08
SCM8	Other	Mgmt.	.064	.226	.956	-.48	.60
		IT Staff	-.403	.284	.338	-1.08	.28
	Mgmt.	IT Staff	-.717*	.272	.027	-1.37	-.07
		Other	-.096	.228	.906	-.64	.45
	IT Staff	Mgmt.	.717*	.272	.027	.07	1.37
		Other	.621	.287	.084	-.07	1.31
	Other	Mgmt.	.096	.228	.906	-.45	.64
		IT Staff	-.621	.287	.084	-1.31	.07

*. The mean difference is significant at the 0.05 level.

Homogeneous Subsets

SCM1

Tukey HSD

Position3	N	Subset for alpha = 0.05	
		1	2
Mgmt.	36	3.67	
Other	26	3.92	3.92
IT Staff	15		4.53
Sig.		.657	.100

Means for groups in homogeneous subsets are displayed.

- Uses Harmonic Mean Sample Size = 22.572.
- The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

SCM4

Tukey HSD

Position3	N	Subset for alpha = 0.05	
		1	2
Other	26	3.35	
Mgmt.	36	3.69	3.69
IT Staff	15		4.20
Sig.		.474	.212

Means for groups in homogeneous subsets are displayed.

- Uses Harmonic Mean Sample Size = 22.572.
- The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

SCM6

Tukey HSD

Position3	N	Subset for alpha = 0.05	
		1	2
Other	26	3.54	
Mgmt.	36	3.69	
IT Staff	15		4.40
Sig.		.829	1.000

Means for groups in homogeneous subsets are displayed.

- a. Uses Harmonic Mean Sample Size = 22.572.
- b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

SCM7

Tukey HSD

Position3	N	Subset for alpha = 0.05	
		1	2
Mgmt.	36	3.67	
Other	26	3.69	
IT Staff	15		4.60
Sig.		.996	1.000

Means for groups in homogeneous subsets are displayed.

- a. Uses Harmonic Mean Sample Size = 22.572.
- b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

SCM9

Tukey HSD

Position3	N	Subset for alpha = 0.05	
		1	2
Mgmt.	36	3.75	
Other	26	3.85	3.85
IT Staff	15		4.47
Sig.		.929	.054

Means for groups in homogeneous subsets are displayed.

- a. Uses Harmonic Mean Sample Size = 22.572.
- b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Enterprise Resources Planning: Post Hoc Tests

(Respondents Position)

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
ERP1	Between Groups	6.493	2	3.247	3.668	.030
	Within Groups	65.507	74	.885		
	Total	71T Staff0	76			
ERP2	Between Groups	1.389	2	.694	1.058	.352
	Within Groups	48.559	74	.656		
	Total	49.948	76			
ERP3	Between Groups	2.465	2	1.232	1.561	.217
	Within Groups	58.418	74	.789		
	Total	60.883	76			
ERP4	Between Groups	7.349	2	3.675	4.538	.014
	Within Groups	59.924	74	.810		
	Total	67.273	76			
ERP5	Between Groups	1.971	2	.986	1.261	.289
	Within Groups	57.821	74	.781		
	Total	59.792	76			
ERP6	Between Groups	2.734	2	1.367	2.126	.126
	Within Groups	47.577	74	.643		
	Total	50.312	76			
ERP7	Between Groups	5.463	2	2.732	3.456	.037
	Within Groups	58.485	74	.790		
	Total	63.948	76			
ERP8	Between Groups	4.182	2	2.091	2.833	.065
	Within Groups	54.624	74	.738		
	Total	58.805	76			

Multiple Comparisons

Dependent Variable	(I) Position3	(J) Position3	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
ERP1	Mgmt.	IT Staff	-.411	.289	.335	-1.10	.28
		Other	.402	.242	.228	-.18	.98
	IT Staff	Mgmt.	.411	.289	.335	-.28	1.10
		Other	.813*	.305	.025	.08	1.54
	Other	Mgmt.	-.402	.242	.228	-.98	.18
		IT Staff	-.813*	.305	.025	-1.54	-.08
ERP2	Mgmt.	IT Staff	-.239	.249	.605	-.83	.36
		Other	.143	.208	.772	-.36	.64
	IT Staff	Mgmt.	.239	.249	.605	-.36	.83
		Other	.382	.263	.319	-.25	1.01
	Other	Mgmt.	-.143	.208	.772	-.64	.36
		IT Staff	-.382	.263	.319	-1.01	.25
ERP3	Mgmt.	IT Staff	-.428	.273	.266	-1.08	.23
		Other	.049	.229	.975	-.50	.60
	IT Staff	Mgmt.	.428	.273	.266	-.23	1.08
		Other	.477	.288	.229	-.21	1.17
	Other	Mgmt.	-.049	.229	.975	-.60	.50
		IT Staff	-.477	.288	.229	-1.17	.21
ERP4	Mgmt.	IT Staff	-.394	.277	.333	-1.06	.27
		Other	.459	.232	.123	-.09	1.01
	IT Staff	Mgmt.	.394	.277	.333	-.27	1.06
		Other	.854*	.292	.013	.16	1.55
	Other	Mgmt.	-.459	.232	.123	-1.01	.09
		IT Staff	-.854*	.292	.013	-1.55	-.16
ERP5	Mgmt.	IT Staff	-.106	.272	.920	-.76	.54
		Other	.297	.228	.397	-.25	.84
	IT Staff	Mgmt.	.106	.272	.920	-.54	.76
		Other	.403	.287	.344	-.28	1.09
	Other	Mgmt.	-.297	.228	.397	-.84	.25
		IT Staff	-.403	.287	.344	-1.09	.28
ERP6	Mgmt.	IT Staff	-.494	.246	.118	-1.08	.09
		Other	-.053	.206	.964	-.55	.44
	IT Staff	Mgmt.	.494	.246	.118	-.09	1.08
		Other	.441	.260	.213	-.18	1.06
	Other	Mgmt.	.053	.206	.964	-.44	.55
		IT Staff	-.441	.260	.213	-1.06	.18
ERP7	Mgmt.	IT Staff	-.567	.273	.102	-1.22	.09

ERP8	IT Staff	Other	.179	.229	.714	-.37	.73
		Mgmt.	.567	.273	.102	-.09	1.22
		Other	.746*	.288	.031	.06	1.44
	Other	Mgmt.	-.179	.229	.714	-.73	.37
		IT Staff	-.746*	.288	.031	-1.44	-.06
	Mgmt.	IT Staff	-.628	.264	.052	-1.26	.00
		Other	-.207	.221	.619	-.74	.32
		Mgmt.	.628	.264	.052	.00	1.26
	IT Staff	Other	.421	.279	.292	-.25	1.09
		Mgmt.	.207	.221	.619	-.32	.74
		IT Staff	-.421	.279	.292	-1.09	.25
	Other	Mgmt.	.207	.221	.619	-.32	.74
		IT Staff	-.421	.279	.292	-1.09	.25

*. The mean difference is significant at the 0.05 level.

Homogeneous Subsets

ERP1

Tukey HSD

Position3	N	Subset for alpha = 0.05	
		1	2
Other	26	3.65	
Mgmt.	36	4.06	4.06
IT Staff	15		4.47
Sig.		.329	.312

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.572.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

ERP4

Tukey HSD

Position3	N	Subset for alpha = 0.05	
		1	2
Other	26	3.35	
Mgmt.	36	3.81	3.81
IT Staff	15		4.20

Sig.		.206	.310
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Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.572.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

ERP7

Tukey HSD

Position3	N	Subset for alpha = 0.05	
		1	2
Other	26	3.65	
Mgmt.	36	3.83	3.83
IT Staff	15		4.40
Sig.		.777	.089

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.572.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

E-Commerce: Post Hoc Tests

(Respondents Position)

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
EC1	Between Groups	2.537	2	1.269	1.403	.252
	Within Groups	66.917	74	.904		
	Total	69.455	76			
EC2	Between Groups	3.126	2	1.563	1.545	.220
	Within Groups	74.874	74	1.012		
	Total	78.000	76			
EC3	Between Groups	7.828	2	3.914	4.369	.016
	Within Groups	66.302	74	.896		
	Total	74.130	76			
EC4	Between Groups	5.660	2	2.830	3.132	.049
	Within Groups	66.859	74	.904		
	Total	72.519	76			
EC5	Between Groups	5.110	2	2.555	2.522	.087
	Within Groups	74.968	74	1.013		
	Total	80.078	76			
EC6	Between Groups	3.323	2	1.662	2.678	.075
	Within Groups	45.924	74	.621		
	Total	49.247	76			
EC7	Between Groups	2.048	2	1.024	1.384	.257
	Within Groups	54.757	74	.740		
	Total	56.805	76			
EC8	Between Groups	4.554	2	2.277	2.991	.056
	Within Groups	56.329	74	.761		
	Total	60.883	76			

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) Position3	(J) Position3	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
EC1	Mgmt.	IT Staff	-.244	.292	.682	-.94	.45
		Other	.261	.245	.539	-.32	.85
	IT Staff	Mgmt.	.244	.292	.682	-.45	.94
		Other	.505	.308	.236	-.23	1.24
	Other	Mgmt.	-.261	.245	.539	-.85	.32
		IT Staff	-.505	.308	.236	-1.24	.23
EC2	Mgmt.	IT Staff	-.456	.309	.309	-1.19	.28
		Other	.098	.259	.924	-.52	.72
	IT Staff	Mgmt.	.456	.309	.309	-.28	1.19
		Other	.554	.326	.213	-.23	1.33
	Other	Mgmt.	-.098	.259	.924	-.72	.52
		IT Staff	-.554	.326	.213	-1.33	.23
EC3	Mgmt.	IT Staff	-.689	.291	.053	-1.38	.01
		Other	.201	.244	.689	-.38	.78
	IT Staff	Mgmt.	.689	.291	.053	-.01	1.38
		Other	.890*	.307	.013	.16	1.62
	Other	Mgmt.	-.201	.244	.689	-.78	.38
		IT Staff	-.890*	.307	.013	-1.62	-.16
EC4	Mgmt.	IT Staff	-.606	.292	.102	-1.30	.09
		Other	.143	.245	.828	-.44	.73
	IT Staff	Mgmt.	.606	.292	.102	-.09	1.30
		Other	.749*	.308	.046	.01	1.49
	Other	Mgmt.	-.143	.245	.828	-.73	.44
		IT Staff	-.749*	.308	.046	-1.49	-.01
EC5	Mgmt.	IT Staff	-.578	.309	.155	-1.32	.16
		Other	.132	.259	.866	-.49	.75
	IT Staff	Mgmt.	.578	.309	.155	-.16	1.32
		Other	.710	.326	.082	-.07	1.49
	Other	Mgmt.	-.132	.259	.866	-.75	.49
		IT Staff	-.710	.326	.082	-1.49	.07
EC6	Mgmt.	IT Staff	-.506	.242	.099	-1.08	.07
		Other	.041	.203	.978	-.44	.53
	IT Staff	Mgmt.	.506	.242	.099	-.07	1.08
		Other	.546	.255	.089	-.06	1.16
	Other	Mgmt.	-.041	.203	.978	-.53	.44

EC7	Mgmt.	IT Staff	-.546	.255	.089	-1.16	.06
		IT Staff	-.439	.264	.227	-1.07	.19
		Other	-.152	.221	.773	-.68	.38
		Mgmt.	.439	.264	.227	-.19	1.07
		IT Staff	.287	.279	.561	-.38	.95
		Other	.152	.221	.773	-.38	.68
	Other	Mgmt.	-.287	.279	.561	-.95	.38
		IT Staff	-.617	.268	.062	-1.26	.02
		Other	-.006	.225	1.000	-.54	.53
		Mgmt.	.617	.268	.062	-.02	1.26
		IT Staff	.610	.283	.085	-.07	1.29
		Other	.006	.225	1.000	-.53	.54
EC8	Other	Mgmt.	.006	.225	1.000	-.53	.54
		IT Staff	-.610	.283	.085	-1.29	.07

*. The mean difference is significant at the 0.05 level.

Homogeneous Subsets

EC3

Tukey HSD

Position3	N	Subset for alpha = 0.05	
		1	2
Other	26	3.58	
Mgmt.	36	3.78	
IT Staff	15		4.47
Sig.		.757	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.572.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

EC4

Tukey HSD

Position3	N	Subset for alpha = 0.05	
		1	2
Other	26	3.38	
Mgmt.	36	3.53	3.53
IT Staff	15		4.13
Sig.		.869	.089

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.572.

E-Collaboration: Post Hoc Tests

(Respondents Position)

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
COL1	Between Groups	1.131	2	.566	.657	.522
	Within Groups	63.752	74	.862		
	Total	64.883	76			
COL2	Between Groups	1.081	2	.541	.717	.492
	Within Groups	55.802	74	.754		
	Total	56.883	76			
COL3	Between Groups	.555	2	.278	.496	.611
	Within Groups	41.445	74	.560		
	Total	4IT Staff0	76			
COL4	Between Groups	.653	2	.327	.401	.671
	Within Groups	60.334	74	.815		
	Total	60.987	76			
COL5	Between Groups	2.762	2	1.381	1.684	.193
	Within Groups	60.693	74	.820		
	Total	63.455	76			
COL6	Between Groups	7.531	2	3.765	4.976	.009
	Within Groups	56.002	74	.757		
	Total	63.532	76			
COL7	Between Groups	1.435	2	.717	.885	.417
	Within Groups	59.994	74	.811		
	Total	61.429	76			
COL8	Between Groups	5.083	2	2.541	3.192	.047
	Within Groups	58.917	74	.796		
	Total	64.000	76			
COL9	Between Groups	1.469	2	.734	.852	.431
	Within Groups	63.804	74	.862		
	Total	65.273	76			

Multiple Comparisons

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) Position3	(J) Position3	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
COL1	Mgmt.	IT Staff	-.239	.285	.681	-.92	.44
		Other	.105	.239	.900	-.47	.68
	IT Staff	Mgmt.	.239	.285	.681	-.44	.92
		Other	.344	.301	.492	-.38	1.06
	Other	Mgmt.	-.105	.239	.900	-.68	.47
		IT Staff	-.344	.301	.492	-1.06	.38
COL2	Mgmt.	IT Staff	-.311	.267	.477	-.95	.33
		Other	-.034	.223	.987	-.57	.50
	IT Staff	Mgmt.	.311	.267	.477	-.33	.95
		Other	.277	.282	.590	-.40	.95
	Other	Mgmt.	.034	.223	.987	-.50	.57
		IT Staff	-.277	.282	.590	-.95	.40
COL3	Mgmt.	IT Staff	-.217	.230	.616	-.77	.33
		Other	-.122	.193	.803	-.58	.34
	IT Staff	Mgmt.	.217	.230	.616	-.33	.77
		Other	.095	.243	.919	-.49	.68
	Other	Mgmt.	.122	.193	.803	-.34	.58
		IT Staff	-.095	.243	.919	-.68	.49
COL4	Mgmt.	IT Staff	-.228	.277	.691	-.89	.44
		Other	.011	.232	.999	-.55	.57
	IT Staff	Mgmt.	.228	.277	.691	-.44	.89
		Other	.238	.293	.695	-.46	.94
	Other	Mgmt.	-.011	.232	.999	-.57	.55
		IT Staff	-.238	.293	.695	-.94	.46
COL5	Mgmt.	IT Staff	-.494	.278	.185	-1.16	.17
		Other	-.246	.233	.545	-.80	.31
	IT Staff	Mgmt.	.494	.278	.185	-.17	1.16
		Other	.249	.294	.675	-.45	.95
	Other	Mgmt.	.246	.233	.545	-.31	.80
		IT Staff	-.249	.294	.675	-.95	.45
COL6	Mgmt.	IT Staff	-.789*	.267	.012	-1.43	-.15
		Other	-.466	.224	.101	-1.00	.07
	IT Staff	Mgmt.	.789*	.267	.012	.15	1.43
		Other	.323	.282	.489	-.35	1.00
	Other	Mgmt.	.466	.224	.101	-.07	1.00

COL7	Mgmt.	IT Staff	-.323	.282	.489	-1.00	.35
		IT Staff	-.356	.277	.408	-1.02	.31
		Other	-.030	.232	.991	-.58	.52
	IT Staff	Mgmt.	.356	.277	.408	-.31	1.02
		Other	.326	.292	.508	-.37	1.02
		Mgmt.	.030	.232	.991	-.52	.58
COL8	Other	IT Staff	-.326	.292	.508	-1.02	.37
		IT Staff	-.689*	.274	.037	-1.34	-.03
		Other	-.261	.230	.496	-.81	.29
	IT Staff	Mgmt.	.689*	.274	.037	.03	1.34
		Other	.428	.289	.306	-.26	1.12
		Mgmt.	.261	.230	.496	-.29	.81
COL9	Other	IT Staff	-.428	.289	.306	-1.12	.26
		IT Staff	-.217	.285	.729	-.90	.47
		Other	-.301	.239	.422	-.87	.27
	IT Staff	Mgmt.	.217	.285	.729	-.47	.90
		Other	-.085	.301	.957	-.80	.64
		Mgmt.	.301	.239	.422	-.27	.87
	Other	IT Staff	.085	.301	.957	-.64	.80

*. The mean difference is significant at the 0.05 level.

Homogeneous Subsets

COL6

Tukey HSD

Position3	N	Subset for alpha = 0.05	
		1	2
Mgmt.	36	3.61	
Other	26	4.08	4.08
IT Staff	15		4.40
Sig.		.177	.429

COL8

Tukey HSD

Position3	N	Subset for alpha = 0.05	
		1	2
Mgmt.	36	3.78	
Other	26	4.04	4.04
IT Staff	15		4.47
Sig.		.591	.247

APPENDIX C: FACTORS ANALYSIS Tables

Extraction Method: Principal Component Analysis

Full data of Table 6.2: Total Variance Explained (e-Business risk)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	21.242	43.351	43.351	21.242	43.351	43.351	7.221	14.736	14.736
2	3.127	6.381	49.732	3.127	6.381	49.732	5.040	10.285	25.021
3	2.483	5.067	54.799	2.483	5.067	54.799	3.843	7.842	32.863
4	2.119	4.324	59.123	2.119	4.324	59.123	3.742	7.637	40.501
5	1.895	3.868	62.990	1.895	3.868	62.990	3.557	7.259	47.760
6	1.824	3.723	66.714	1.824	3.723	66.714	3.557	7.259	55.018
7	1.371	2.798	69.512	1.371	2.798	69.512	3.172	6.473	61.491
8	1.351	2.758	72.270	1.351	2.758	72.270	2.836	5.787	67.279
9	1.272	2.595	74.865	1.272	2.595	74.865	2.727	5.565	72.844
10	1.015	2.072	76.936	1.015	2.072	76.936	IT Staff5	4.093	76.936
11	.996	2.033	78.969						
12	.930	1.899	80.868						
13	.748	1.527	82.395						
14	.720	1.469	83.864						
15	.707	1.442	85.306						
16	.621	1.268	86.575						
17	.574	1.171	87.745						
18	.535	1.091	88.836						
19	.490	1.000	89.836						
20	.447	.913	90.749						
21	.412	.840	91.589						
22	.385	.786	92.374						
23	.378	.772	93.146						
24	.373	.760	93.906						
25	.320	.652	94.559						
26	.306	.624	95.182						
27	.248	.506	95.688						
28	.228	.466	96.154						
29	.214	.438	96.592						
30	.186	.379	96.971						
31	.180	.367	97.338						
32	.176	.359	97.697						
33	.151	.308	98.005						
34	.133	.272	98.277						

35	.121	.248	98.524						
36	.104	.213	98.737						
37	.096	.196	98.934						
38	.087	.178	99.112						
39	.068	.140	99.251						
40	.064	.131	99.382						
41	.061	.125	99.507						
42	.051	.105	99.611						
43	.043	.088	99.699						
44	.040	.082	99.781						
45	.032	.065	99.846						
46	.024	.049	99.895						
47	.022	.044	99.939						
48	.018	.037	99.976						
49	.012	.024	100.000						

Extraction Method: Principal Component Analysis.

Rotation Method

Full data of Table 6.3: Rotated Component Matrix for e-Business Risks

	Component									
	1	2	3	4	5	6	7	8	9	10
COL8	.747	.144	.142	.193	.043	.210	.213	.086	.036	-.020
COL3	.730	.176	-.052	.106	.272	.067	.106	.230	.142	-.102
COL2	.702	.184	.146	.140	.181	-.031	.133	.118	.120	.169
COL7	.671	.239	.066	.086	.215	.234	.139	.026	-.043	.144
COL5	.627	.018	.280	.127	-.061	.205	.367	.081	.186	.326
COL6	.621	.118	.354	.088	-.129	.405	.221	.194	.173	.111
COL9	.620	-.137	-.059	-.170	.043	.163	-.054	.248	.397	.326
COL1	.606	.315	.168	.268	.286	-.085	.145	.191	.015	.115
COL4	.579	.165	.125	.094	.414	.274	.070	.132	.166	-.010
EC6	.525	.129	.195	.231	.192	.251	-.006	.384	-.003	.228
CRM4	.096	.814	.049	.162	.077	.189	.114	.107	.147	.111
CRM3	.047	.749	.010	.268	.220	.283	.092	.054	.044	-.056
SCM6	.467	.716	.114	.037	.129	.112	.201	.019	-.040	.185
ERP1	.329	.661	.320	.077	.132	-.164	.007	.043	.309	-.069
SCM3	.309	.553	-.082	-.003	.211	-.050	.518	.259	.108	.014
ERP7	-.010	.512	.284	.064	.361	.084	.224	-.096	.428	.123
SCM4	.343	.511	-.156	.222	.079	-.071	.168	.347	.219	.215
CRM8	.068	.456	.020	.402	.139	.300	.269	.059	.268	.363
BI7	.089	-.098	.834	.092	.195	.028	.028	.146	.071	-.030
CRM6	-.023	.224	.727	.043	.035	.148	.173	.348	.062	.178
ERP6	.228	.115	.667	-.002	.262	.145	.266	.006	.274	.314
ERP2	.475	.280	.544	.305	.108	.003	-.042	.201	.122	-.236
BI1	.321	.226	.482	.369	.197	.233	.128	-.081	.154	.125
EC2	.221	.148	.111	.741	.022	.229	.090	.168	-.093	.019
EC1	.197	.137	.029	.670	.228	.366	.097	.037	.290	.117
EC3	.124	.203	.110	.597	.171	-.016	.246	.395	.149	.272
BI5	.227	.257	.240	.503	.424	.068	.068	-.167	.077	.114
BI4	.233	.169	.131	.085	.784	.019	.141	.181	.037	.222
BI3	.269	.207	.194	.126	.769	.215	.197	-.011	.199	.028
BI2	.272	.226	.223	.398	.623	.205	.166	.025	.124	-.062
CRM5	.170	.289	.163	.179	.155	.652	.179	.290	.029	.079
SCM9	.386	.220	.125	.162	.217	.630	.178	.276	-.079	.119
BI6	.548	-.068	-.047	.219	.197	.565	.083	.030	.153	-.036
EC8	.299	.005	.327	.323	-.077	.502	.096	.276	.417	.002
ERP8	.372	.180	.405	.278	.056	.488	.068	-.004	.285	.234
SCM7	.383	.349	.117	.136	.172	.120	.663	.120	.054	.122
SCM5	.325	-.011	.389	.123	.140	.084	.627	.210	.000	.159
SCM1	.376	.235	.095	.184	.281	.356	.575	.106	.070	.063
CRM2	.043	.304	.074	.383	.217	.402	.512	.081	.175	.091
CRM1	.009	.376	.153	.419	.199	.368	.471	.034	.165	.140
SCM8	.317	.098	.193	-.011	-.109	.119	.201	.700	.104	.067
EC7	.221	.024	.334	.192	.111	.226	-.051	.673	.141	.273
SCM2	.208	.201	.119	.166	.415	.266	.251	.614	.049	-.039
ERP4	.104	.148	.117	.000	.179	-.010	.101	.130	.804	.041
ERP5	.193	.398	.179	.263	-.063	.217	-.087	.102	.626	.025
ERP3	.422	.137	.278	.266	.232	.091	.333	-.020	.499	.026
EC5	.207	.128	.247	.273	.065	.140	.204	.301	.140	.617
EC4	.369	.198	.118	.405	.284	-.175	.281	.139	.038	.468
CRM7	.211	.389	.112	.108	.287	.344	.092	.165	-.105	.467

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 15 iterations.

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