UNIVERSITY OF KWAZULU-NATAL

The use of Information and Communication Technologies in South African hotels-a self-evaluation by hotel managers

By

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DECLARATION

I, Nomsa Margareth Mndzebele declare that

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Signed: Mndzebele Date: 03/04/2012

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Abstract

It is fair to assume that the level of participation in a world economy depends on the capacity of business organisations to use technology efficiently. Conducting business in the world today is driven by information technology. Internet technology has changed various business activities and transactions. In the Internet age, the development of electronic commerce (EC) is considered a major indicator of the overall competitiveness of organisations. An EC marketing channel can bring customers more benefits such as greater shopping convenience and potentially lower prices. Today, most hotels have been forced by the market to consider adopting EC to carry out business processes more efficiently. Hence, the purpose of the study is to determine the determinants of EC adoption by hotels in South Africa.

This study is based on Tornatzky and Fleicher's (1990) technological, organizational and environmental (TOE) model that includes technological context, organisational context and environmental context. The TOE model has been widely used to examine the factors that influence organisational technology adoption. The research model looked at eight determinants, which are (1) relative advantage, (2) compatibility, (3) complexity, (4) organisational size, (5) technology knowledge, (6) managers' attitudes towards EC, (7) information intensity and (8) competition.

A quantitative research design was used and a questionnaire was used to collect data and answer the research questions in the study. Four hundred hotels were randomly selected from the three groups of hotels suggested by the South African Tourism office, i.e. (1) Tourism Grading council hotel listing, (2) Tshwane accommodation listing and (3) AA travel accommodation. A total of 332 questionnaires were collected for data analysis, which represents a 94.9% response rate. Descriptive statistics, correlational statistics, one way analysis of variance, (ANOVA), regression analysis, cross tabulation tests and multivariate analyses of variance (MANOVA) were used to analyse the data.

The results indicated that all three contexts (TOE) were important in the decision of EC adoption by the hotels in South Africa. The findings indicated that not all the determinants used had a statistically significant relationship with the extent of EC adoption in the hotel industry. The researcher also found out that hotels were more concerned about the benefits of EC than the organisational ability to adopt EC, the hotels that had sufficient resources

were more willing to adopt EC. The findings also indicated that managers' attitude towards EC adoption is influential on the extent of EC adoption. Finally, findings indicated that there is a lot of pressure from suppliers and customers for the hotels to use EC. Even though the mangers that filled in the questionnaire were computer literate, technology knowledge of EC would help managers to realise which systems are most appropriate.

TABLE OF CONTENTS

Declaration …….....…….. ii

Acknowledgements ……..…..……..….iii

Abstract ……..…..…..…..... iv

List of Tables ……..……..……..…….....x

List of Figures……..……..……..…….... xiii

List of Abbreviations and Acronyms …….……..……..…….....xiv

1. CHAPTER: INTRODUCTION TO THE STUDY 1
   1.1 Introduction 1
   1.2 Background and Context 2
   1.3 Extent of Adoption of Electronic Commerce 3
   1.4 The Study's Variables: 4
   1.5 Problem Statement 5
      1.5.1 Sub-problems 6
   1.6 Research Objectives 7
   1.7 Research Questions 8
   1.8 Research Methodology 8
   1.9 Importance/Significance of the Study 9
   1.10 Organisation of the Study 9
   1.11 Conclusion 10
2 CHAPTER: LITERATURE REVIEW 12
   2.1 Introduction 12
   2.2 Innovation 12
   2.3 Electronic Commerce 14
      2.3.1 The Status of Electronic Commerce in South Africa 18
   2.4 EC Adoption 23
   2.5 Hotels 27
      2.5.1 Hotels and Technology 28
      2.5.2 Hotels in South Africa 31
   2.6 Determinants of Electronic Commerce 32

2.6.1 Technological Factors 32
2.6.2 Organisational Factors 36
2.6.3 Environmental Factors 40
2.6.4 Extent of Electronic Commerce Adoption 42
2.7 Conclusion 44
3 CHAPTER: DESIGN MODEL 46
3.1 Introduction 46
3.2 Tornatzky and Fleischer's Technology Organisational and Environmental (TOE) Model 48
3.2.1 Technological Context 50
3.2.2 Organisational Context 50
3.2.3 Environmental Context 51
3.3 Diffusion of Innovation Theory 51
3.4 The Research Design Model 52
3.5 Conclusion 54
4. CHAPTER: RESEARCH DESIGN AND METHODOLOGY 56
4.1 Introduction 56
4.2 Research Design 56
4.3 Ethical Considerations 57
4.4 Population 58
4.5 The Sampling Methods 58
4.5.1 The Sample Size 59
4.6 Pilot Study 60
4.7 Methods of Data Collection 61
4.8 Research Questions 61
4.8.1 Research Question 1, 2 and 3 62
4.8.2 Research Question 4 (Section 4. The Extent of EC Adoption) 62
4.9 Instrumentation 64
4.9.1 Technological Context 65
4.9.2 Organisational Context 66
4.9.3 Environmental Context 67
4.9.4 Extent of Adoption of Electronic Commerce 67
4.10 Data Analysis 68
4.11 Limitations 69
4.12 Conclusion 69

5. CHAPTER: DATA ANALYSIS AND RESULTS 71
5.1 Introduction 71
5.2 Socio-Demographic Descriptive Analysis 72
5.2.1 Position in the Organisation 74
5.2.2 Qualification 74
5.2.3 Reliability Analysis 75
5.2.4 Exploratory Factor Analysis 76
5.2.5 Factor Analysis 76
5.2.6 Extent of Adoption of EC Descriptive Analysis 77
5.2.7 Probability. 77
5.2.8 Assumptions that underpin the use of regression: 80
5.3 Technological Factors 81
5.3.1 Relative Advantage 82
5.3.2 Compatibility 94
5.3.3 Complexity 102
5.4 Organisational Context 108
5.4.1 Size 109
5.4.2 Manager's Technology Knowledge 118
5.4.3 Manager's Attitudes 125
5.5 Environmental Factors 133
5.5.1 Information Intensity 133
5.5.2 Competition 140
5.6 The Extent of EC Adoption 147
5.6.1 B2C Outbound Communication 147
5.6.2 B2C Order taking 152
5.6.3 B2B Inbound Communication 156
5.6.4 B2B Outbound Communication 159
5.7 Manova 164
5.7.1 Website 164
5.7.2 Location 165
5.7.3 Gender 166
5.7.4 Age 168
5.7.5 Position 169
6 CHAPTER: DISCUSSION 170
6.1 Introduction 170

6.2 Findings 170
6.2.1 Research Question 1: Technological context 170
6.2.2 Research Question 2: Organisational context 171
6.2.3 Research Question 3: Environmental context 171
6.2.4 Research Question 4: Extent of adoption of EC 172
6.3 Interpretations 173
6.3.1 Socio-demographic Factors 173
6.3.2 Technology Factors 175
6.3.2.1 Relative Advantage 175
6.3.2.2 Compatibility 175
6.3.2.3 Complexity 176
6.3.3 Organisational Factors 176
6.3.3.1 Organisational Size 177
6.3.3.2 Manager's Attitude Towards EC Adoption 178
6.3.3.3 Manager's Technology Knowledge 178
6.3.4 Environmental Factors 179
6.3.4.1 Information Intensity 179
6.3.4.2 Competition 179
6.4 Practical Implications and Recommendations 180
7. CHAPTER: LIMITATIONS, RECOMMENDATIONS AND CONCLUSIONS 182
7.1 Limitations 182
7.2 Recommendations for Future Research 183
7.3 Conclusions 185
REFERENCES 189
APPENDIX 1: Questionnaire 209
APPENDIX 3: Factor Loading 218
APPENDIX 4: MANOVA for all the Variables 222
APPENDIX 5: Letter to Respondents 270
APPENDIX 5: Ethical Clearance Letter 271

List of Tables

Table 3.1 Research questions in relation to the model 54
Table 4.1 Structure of the Questionnaire 64
Table 4.2 Items to measure manager's profile 65
Table 4.3 Attributes of innovation 65
Table 4.4 Constructs of organizational factors 66
Table 4.5 Constructs of environmental factors 67
Table 4.6 Constructs of the Extent of e-Commerce Adoption 68
Table 5.1: Frequency distribution of sampled (hotels) respondents by location 72
Table 5.2: Frequency distribution of sampled managers by age 73
Table 5.3: Reliability statistics 75
Table 5.4: KMO and Bartlett's tests 76
Table 5.5: Descriptive statistics of the extent of EC adoption 77
Table 5.6: Descriptive statistics of relative advantage of EC 82
Table 5.7: (based on Question 1 from the questionnaire) 82
Table 5.8: (based on Question 2 from the questionnaire) 83
Table 5.9: (based on Question 4 of the questionnaire) 84
Table 5.10: Correlation among the facilities available in the hotel 86
Table 5.11: Correlation analysis of relative advantage 87
Table 5.12: B2C outbound communication 88
Table 5.13: B2C order taking 89
Table 5.14: B2B inbound communication 90
Table 5.15: B2B outbound communication 91
Table 5.16: Summary of the questions on relative advantage in relation to the dependent variables…. 92
Table 5.17: Multiple regression analysis on the extent of adoption of EC on relative advantage 93
Table 5.18: Descriptive statistics of compatibility of EC 95
Table 5.19: Correlation analysis of compatibility with the extent of EC adoption 95
Table 5.20: B2C outbound communication 97
Table 5.21: B2C order taking 97
Table 5.22: B2B inbound communication 98
Table 5.23: B2B outbound communication 98
Table 5.24: Summary of significant items of compatibility in relation to dependent variables 99
Table 5.25: Multiple regression analysis on the extent of adoption of EC on compatibility 100
Table 5.26: Association between EC and compatibility 101
Table 5.27: Descriptive statistics of complexity of EC 102
Table 5.28: Correlation analysis of complexity of EC 103
Table 5.29: B2C outbound communication 104
Table 5.30: B2C Order taking 104
Table 5.31: B2B inbound communication 105
Table 5.32: B2B outbound communication 105
Table 5.33: Summary of questions on complexity in relation to the dependent variables 106
Table 5.34: Multiple regression analysis on the extent of EC adoption 108
Table 5.35: Descriptive statistics of managers' IT knowledge of EC 110
Table 5.36: Comparison of hotel ownership 110
Table 5.37: Frequency distribution table of the number of employees 112
Table 5.38: Multiple regression analysis on size 115
Table 5.39: B2C order taking 115

Table 5.40: B2B inbound communication 116
Table 5.41: B2B outbound communication 116
Table 5.42: Summary of questions on size in relation to dependent variables 117
Table 5.43: Multiple regression analysis on the extent of EC adoption 118
Table 5.44: Descriptive statistics of managers IT knowledge of EC 118
Table 5.45: Multiple regression analysis on the extent of adoption of EC on information technology knowledge 124
Table 5.46: Descriptive statistics of management attitudes to EC 125
Table 5.47: Correlation analysis of management attitudes to EC adoption 125
Table 5.48: B2C outbound communication 126
Table 5.49: B2C order taking 127
Table 5.50: B2B inbound communication 128
Table 5.51: B2B outbound communication 129
Table 5.52: Summary of questions on management attitudes in relation to the dependent variable…. 129
Table 5.53: Multiple regression analysis on the extent of EC adoption 132
Table 5.54: Descriptive statistics of information intensity of EC 134
Table 5.55: Correlation analysis of information intensity of EC 134
Table 5.56: B2C inbound communication 135
Table 5.57: B2C order taking 136
Table 5.58: B2B inbound communication 136
Table 5.59: B2B outbound communication 137
Table 5.60: Summary of questions on information intensity in relation to the dependent variables… 137
Table 5.61: Multiple regression analysis on the extent of EC adoption 138
Table 5.62: Association between the hotel having its own website and information intensity 138
Table 5.63: Association between a hotel having its own Internet connection and information intensity. 139
Table 5.64: Descriptive statistics of competition 140
Table 5.65: Correlation analysis of competition of EC 141
Table 5.66: B2C outbound communication 142
Table 5.67: B2C order taking 143
Table 5.68: B2B inbound communication 143
Table 5.69: B2B outbound communication 144
Table 5.70: Summary of the questions on the association between a hotel having its own Internet connection and information intensity 144
Table 5.71: Multiple regression analysis on the extent of EC adoption 146
Table 5.72: Correlation analysis of B2C outbound communication 147
Table 5.73: Multiple regression analysis of B2C outbound communication 148
Table 5.74: Multiple regression coefficients (a) 149
Table 5.75: Descriptive statistics of B2C outbound communication of EC 149
Table 5.76: Association between a hotel having Internet and B2C order taking 150
Table 5.77: Table showing the association between the hotel having a website and B2C outbound communication 151
Table 5.78: Correlation analysis of B2C order taking 152
Table 5.79: Multiple regression analysis of B2C order taking 153
Table 5.80: Multiple regression coefficients 153
Table 5.81: Descriptive statistics of B2C order taking of EC 154
Table 5.82: Association between the hotel having a website and B2C order taking 154
Table 5.83: Association between the hotel having Internet and B2C order taking 155

Table 5.84: Correlation analysis of B2B inbound communication 156
Table 5.85: Multiple regression analysis of B2B inbound communication..... 157
Table 5.86: Multiple regression coefficients..... 158
Table 5.87: Descriptive statistics of competition of EC..... 158
Table 5.88: Association between the hotel having a website and B2B inbound communication.... 158
Table 5.89: Correlation analysis on B2B outbound communication 160
Table 5.90: Multiple regression analysis of B2B outbound communication..... 160
Table 5.91: Multiple regression coefficients..... 161
Table 5.92: Descriptive statistics of B2B outbound communication..... 161
Table 5.93: Association between a hotel having Internet and B2B outbound communication 161
Table 5.94: Table showing the association between the hotel having a website and B2B outbound communication 162
Table 5.95: Correlation among independent variables and dependent variables 163
Table 5.96: Comparison of dependent variables by having a website or not 164
Table 5.97: Comparison of dependent variables by location of respondent..... 165
Table 5.98: Comparison of dependent variables by gender of respondent (B2C Outbound) 166
Table 5.99: Comparison of dependent variables by gender of respondent (B2C Order taking).... 166
Table 5.100: Comparison of dependent variables by gender of respondent (B2B Inbound) 167
Table 5.101: Comparison of dependent variables by gender of respondent (B2B Outbound)..... 167
Table 5.102: Comparison of dependent variables by age of respondent 168
Table 5.103: Comparison of dependent variables by position of respondent..... 169

List of Figures

Figure 3.1: The TOE model by Tornatzky and Fleischer 1990 49
Figure 3.2: Proposed Research Model 53
Figure 5.1: Classification of hotels by provinces 73
Figure 5.2: Hotel by ownership, employment, guestrooms and size 110
Figure 5.3: Hotel ownership affiliation by province 111
Figure 5.4: Comparison of the number of employees in relation to the guestrooms 112
Figure 5.5: Number of guest rooms in organisation 113
Figure 5.6: Number of stars hotel has 114
Figure 5.7: Graph showing a summary of Question 5 of the questionnaire 119
Figure 5.8: Have attended computer classes 119
Figure 5.9: Have formal computer qualifications 120
Figure 5.10: Have formal computer qualifications by age 120
Figure 5.11: Use of internet by gender 121
Figure 5.12: Use of database by gender 122
Figure 5.13: Use of Microsoft word by gender 123
Figure 5.14: Use of PowerPoint by gender 123

LIST OF ABBREVIATIONS

ABREVIATIONS MEANING

ADSL	-Asymmetric digital subscriber line
ANOVA	-Analysis of Variance
DIT	-Diffusion of Innovation Theory
AISI	-African Information Society Initiative
B2B	-Business to business
B2C	-Business to Consumer
C2B	-Consumer to Business
C2C	-Consumer to Consumer
CRM	-Customer Relations Management
EC	-Electronic Commerce
E-check-out	-Electronic check out
EFA	-Exploratory Factor Analysis
E-Government	-Electronic Government.
G2B	-Government to Business
GDP	-Gross Domestic Product
G2E	-Government to Employees
GDS	-Global Distribution System
ICT	-Information and Communications Technology
IP	-Internet Protocol

IT	-Information Technology
IPTV	-Internet Protocol television
MANOVA	-Multiple Analyses of Variance
PMS	-Property Management System
SA	-South Africa
SEM	-Structural Equation Models
SMME	-Small Micro Medium Enterprise
SPSS	-Statistical Package for Social Sciences
TAM	-Technology Acceptance Model
TOE	-Technology organization environment
TGSA	-Tourism Grading Council of South Africa
UKZN	-University of KwaZulu-Natal
UN	- United Nations
VoIP	-Voice over Internet Protocol
WWW	-World Wide Web

1. CHAPTER: INTRODUCTION TO THE STUDY

1.1 Introduction

Technology has rapidly and radically changed the way a number of organisations conduct business. Information technology (IT) has become crucial in terms of influencing and shaping organisational strategy and success. It is therefore necessary for an organisation to successfully adopt technological innovations. Failure to adopt IT has become a managerial concern. Electronic commerce (EC) should be adopted, managed and operated at maximum effectiveness if one's business is to succeed in the global marketplace of the 21st century (King, Viehland & Lee, 2006). Electronic commerce is intended to provide businesses with the opportunity to grow in efficiency. For instance, the use of EC for business transactions is considered to be an important tool in conducting business. EC can provide the opportunity to create new relationships between buyers and sellers, as well as provide opportunities for all kinds of business organisations to share information on a daily basis (Tan, Tyler & Manica, 2007). With EC, businesses can sell and buy goods and services, and can have direct contact with their customers. In addition, businesses and customers can eliminate the costs involved in working through intermediaries. Flight and hotel reservations, bill payment and banking services are just some of the services provided by EC.

Today, businesses have become dependent upon EC facilities to communicate with and operate businesses of various kinds, as well as to buy goods and services (MacGregor & Vrazalilc, 2007). Kumar, Kumar & de Grosbois, (2008: 13) claim that "electronic commerce represents the application of information and communication technology along the whole value chain of business processes conducted electronically and designed to enable the accomplishment of a business goal". Schneider (2007: 5) defines EC as follows: "[e]lectronic commerce is associated with the buying and selling of information, products and services via computer networks". Electronic commerce uses information or processing capacities to improve relationships between suppliers and customers, and also to enhance organisational performance; organisations that treat EC as a transaction vehicle and communication tool have gained a competitive advantage. Organisations need to have an understanding of EC in order to become aware of the opportunities and barriers involved in adopting it.

Carayannis & Turner (2006: 748) wrote that:

> "The primary motivation for businesses to adopt new technologies is the anticipated benefits these technologies would bring to the company. However, before organisations can anticipate the benefits, they must first be aware of the need for the innovation and how that innovation can be used to overcome existing gaps or exploit new opportunities".

The decision to either adopt or reject information technologies within an organisation is generally influenced by the manager. Studies on EC adoption typically assess the various environmental, organisational and technological characteristics that facilitate or inhibit adoption.

The various organisational factors that influence the adoption of IT are: support from top management (attitude); size of organization; quality of information system (IS); user participation; product champion; and technical skills. When there is commitment from top management, managers will ensure that the resources necessary for implementing the innovation are available (Perez, Martinez, de Luis & Vela, 2005; Pdilla-Melendez, 2007). Akbaba (2006) found that the technological skills of managers in hotels, the number of years computers had been used by the business, and the size of the business, all had an influence on the decision to use computers.

1.2 Background and Context

The hotel industry has always stressed the importance of providing customers with excellent service. Hotels are increasingly using computer-based IT facilities in order to enhance operational effectiveness, improve service quality and cut down on costs. In addition, the increasing need for intensive information from hotel practitioners and customers has forced the hotel industry into a greater reliance on IT systems (Zhu & Kraemer, 2005; Stanko, Bonner & Calantone, 2007; Liang, Chen & Wang, 2008; Vadell & Orfilla-Sintes, 2008). Hotel managers, in general, anticipate that their businesses, their financial returns and their profit margins will improve because of the use of IT.

Customers are more interested than before in product-associated information so that they can minimise their buying risks and also close the gap between their expectations and their actual travel experience (Liang *et al*., 2008). It was initially believed that one benefit of IT

would be the Internet, adding to the distribution channels available to hotels. In other words, IT would enable the hotels to promote themselves directly to customers and thus sell their rooms more cheaply than if using expensive call centres.

South Africa, which is considered a developing country (Molla & Heeks, 2007), has not, been adopting EC, and their level of service has therefore not increased (Barros & Dieke, 2007). It is important to find out what is limiting or constraining the adoption of EC in developing countries. Previous studies have indicated that hotels do not want to lead in terms of implementing new technology (Pitt, Cyr & Campbell, 2008)**.** Tarafdar & Vaidya (2006) state that the hospitality industry tends to lag behind in using IT applications. One of the reasons could be that the technical knowledge of most hotel decision-makers is fairly limited as a result of their not having received any IT training. Chathoth (2007) states that the low level of IT knowledge of managers causes hotel managers to fear technology; it also contributes to hotel managers being resistant or reluctant to use new technologies; the managers claim that technology will negatively affect their work of availing personalised services to hotel visitors, which is an indication of how little they know of the benefits of IT. Tarafdar & Vaidya (2006) comment that this means hotel businesses will continue to be at risk of IT problems because of the poor technical expertise of their managers.

1.3 Extent of Adoption of Electronic Commerce

Theoretical discussion

The extent of EC adoption refers to "the degree to which EC has been adopted or used in an organization" (Lin, Huang & Tseng, 2007: 808). Electronic commerce could be used for selling and buying only. Yet, there are other activities, such as internal processes and businesses trading with other businesses, that companies use to support their hiring, buying, planning and selling, that which require EC. In the present study, the degree of EC adoption focuses on organisation processes. Wu, Mahajan & Balasubramanian, (2003: 428) developed a model that divides EC into the following processes: communication, internal administration, order taking and procurement. He goes on to define each process as follows:

> "Communication: Exchanging information with customers, suppliers or within the organisation; Internal Administration: Conducting internal activities within the organisation; Order Taking:

facilitating transactions with customers; and Procurement: Linking with suppliers to purchase input materials".

Wu *et al.* (2003) measured the extent of adoption of EC using fifteen elements for internal, inbound and outbound communications, three elements for internal management procedures, three elements for order-taking procedures and four elements for procurement procedures. For the present study, seventeen items were utilised in measuring the extent of adoption of EC. Five items were utilised to measure B2C outbound communication, four items for B2C order-taking, B2B inbound communication and four items for B2B outbound communication. In total, 17 items were used. As there has been technology innovation, some of the items used by Wu *et al.* can now be put together, thus reducing the number of items used.

1.4 The Study's Variables:

Tornatzky and Fleischer's technological, organisational and environmental (TOE) model

The TOE model is an important design for providing the contextual factors within the present study (Tornatzky & Fleischer, 2003). The TOE model suggests that the following three aspects influence an organisation's decision as to whether or not to adopt a new technology: (1) the technological context, which includes relative advantage, complexity and compatibility of technologies adopted by the organisation; (2) the organisational context, which describes the uniqueness of a firm, the attitude of its management, the quality of its human resources and its size; and (3) the environmental context, which describes the firm's industry, its information intensity, and its business with its competitors, suppliers and customers (Tornatzky & Fleischer, 1990).

Zhu, Kraema & Xu, (2006) demonstrated the effectiveness of the TOE framework with regard to accepting the diffusion of innovation. The TOE framework is used in the present study because it helps strengthen the diffusion of innovation theory (DIT), which focuses on the technological part alone. The TOE model looks at the technological and organisational conditions of a potential adopter. There is proof (Yiu, Grant & Edgar, 2007; Vadell & Orfila-Sintes, 2008; Murphy, Schegg & Olaru, 2006) that e-business is encouraged by the technological development of the Internet, which, in turn, is driven by

organisational factors (for example, the organisational size and scope) and encouraged by environmental factors (i.e. one's customers, business partners and competitors). It is thus necessary to synthesise the TOE framework with the DIT theory.

Tornatzky & Fleischer (2003) suggested and defined the following three factors as affecting organisational innovation:

Technological factors – which describe both the internal and external technologies relevant to a firm. These include the existing technologies within the firm as well as the pool of other technologies within the market.

Organisational factors – which are defined in terms of several measures: the amount of resources available in the organisation, the quality of its human resources, and the firm's size, formalisation and scope.

Environmental context – which is the arena in which a firm conducts its business (i.e. the industry, its access to the resources supplied by others, its competitors and its dealings with the government).

1.5 Problem Statement

As a result of EC within the banking industry, any organisation can now transfer money, check their account balances, pay bills and collect receivables electronically, all of which helps an organisation ultimately to reduce its operational expenses and institute greater control over its bank accounts. Ritka (2007) mentions that, in Bangladesh, owners of SMMEs have to visit their lenders an average of fifteen times in order to transact a single loan, but, in developed nations, organisations can apply for loans and do their banking online (Riyadh, Akter & Islam, 2009). Customers prefer EC because of its convenience and speed, its round-the-clock services and the fact that it can be accessed from anywhere in the world (Cheng, Sheen & Lou, 2006). Electronic commerce can benefit banks by lowering their transaction costs: e-banking requires fewer staff, fewer physical branches and there is less paper work (Cheng *et al*., 2006). Electronic commerce also leads to higher levels of customer satisfaction and loyalty (Gelhling, Turner & Rutherford, 2007). With EC, all the buying and selling of an organisation takes place online and all payments can

be made through electronic banking, which is one of the sectors of EC. In terms of the manufacturing industry, EC can enhance a company's global competitiveness, increase its access to global markets, help it attain a competitive edge, assist it keep pace with its competitors and increase its cost savings (Whitla, Walters & Davies, 2007).

While the adoption of EC has been the focus of considerable research within other industries, no study has as yet been undertaken about the adoption of EC within the hotel industry in South Africa. Technological, organisational and environmental factors will be examined in this study in order to show how each factor influences the extent of adoption of EC within the hotel industry in South Africa. Information will also be sought about those factors that hinder the adoption of EC by hotels in South Africa.

1.5.1 Sub-problems

Several studies (Brown, Collins, Maleka, Morrison & Muganda, 2007; Kartwi & MacGregor, 2007; Lin, 2008) used a number of determinants to assess the degree to which technological factors influence the extent of EC adoption. In this study, the determinants that are used are: relative advantage, compatibility and complexity. It is, therefore, important to assess if the perceived relative advantage, compatibility and complexity of the industry have a positive relationship with the degree of adoption of EC in Business to Business (B2B) inbound and outbound communication, Business to Consumer (B2C) communication, and B2C order taking.

There are a number of factors that influence the extent of adoption of EC in an organisation. The determinants that will be used with regard to the organisational context are: organisational size, attitude of managers and technological knowledge. Managers are the ones who make an organisation's critical decisions (Lin & Lee, 2005 and Turban, Lee, King, McKay & Marshall, 2008), hence, this study looked at the managers' characteristics (attitude and IT knowledge). Yang & Fu (2009) also found that managers' characteristics and organisational size are the most prevalent barrier to e-commerce adoption; that is why they are used as determinants of EC adoption so as to ascertain the influence they have on the extent of EC adoption in the hotel industry in South Africa, in B2B inbound and outbound communication, B2C communication and B2C order taking.

Environmental context is the arena in which a firm conducts its business; it has to do, for example, with competitors, information intensity and dealings with other businesses. It is, therefore, important to assess whether or not competition or the information intensity of the hotel industry in South Africa have a positive relationship with the overall extent of EC adoption. It is important to establish the degree to which the overall extent of adoption of EC can be predicted from technological, organisational and environmental factors.

1.6 Research Objectives

To examine the impact of the determinants of EC adoption, the following objectives have been set:

Objective 1: To discover the relationship between each of the technological factors and the extent of EC adoption.

Objective 2: To determine the relationship between each of the organisational factors and the extent of EC adoption.

Objective 3: To ascertain the relationship between each of the environmental factors and the extent of EC adoption.

Objective 4: To find the factors that can predict the extent of EC adoption based on technological, organisational and environmental factors.

1.7 Research Questions

In order to establish the impact of the determinants of EC adoption, the researcher posed the following research questions:

Q1: Is there a relationship between each of the technological factors (i.e. relative advantage, compatibility and complexity) and the extent of EC adoption?

Q2: Is there a link between each of the organisational factors (i.e. organisational size, attitude of managers and technology knowledge) and the extent of EC adoption?

Q3: Is there a connection between each of the environmental factors (i.e. competition and information intensity) and the extent of EC adoption?

Q4: What are the determinants that predict the overall extent of EC acceptance based on technological, organisational and environmental factors?

1.8 Research Methodology

A quantitative research design has been used for the present study. For the data collection process, a correlational and descriptive research survey has been used. Surveys allow for the collection of large amounts of data within a short period of time. According to Creswell, Ebersohn, Ferreira, Ivankova, Jansen, Nieuwenhuis, Pieteren, Plano Clark & Van der Westhuizen (2008) and Gay, Mills & Airasan (2008), if the population size is of the order of 1500, 20% should be sampled. The number of hotels in SA is estimated to be approximately 1500 and therefore a sample of 300 questionnaires was needed for the study; 332 questionnaires were collected. The participating hotels were drawn from the database of three groups of hotel listings that were suggested by the South African Tourism office (the Tourism grading Council hotel listing, the Tshwane accommodation listing and the AA travel accommodation listing). The researcher used random sampling for each of the three groups identified to make sure all three groups were sampled.

To answer each of the research questions, Pearson's correlation analysis and Spearman's correlation were used to assess the relationship between the manager's perceptions of each

of the variables. Frequency and descriptive statistics were used to measure the means of the independent variables and find out what participants say about each of the variables and standard deviation. Finally, multiple regression was used to measure the extent of overall adoption prediction.

1.9 Importance/Significance of the Study

This study will apply technological, organizational and environmental theory (Tornatzky & Fleischer, 2003) to the South African hotel industry. This theory has not yet been used to test the hotel business in South Africa. It is expected that the study will also raise awareness about EC amongst hotel managers generally and help them to design hotel strategies around IT development.

The South African Ministry of Economic Development is expected to increase its GDP through tourism. In 2008, the earnings from international visitors was expected to be ZAR 94.7bn ($13.4bn) and it is expected to grow to ZAR 223bn ($26.9bn) in 2018 (Tourism Satellite Accounting, 2008). The study will therefore help the South African Tourism Industry in that it will provide a practical analysis of the possible advantages of IT applications that could be used by the hotel industry in order to encourage more visitors to come and stay in South Africa.

Finally, the study will be of value to hotel managers and information technologists by identifying the gaps, in terms of what needs to be done, in the area of IT within the South African hotel industry. It can also be used to advocate the significance of IT use in the hotel industry and stress the importance of hotel managers in being competent in IT, in order to take full advantage of the possible benefits offered by technology adoption.

1.10 Organisation of the Study

Chapter 1: The introduction and background of the topic, as well as research questions and objectives of the study. The importance of the study is also discussed.

Chapter 2: This includes the literature review, and further discusses the determinants of EC adoption in hotels that are used to test the model.

Chapter 3: Conceptual framework of the study is discussed, based on TOE theory as well as DIT.

Chapter 4: This presents the research methodology employed in this study. The research design is discussed in terms of methods, context, variables and procedures. It provides a description of sample respondents, data collection procedures and measures of constructs.

Chapter 5: In this chapter, the results of the study are presented. It describes the analysis used to test the model and various research questions in this study.

Chapter 6: The analysis and findings on each of the EC determinants are discussed.

Chapter 7: Limitations, recommendations and conclusion are discussed and future research on the topic is suggested.

1.11 Conclusion

In conclusion, the chapter discussed the importance of EC as a business tool and its effect on the hotel industry. The chapter further discussed the constraints faced by developing countries in the adoption of EC. The TOE model was introduced, even though it is discussed in detail in chapter 3. The TOE model is used because it strengthens the diffusion of innovation theory, which looks at the technology and does not discuss the organisation and the environment and yet also influence the decision to adopt.

The problem statement was introduced. It indicates that, even if EC adoption has been looked at in previous studies, it has not yet been discussed pertaining to the hotel industry in South Africa. Sub-problems were discussed based on the technology, organisation and environment. Each sub-problem is based on the TOE which led to the four research questions and the objectives of the study.

The chapter then gave a brief summary of the research methodology stating the number of hotels and the sample size. The sampling method was mentioned. How each research question will be answered using the statistical tools was also outlined.

Finally, the chapter concludes by stating the importance of the study and how it will contribute to the body of knowledge. To end this chapter, the organisation of the study is mentioned.

The next chapter will give an overview of relevant literature, which includes literature on electronic commerce in general and electronic commerce in South Africa in particular. The study is on EC in the hotel industry; therefore, this chapter will discuss the hotels and technology in general, and then consider hotels in South Africa. Finally, the next chapter concludes by presenting the determinants of electronic commerce, which will have been identified by the researcher through the literature review.

2 CHAPTER: LITERATURE REVIEW

2.1 Introduction

With the advent of globalisation, the implementation of Internet-based technologies has become a common and very important trend. Information technology plays a crucial role in achieving business targets (Ayalew, Lessa & Yigzaw (2010). Each and every country is ranked according to its level of IT usage (Tarafdar & Vaidya, 2006). It is important to identify the level of adoption of technology a country has so that businesses know what to expect from that particular country.

This study will focus on the determinants of electronic commerce (EC) adoption in the hotel industry in South Africa. Firstly, innovation and adoption will be discussed in this chapter because, before an organisation can use Electronic commerce, it must first adopt the technology that has been innovated. Electronic commerce will then be introduced and the greater part of the discussion will be on EC adoption within South Africa. Hotels and technology acceptance will be looked into in general, but the South African sector will receive specific attention. Finally, the determinants of EC adoption will be evaluated. The chapter will also present a review of all the related literature about the determinants of EC adoption.

2.2 Innovation

The major mechanism for growing the technological capability of a firm is innovation (Brandberry, 2003). Innovation is defined as the adoption of an idea or behaviour that is new to the adopting organisation (Rogers, 2003). The innovation can be a new product, a novel service, an original way of doing things, a new technology or a different market. The perceived ease of adoption can influence adoption behaviour, since an innovation that is seen to be easy to adopt and use can reduce the time and effort required to invest in the project, and, thus, increase the likelihood of an establishment adopting that technology. In addition, innovation is related to change, which can be either incremental or radical (Harkema, 2003). Hence, it is necessary to distinguish some of the types of innovation that stem from the theory of innovation in services, with reference to the peculiarities of the hotel industry. Damanpour & Wischnevsky (2003) state that innovation can be classified into four sub-categories, which are: (1) radical innovations, (2) technology-pushes, (3)

planned innovations and (4) market-pushes. Based on Thong's (1999) classification, Damanpour & Wischnevsky's (2003) classified EC as a process, technological-push and market-pull or planned innovation. Brand & Huizingh (2008) classify information systems innovations into three types: those that are confined to the technical task, those that support the administration of businesses, and those information system innovations that are embedded in the core technology of the business. Based on Brand's classification, Wu *et al.*, (2003) view EC, as an information system innovation rooted in the main technology of the organisation. The focus of the present study is the adoption of EC which can be considered as a form of information system that is embedded in the core technology.

Information system researchers have anticipated EC would be an organisation-wide technological innovation (Jackson & Harris, 2003; Lin & Lee, 2005) offering businesses the opportunity to establish good networking relationships with business partners, such as wholesalers, service providers, suppliers, distributors, end-user customers and logistics providers. These improved networking relationships will increase the organisation's access to communication at a very low cost and improve its operating efficiency.

Furthermore, a firm is more likely to adopt a technical innovation than maintains the *status quo* if the innovation promises greater organisational benefits (Carayannis & Turner, 2006). An organisation's capacity to absorb the latest technologies is influenced by (1) its overall capacity to measure technological opportunities in fields of activity relating to new production techniques, and (2) the learning effects from the use of a technology, the experience with a specific technology or more advanced technologies (Kumar *et al*., 2008). These two elements should be positively related to early and thorough use of IT.

Carayannis & Turner (2006) state that innovation takes the form of a three-way process. Initially, the individual has to be exposed to an innovation but lacks information about the innovation. The next process is that the individual is interested in the innovation and seeks information. The third stage is when the individual takes the concept and decides whether to adopt or not; the individual then implements the innovation and wants to try it out. Finally, the individual concludes whether to continue with the innovation or not.

Orfila-Sintes, Crespi-Claredera & Martinez-Ros (2005) state that innovations in the hospitality industry are mostly about putting into practice the latest or, at least, a

considerably better service, delivery system or new service production. According to these researchers, the management innovations that are adopted are about putting into practice new organisational arrangements or new job profiles. Orfila-Sintes *et al.*, see innovation in hotels as being those "technological changes that are strategically implemented in the key areas, departments and services of hotel establishments" (Orfila-Sintes *et al.,* 2005:383). Technologies that are developed internally or have been commercialised by suppliers should give the hotels that use them a competitive advantage, albeit because of the increased productivity and efficiency that they offer, the manner in which they help decrease costs or the greater capacity for differentiation that they afford.

Based on other innovation concepts, Tornatzky & Fleischer (1990) conceptualise innovation acceptance as consisting of three areas, namely: (a) the technological perspective (b) the organisational perspective and (c) the environmental perspective. As the TOE theory can be used in the context of any organisation and along with previous theories such as Diffusion of Innovation Technology, Tornatzky & Fleischer's TOE theory has been applied to the present study.

2.3 Electronic Commerce

The term 'e-commerce' (EC) emerged some time ago (Schneider, 2007) when businesses started to realise that the Internet is a powerful medium for conducting business. Researchers (Sahadev & Islam, 2005; King *et al*., 2006; Kshetri, 2007; Molla & Heeks, 2007; Schneider, 2007) believe that Internet-based EC goes beyond simply the electronic buying and selling of products and services, because it involves a wide variety of pre-sales and post-sales activities such as advertising, maintaining business relationship and enhancing business communications (Schneider, 2007). Kshetri (2007) defines EC as the use of electronic communication and digital information processing technology in business transactions to create, transform and redefine relationships for value creation between or among organisations, and between individuals and organisations, which is similar to Beynon_Davies (2004) who defines EC as any form of business, administrative transaction, or information exchange between the organisation and the outside world that is executed using any form of ICT. Kaefer & Bendoly (2004) also define EC as pertaining to any form of business transaction in which the partners interact electronically rather than by physical exchanges or direct physical contact meaning that EC is the application of ICT.

EC has been described as the process of selling, buying, exchanging products or transferring, and is broken down and explained by Turban *et al.*, (2006:4) as follows:

Communication Perspective: "EC is the delivery of information goods, services or payments over computer networks or by any other electronic means."

Business Process Perspective: "EC is the process of doing business electronically by completing business processes over electronic networks."

Service Perspective: "EC is a tool that addresses the desire of governments, firms, consumers and management to cut service costs while improving the quality of customer service and increasing the speed of service delivery."

Learning Perspective: "EC is an enabler of online training and education in schools, universities and other organisations, including businesses."

Collaborative Perspective: "EC is the framework for inter and intra-organisational collaboration."

Community Perspective: "EC provides a gathering place for community members to learn, transact and collaborate."

At the centre of EC, however, is the utilisation of electronic methods to speed up business communications and increase competencies in industry practices, within and across organisations (Zhu & Kraemer, 2005). Depending on the parties involved, EC can be classified according to the following transactions (Turban *et al.*, 2006):

Business-to-Consumer (B2C): this is the selling of goods and services to individuals.

Business-to-Business (B2B): this is the buying and selling of goods and services between businesses.

Consumer-to-Consumer (C2C): this is where the consumer sells directly to other consumers and uses an electronic network to advertise items for sale or a service.

Consumer-to-Business (C2C): this is where individuals sell products or service to organisations via electronic transactions and communications.

Government-to-Business (G2B): this is where a government entity buys or provides goods, services or information, from or to businesses.

The present study examines those EC activities that relate to B2B and B2C; this is done so as to assess the degree of acceptance of EC by hotels in South Africa, as was stated in Chapter 1. A study conducted by Kaefer & Bendoly (2004) shows that businesses have to combine organisational, technological and brand-related aspects into the aim and building of their EC enterprises. This combination is necessary for the interdependence of the components of the organisational arrangement, as well as the promotion of the associated IT construction, which EC appears to improve.

EC can enhance one's competitiveness, offer better access to markets, provide increased business opportunities and contribute towards economic growth. Most businesses in developing countries lack knowledge on how to develop a competitive edge and how to invest in EC, so that their organisations will benefit from it (Xu, Zhu & Gibbs, 2004). However, Tarafdar & Vaidya (2006) claim that organisations in developing countries are already using EC, and that this can be seen by the technical and communication infrastructures of these countries. However, in certain countries (Ethiopia and Nigeria, for example, where people believe in receiving hard cash instead of using credit cards (Ayalew *et al.,* 2010), the absence of advanced technologies contributes towards the failure of EC. Online selling and shopping websites have all been designed to ensure there is growth in the usage of EC but it becomes difficult with countries that want to pay cash or receive cash. Some establishments have discovered new methods of selling and have identified better strategies, such as e-payment through cell phones, which play an important part in the sustainability of EC in developing countries (Ayalew *et al.,* 2010). However, Molla & Licker (2005) state that, in many developing countries, personal contacts in businesses are still more important, and that people prefer talking to other people face-to-face than sending emails. Although we do not want to equate sending emails with EC, it is important to note that personal contact is important, both in daily life and in a business environment.

Business-to-Business (B2B) EC

King *et al.,* (2006) define B2B EC as dealings between businesses that are conducted electronically, over the Internet, via intranets, extranets or through private networks. B2B EC is sometimes called e-procurement because some departments, devoted to negotiating purchase transactions with their suppliers, are called supply management or procurement departments (Schneider, 2007). Business-to-business can be conducted without the Internet but in the present study, the term B2B has been assumed to mean B2B EC. The study looks at the organisations that are using electronic commerce to automate trading or communication processes in order to improve their organisations. The main issue for B2B is the availability of a reliable broadband Internet platform, which is the problem in developing countries (Molla & Heeks, 2007). In South Africa, however, B2B is well established in terms of the acceptance of value-added networks and electronic data interchanges, which have created a base for B2B EC. Electronic commerce has developed very quickly in South Africa, because the country has an advanced and sophisticated computer industry that puts it in a good position to achieve productivity benefits from technology (Essselaar & Miller, 2009).

Business-to-Consumer (B2C) EC

King *et al.,* (2006) describe B2C EC as retail transactions of products or services from businesses to individual shoppers. Schneider (2007) defines it as transactions conducted between shoppers and businesses via the web. Business-to-consumer is the most widely recognised form of EC, as it includes online purchasing and other relevant electronic transactions that reflect the direction of delivery from B2C (Schneider, 2007; Gummesson, 2004). The Internet provides a way for consumers to make better purchasing decisions as it offers consumers relatively more information about products as well as alternatives from which to choose. If hotels increase direct B2C transactions by offering online reservation, consumers can choose which hotel to go to by looking at the products being offered on the website. Hotels will be the ones to sell their rooms, thus increasing the hotels' profits and removing the commissions and other fees charged by intermediaries. Because of the increase in B2C transactions, there will be an increase in consumer loyalty and trust which means the hotels have to implement and invest in the most recent technologies for their websites so as to encourage user acceptance (Gounaris, 2005).

The South African tourism industry is a well-known online advertiser that specifically targets international clients. Some well-known portals, such as E-Bay, promote and sell a number of goods to South Africa. South Africans also use other overseas sites, such as Amazon.com, to buy products and services (Brown & Jayakody, 2008). Most of the companies that are listed on the South African stock exchange have designed their websites so as to show the goods the company sells. While technology is in place in South Africa, there are fairly high telecommunication costs, which place a significant restraint on B2C EC (Jobodwana, 2009).

According to Research (2002), consumers were expected to spend US$ 329 billion online per year by 2010. The research estimated that the number of US households that made purchases online would increase from 39% in 2006 to 48% in 2010. Although it is estimated that B2C EC constitutes around 2.2% of all US retail selling, the rate of increase of online buying is three times faster than the increase in overall retail sales. The reason for this rapid growth is that shoppers find that many products and services are not as expensive when bought through the web, because the process eliminates costly intermediaries (Stair & Reynolds, 2008; Lin, Huang & Burn, 2007). In South Africa it was estimated that in 2008 online food purchasing would be US$2.4 billion on grocery market (McClatchey, Cattel & Mitchell, 2007).

2.3.1 The Status of Electronic Commerce in South Africa

Africa consists of many of the least developed countries in the world (Musa, Meso & Mbarika, 2004). The African Information Society Initiative (AISI) has identified EC as advancing social and economic development within Africa. As a result of the help received from international corporations and donors, a number of African countries (such as Kenya, Botswana and Ghana) have started working on projects to formulate and implement ICT policies and strategies that pay special attention to EC (Musa *et al.,* 2004).

Musa *et al.,* (2004) and Riyad *et al.,* (2009) state that one economic indicator of growth in a developing country is the degree of EC usage by businesses in that country. The acceptance of EC in developing nations is low compared to developed countries. Developing countries frequently lack the necessary infrastructure and finances for the expansion of EC. The EC models used by developed countries tend to have limited

transferability because of diverse cultures and business beliefs (Musa *et al.*, 2004; Orfila-Sintes *et al.*, 2005; Riyad *et al.*, 2009).

What is the reality of EC in Africa? There is very little information about EC on the African continent, with the exception of South Africa. According to Esselaar & Miller (2002), developing countries face a number of obstacles in terms of EC, but some of these obstacles can be avoided. Electronic commerce in Ethiopia is still in its infancy (Ayalew *et al.*, 2010), with only a few organisations using IT in their business transactions. A number of developing countries, however, are cash-based, and credit cards are non-existent there. Yet, credit cards, which are used in B2C EC, are taken for granted in developed countries. The banks of developing countries need to create an EC financial environment that is user-friendly so that their customers use credit cards and the country can move beyond being a cash-based economy (Ayalew *et al.*, 2010). Another obstacle to EC in developing countries is limited bandwidth because offline and online tele-services demand that there be high quality and fast networking services (Esselaar & Miller, 2002). Transportation and delivery systems are also a problem in developing countries, as they are not developed enough to facilitate Internet-based instant orders, which need to be followed up with quick delivery of the goods. Esselaar & Miller (2002) claim that virtual goods like music are easy to deliver. However, it is physical goods that create a transport problem in developing countries as airfreight is expensive and customs clearance procedures are complex. The people in developing countries who are required to implement EC have to be oriented towards the digital economy and language of the web. It is, therefore, clear that there are relatively few obstacles to B2C EC in terms of virtual goods and tele-services, but the African business environment is presently still hostile when it comes to B2C EC in physical goods.

South Africa is considered to be one of the top developing countries in the world in the sense that IT people trained in SA are lured to other countries (Esselaar & Millar, 2002). South Africa is far ahead of other African countries in terms of IT. It has a diversified economy, which creates a culture that encourages the development of skills in Information Communication Technology (ICT). South Africa, with its history of extensive IT use, is in the best position of all the African countries to take the most advantage of IT.

Moodley (2003) stated that EC existed in SA in the model of an Electronic Data Interface (EDI) and was generally used for 'main' dealings (i.e. mutual trade between customers and suppliers of large orders). Companies used EDIs to perform a limited information flow, for example, placing orders and checking material availability. Moodley further mentioned that corporate Internet use focused- largely on general email correspondence. There was limited use of the Internet at the time of Moodley's study for ordering goods, acquiring technical information, making electronic payments, receiving orders, receiving electronic payments, drawings and designs. Moodley claimed that most firms in SA were unable to support EC ventures at that time because they did not have integrated customers, and suppliers of ICT interfaces. Today, South African establishments have adopted EC but it is under-utilised, and these organisations thus incur high costs because of the inefficient use of the technology that is available to them.

However, a study by Esselaar & Miller (2002) state that international survey organisations predicted that online shoppers in South Africa would spend US$ 443 million in 2009 on Internet-generated purchases, and business-to-business EC would reach almost US$ 620 million in the same year. In 2010 consumers were more familiar and comfortable with online shopping and the spending increased to R2 billion (Goldstuck, 2011). In 2001, online sales in South Africa in the retail industry represented R162.6 million. There are a growing number of online South African consumers purchasing products, over the Internet. In 2003, 35% of retailers in South Africa were using the Internet to trade online and the total amount spent on shopping online that year was R341 million. Online retail sales represented 0.14 per cent of the South African retail market in 2003 (McClatchey *et al*., 2007).

A study was conducted by Molla & Heeks (2007) on developing countries, and South Africa was chosen to be part of the study because it has a moderate degree of EC, not because it is representative of all developing countries. In an earlier study that was conducted by Moodley (2003) in South Africa, it appeared that some firms were already at the experimentation level and some organisations had started to explore the possibilities of EC. In the study by Molla & Heeks (2007), firms that had made some use of EC were asked to respond. It was found that the firms did not even know what the advantages of EC would be for their businesses. The majority of businesses, according to Molla & Heeks (2007), did not appear to be improving their contact with suppliers or customers, initiating

cost reductions and other benefits, or expanding their access to markets. There was no apparent reduction in transaction costs and no market performance. United Nations Conference on Trade and Development (UNCTAD) (2005) argues that EC provides producers in developing countries with the ability to: improve data transfers between a firm and its suppliers, streamline the procurement operation, and expand and extend existing markets. It is true that EC provides one with the means to optimise one's business processes by making data transfers (UNCTAD, 2004). However, this was not found to be the case in the study on South Africa by Molla & Heeks (2007); in Molla & Heeks' study, the only EC benefit that firms reported was an improvement in basic communication. It is unsurprising that the only benefit was communication because Moodley (2003) found that the Internet was only used for email correspondence. Businesses were not using the tools that were available to them, such as e-payment, ordering and receiving goods. There has been no confirmation that EC is delivering specific business benefits, even though it may be producing some benefits. Fitzgerald, Papazafeiropoulou, Piris & Srrano, (2005) have reported that organisations in industrialised countries appear to be enjoying EC benefits. However, Molla & Heeks (2007) state that, in developing countries, the effects of EC will not always be positive. Molla & Heeks's claim that a number of organisations based in developing countries have been unsuccessful in achieving the profits obtainable by new technology. It can, therefore, be concluded that businesses in developing countries may not be able to penetrate industrialised markets, while organisations in developed countries, through the advantages of EC, are able to penetrate markets in developing countries.

A number of B2B marketplaces have been launched in South Africa since the year 2000. For example, "Quadrem was established as an electronic marketplace that serves buyers and sellers in mining metals and minerals and provides sourcing catalogues and transaction processing" (Elliot & Boshoff, 2005: 97). One of the largest banks in the country – the Standard Bank of South Africa – launched online procurement marketplaces as well as the Trade Standard.com in 2001, with Ariba US as its technology partner (Elliot & Boshoff, 2005).

Over the past two decades, EC in South Africa has developed remarkably fast. This has been the result of the country's understanding that online supply chain management and procurement can improve customer relationships as well as cut down costs (Wynne *et al.*, 2001). South African institutions that do business globally (and which are mainly involved

in financial e-services, mining, chemicals and manufacturing) have been trying to meet the expectations of global customers (Hawk, 2004). Development in EC in South Africa has been shown in the procurement of marketplaces, transactions processing and systems integration. Consumers have also become knowledgeable and are increasingly accustomed to automation and developing a self-service mentality (Wynne *et al.*, 2001). South Africa's most quoted success story, and its leading EC business, is the online sales of airline tickets. The value of these tickets reached R1.8 billion in 2005. Other online retail marketplaces include Kalahari.net, which supplies a variety of products online, and Pick 'n Pay retail stores, which supply an online grocery ordering service (Esselaar & Miller, 2002).

The use of online banking in South Africa is common; large banks like First National Bank and Nedbank offer complete business and individual online banking facilities, as well as payments and a variety of cash and portfolio management services, account reviews and transfer bill presentations (Elliot & Boshoff, 2005). Also, South Africa has enacted the e-Communications and Transactions Act (2002), which presents a legal framework for e-business contracts with cryptography and the security of privacy (Jobodwana, 2009). This legislative reform resulted in the adoption of the e-Communications Act (2006), which controls convergence within the ICT sector.

There are many South African companies that have already invested in, or are planning to invest in, IP services and VoIP. In a study by Tobin & Bidoli (2006), it was found that, for new entrants and infrastructural investments, the market for VoIP and converged IP services is ripe. The researchers further argued that businesses can increase their market reach if they use EC as well as execute a bulk customisation approach to match the requirements and preferences of individual customers.

In 2009 Internet users were 5.3 million in 2009 (Internet World Stats, 2012). This has resulted in the South African government being committed to increasing customers' ease of access to the Internet and cutting down the cost of bandwidth, which has been relatively expensive in South Africa and, as such, has affected the country's rate of economic growth. Jobodwana further states that, in 2008, cabinet approved laws to allow for the formation of Infraco, a new state-owned company. The purpose of Infraco is to supply a broadband facility through fibre-optic cables to other telecommunication operators in the country. The role of Infraco is to complement the state-owned signal providers, such as

Sentech, by supplying the public sector with greater Internet connectivity through the use of fibre-optic cables (Jobodwana, 2009). The number of dial-up subscribers has declined dramatically from the time Infraco was introduced, while the number of broadband subscribers has been increasing, meaning that most of the subscribers are switching from dial-up to broadband (Internet World Stats, 2012). In December 2010 there were 6,800,000 Internet users and in December 2011 there were 4, 822, 820 facebook users (Internet World Stats, 2012).

Electronic commerce in South Africa represents a chance for the country to catch up with the current pressure of globalisation and its related challenges, and also connect with global markets. The challenge to expand to overseas markets and the pressures of globalisation and trade liberalisation underscore the value of EC for businesses. There is a need for firms to integrate ICTs in their operations, if they have not already done so, in order to become involved in EC. South Africa has to face the EC challenges systematically, both at the economic and industrial levels, otherwise it could lag behind in industrial development. Electronic commerce development is expected to be evolutionary than revolutionary in much of the developing world, like South Africa (Molla & Heeks, 2007).

2.4 EC Adoption

The extent to which EC has been adopted and used in other sectors has attracted the attention of the tourism industry. The adoption and use of EC by the tourism industry has not been uniform, but rather it has varied in different countries and among different businesses. Electronic commerce adoption has been considered in a number of ways and a variety of methods have been developed to increase EC adoption (Kaynak, Tatoglu & Kula, 2005). Some firms do not have a proper understanding of an innovation, but they jump onto the proverbial bandwagon nevertheless, implementing a new innovation on the basis that other organisations have implemented it (Wu & Lee, 2005).

The following are some of the reasons that have been recognised as often presenting a problem to those hotels wishing to adopt new technologies: (1) telecommunications infrastructure, (2) technical expertise, (3) management commitment and (4) being aware of EC opportunities, the demand for online services from customers and evaluation systems

(Wu & Lee, 2005). Joo & Kim (2004) and Doloreux & Melancon (2008) argue that EC adoption is influenced not only by the features of the innovation, but also by the organisation planning to adopt the innovation and certain external variables.

According to Naranjo-Gill (2009) and Ozturan & Roney (2004), EC adoption is influenced by organisational and environmental factors. Ozturan & Roney (2004) investigated the use of the Internet by customers of the hospitality industry. They claim that visitors from countries where EC usage is high were expected to use EC more than visitors from countries where the use of EC is low. Regardless of their country of origin, tourists may want to use EC and, if they are in the habit of using it at home, they will want to use it when they are away from home. Such tourists will also not want to make transactions manually. However, tourists who come from countries where EC is seldom used will most likely not see the point of using EC, even when it is available in the hotel, because they are unfamiliar with the processes involved in making electronic transactions.

The adoption of technology in the hotel industry is a complicated process and, as such, there are exceptional features to it and unique ways of assessing the technology adoption activities (Wang & Qualls, 2007). Murphy & Tan (2003) mention that hotels usually accept technologies in order to cut down on costs, develop greater operational efficiency and enhance the quality of their service. New IT is quickly changing old ways by offering additional, faster and more powerful tools for clients.

The hotel that adopts a proven technology does not make a high-risk decision. However, adopting a technology that has not yet been proven and has yet to be established is a decision that is relatively risky. The belief is that, if the technology has been in use for a long time, it is easier for it to be adopted by a hotel, since the level of risk linked with the technology has been established. The tendency of a hotel to adopt IT is considered by managers in terms of the type of technology that was introduced to the hotel at the outset. Lam, Cho & Qu (2007) state that highly rated hotels tend to accept innovation more easily than hotels that are not rated highly. Most of the hotels that have adopted the Global Distribution System (GDS) are rated highly.

Sahadev & Islam (2005) claim that hotels that have been in existence for some time are less likely to adopt the latest technologies. However, hotels that are relatively new are

much more interested than older hotels in adopting new technologies, such as e-checkout and Property Management Systems (PMS). They also found that long-standing hotels have often attained a considerable standing amongst their customers and therefore do not see the need to adopt new technologies to expand their market share. However, Khemthong & Roberts (2006), who studied the adoption by Thai hotels of Internet and web-based marketing tools, state that the situation in Thailand is different from that described in Sahadev & Islam's study earlier on. Khemthong & Roberts state that larger hotels are more ready for adoption and implement Internet technologies earlier than do the smaller hotels. The hotels that have been in existence for some time find that new technology encourages new customers and they are able to increase their market share**.** Burke (2005) and Levenburg (2005) are of the same opinion as Khemthong & Roberts, arguing that, when it comes to the effect of a firm's size on Internet usage, larger hotels are more ready to adopt new technologies than smaller hotels and age does not matter.

A survey conducted by Brown & Kaewkitipong (2009) in China established that technology is the second most important factor in the hotel industry, after environmental factors. They established that benefits like e-payment are associated with growth and that the possibility of increased growth definitely affects the EC adoption decision. Also, application complexity was found to be a major concern for hotels. In relation to organisational factors, Brown & Kaewkitipong found that hotels do not consider their size to be either a barrier or a facilitator to their decision to adopt IT.

According to UNCTAD (2005), companies and countries that focus on EC activities gain significant competitive and economic advantages. EC is usually encouraged as a means of enabling producers in developing countries to prosper, and developing countries are being encouraged to integrate themselves into the global economy. It is expected that, in the long run, EC initiatives will lead to better relationships between hotels and suppliers, the provision of better gross product margins, a reduction in inventory and better in-store availability. This trend is particularly noticeable in those nations that have a higher percentage of overall employment and whose gross domestic product (GDP) is dependent upon the hospitality industry. It is essential that nations that rely heavily on tourism promote the growth of innovative solutions and technological activities within the hotel industry.

Organisations that are likely to enjoy an immediate return on IT trading are those that have put a considerable sum of capital into web design and the creation of a sustainable network. Suppliers that refuse to use the Internet could well find themselves removed from the supply chain. When large companies start selling their services or products on the Internet, a ripple effect owing to the value chain is likely to occur. According to Moodley (2003), the value of EC in SA is that: (1) it increases the effectiveness of domestic processes, (2) it streamlines interim linkages and (3) it enables businesses to connect to global markets. The Internet can also perform a crucial function in EC in that it facilitates supply chain learning and innovation. EC Internet-based connections and real-time communications are expected to sharpen the competitive approach of participating businesses and develop the quality of the information embedded in industrial relationships (Moodley, 2003).

Adoption and usage of EC in developed countries has produced tremendous results with revenues in the travel and tourism industry (Brown, Hoppe, Mugera, Newman and Stander, 2004). EC could help achieve the potential of the African tourism industry thus increasing the in-flow of the much-needed foreign currency into their economy. A study was carried out by Maswera, Dawson and Edwards (2005, 2006) to find out if organisations in the tourism industry, in four African countries were adopting EC. The countries studied included South Africa. The results from the study revealed that although websites were comparable in terms of providing tourism product information to those of their counterpart in the USA and Europe they needed to be evolved into marketing tools for them to attract enough business for the tourism organisation to make an impact in their economies. The results also showed that although the accessibility and usability of African websites were comparable to those of the developed markets this was because African websites were relatively simple and lacked the more advanced features of their counterparts. The results also showed that many organsiations are not taking advantage of these technologies to fully embrace EC. A positive aspect showed that the organisations are aware of the capabilities and potential of EC and are planning to fully embrace EC if and when they manage to overcome the inhibitors and barriers to EC implementation.

2.5 Hotels

Fortunately, solutions are emerging that will once again give guests something to be excited about. Technology companies want to equip public spaces and guestrooms with the latest electronic appliances. Gansevoort Hotel Group in Miami Beach has teamed up with Sony, while Sheraton has teamed up with Microsoft to set up a new link at Sheraton lounges, where guests can check their e-mail, for example. The guests who walk into the hotel are the same consumers of Microsoft or Sony who use Microsoft or Sony in their homes (Stellin, 2008).

Establishing business links with technology companies makes it easier for hotels to remain up-to-date with new developments in technology. The argument of these hotels is that they want to give their guests the opportunity to use the latest technology. While hotels are busy with technology, they must also, however, make sure that guests do not wrestle with technology that is too complex for them (Stellin, 2008).

“The triple-play convergence of video” (Tobin & Bidoli, 2006: 31), voice and data over a particular network, is setting the stage for the next innovation in hotel technologies. In addition, guests will be able to receive a dial tone, make dinner reservations, have TV programming and Internet access, purchase theatre tickets, check their stock prices, key-in their specific wake-up calls and listen to almost any radio station.

To enhance the guest’s experience, hotel systems like Property Management Software (PMS), Customer Relation Management (CRM) software and others can be built on top of this triple-play converged foundation. To create a unique guest experience, a guest’s preferences can be tracked and preloaded to his or her room in advance. When a regular guest checks into a hotel room, the telephone system automatically assigns the TV menu, which is set according to that guest’s language and favourites, according to established customisation (Hospitality Technology, 2006). With respect to in-room technology, the hotel industry may possibly have lagged behind the standard guest’s home. The hotels that accept in-room technology development will probably be the ones that reap the benefits of higher occupancy rates (Barros & Dieke, 2007; Chong, 2006).

Hotels will soon be expected to provide in-room personal video recorder (PVR) resources or the capability to listen to or watch national channels from one's own country, when staying abroad. When a guest checks in, the desk clerk enters the guest's personal preference information into a terminal. The integrated systems can capture preferences such as room temperature and the type of music the guest enjoys. That information is then used to activate the room thermostat to the desired temperature and provide the preferred style of music (Hospitality Technology, 2006). The customer will have bought these facilities when paying for the accommodation. Customers will have stated what other products they want to buy when placing their orders electronically.

With all the technology that hotels now have to put at their guests' disposal, a challenge identified by some hotels is that they will have to increase their bandwidth in order to keep up with the increasing number of customers who are engaging in online activities. Developing countries have a bandwidth problem, and South Africa is no exception. Given the economic climate, hotels ought to concentrate on increasing their customers' Internet access as well as improving other critical technologies that would justify their charging a higher room rate and would help attract additional guests (Stellin, 2008).

2.5.1 Hotels and Technology

The Century Plaza hotel in the United States was the first hotel to have a colour television installed in every room, but since then there have been very few technological innovations within the hotel business (Pla-Barber & Alegre, 2007; Du, Love & Roper, 2007). According to Du *et al.*, and Pla-Barber & Alegre, the first computer-based hotel system was launched in the 1970s. The hospitality industry was able to shift the purpose of IT from internal processes and practices to also meeting customers' IT requirements. Hotels also started providing different services from their competitors, when motels and hotels of all sizes began to afford computer-based systems. As a result of information technology, hotels have changed the way they manage business. In the hospitality industry, an information system provides extensive reports for managers. EC has introduced competitive forces and innovative competitors have, at the same time, created new opportunities for hotels.

Software technologies, such as artificial-intelligence-based systems, are usually not adopted by hotels because they consider the software to be too advanced for the hotel industry (Rai & Patnakuni, 2006). Such software can assist hotels with their daily business processes or long-term strategies. The hotel manager's highest priority is to provide quality customer service (Kim, Xiaojing & Kim, 2006); it is not to strive to implement complex technology.

In order to stay in a competitive position in today's market, many hotels need to improve their operational efficiency, which can be done by upgrading and adapting to new technologies, because guests are becoming more demanding than ever. The lagging hotel must take into consideration the trends of business travelers if it wants to meet its guests' IT demands. Travelers obtain information about hotels in a variety of ways (Ozturan & Roney, 2004 and Stellin, 2008). Travelers that have not yet become loyal to a specific hotel, or who have become dissatisfied with their usual choice, will switch from one hotel to another until they are satisfied (Liang *et al.,* 2008). Hotels that quickly adopt improved IT systems are less likely to lose potential customers to other hotels that offer better facilities (Lam *et al.*, 2007 and Gazzoli, Kim & Palakurthi, 2008).

Wireless technology has become commonplace to many people and businesses. According to Orfila-Sintes & Martinsons (2009), the IT innovations that are being created for the hospitality industry are made with reference to the nature and preferences of frequent travelers. Businessmen tend to carry with them one or more wireless devices when travelling. Most of the technological devices that have been developed in the last few years have had a wireless device fitted into them or have been developed so as to be wireless friendly. Daily improvements are being made in terms of the speed and security of wireless technology.

The location of a hotel has a significant effect on its procedures and profitability. Hotels that are situated in a good location tend to have a better advantage than hotels that are situated in a place that is not attractive or is of no interest to tourists, for example, the Western Cape is a popular tourist destination compared to the Northern Cape. These variables have an influence on the decision of a hotel to implement IT or not. This decision can be associated primarily with a hotel's beliefs regarding the added value that IT can offer its clients (Ham, Kim & Seungwhan, 2005). Large hotels are the most likely to adopt

IT; a lack of resources in small hotels may well influence them not to adopt expensive IT innovations.

There is worldwide appreciation for the function played by technology in improving a hospitality organisation's competitive edge (Chathoth, 2007). Studies on technology diffusion and acceptance have shown that there is much awareness of this fact by businesses and academia involved in the hospitality industry. Hospitality organisations tend to concentrate on the ease of use of a technology rather than on the complexity of the whole adoption process. Chathoth (2007) argues that the adoption of technology by hospitality organisations is mostly influenced by the attitude of the managers. In addition, Chathoth suggests that there are other factors – such as environmental, organisational and innovation characteristics – that are important in terms of hotels deciding whether or not to adopt IT. In the process of making this decision, the influence of these factors may not be the same for every hotel.

The impact of IT and its importance in the infrastructure of the hospitality industry has strategic implications for hospitality leaders. The industry is becoming fully depended on IT systems and the industry is significantly altering operations (Hospitality Technology, 2006). Industry personnel and academic researchers have given attention to the impact that IT has had on the tourism and hospitality industry as well as its potential to make even more of a contribution to that industry. The implementation of IT systems in the hospitality industry has resulted in an improvement in consumer services, business operations, productivity and revenues for the organisation and consumers (Ham *et al*., 2005; Scarl, Wober & Bauer, 2004).

In order to succeed, hoteliers need to think more like retailers. Hoteliers have to realise how important it is to meet the customer's expectations; they cannot afford to just think of customers as "heads in beds" (Gazzoli *et al.,* 2008). The attitude or belief that innovation is a basis for competitive gain will fuel the propensity of a firm to adopt new technologies. In addition, the decision to adopt new technologies is also supported by factors related to a firm's internal abilities and requirements. It can therefore be seen that several factors (which could be internal, external or both) affect a firm's decision to accept or ignore a new technology.

For some of the developing nations, like South Africa and Mexico, the improvement of a hospitality organisation's technological support is very important. Such countries are particularly reliant on the hospitality industry, since they have recently become very popular tourist destinations.

2.5.2 Hotels in South Africa

The term *hotel* is defined by the Tourism Grading Council of South Africa (TGCSA) as "an establishment that provides accommodation to the travelling public and must have a communal eating area" (TGCSA, 2009). In the present study, however, a hotel is defined as any organisation that is registered as a hotel in South Africa, belongs to one of the groups that were used in this study's sample and meets the criteria set by the TGCSA.

During the apartheid era, the South African hotel industry was dominated by a few reputable and locally owned hotel companies. These hotel groups flourished because of a lack of competition. Today, a number of international hoteliers have invested in the South African market and hotels in South Africa have had to expand because of the competition coming from the international hoteliers (Van der Merwe & Wocke, 2007). According to Van der Merwe & Wocke (2007), there are twelve companies listed in the "Leisure and Hotels" companies on the Johannesburg Stock Exchange (JSE). These companies are said to control approximately 65% of the hotels in the country. The other 35% are said to be privately owned hotels.

In 2006, there were approximately 11,000 accommodation establishments within South Africa (Van der Merwe & Wocke, 2007). These establishments consisted of hotels, guesthouses, bed-and-breakfast establishments, game lodges and self-catering accommodation. A number of hotels in South Africa are situated in urban areas, such as in Durban, Cape Town, Pretoria and Johannesburg (Van der Merwe & Wocke, 2007). Of the 11,000 establishments mentioned, 1,000 were identified as being hotels according to the TGCSA (2009) definition. Towards the end of 1996, there were only 413 hotels. By 2006 this number had more than doubled, showing the rate of growth of the hotel industry. In 2009 there were about 1,500 hotels in South Africa, and this number was expected to increase because of the 2010 FIFA World Cup (TGCSA, 2010).

In 2006, the number of rooms in South African hotels varied from six in small hotels to 318 in large hotels. The study by Van der Merwe & Wocke (2007) revealed that the average number of rooms was sixty-seven and the average number of employees was seventy-three. The same study reported that the size of a hotel in 2005 was determined by the number of rooms and the number of its employees; this means of measurement will be used in the present study.

2.6 Determinants of Electronic Commerce

The original technology-organisation-environment (TOE) framework was developed for the study of the adoption of innovations (Tornatzky & Fleischer, 1990). Information systems researchers have used the TOE model to analyse EDI, open systems and e-business adoption.

The TOE framework has been used by Gibbs & Kraemer (2004), Zhu (2004) and Standing, Guillfoyle, Lin & Love (2006) as a theoretical foundation for studying organisational adoption. To examine the impact on e-business use and business, Zhu & Kraemer (2005) used the TOE framework. Based on Tornatzky & Fleischer's framework, Hu, Clark & Ma (2003) developed a research model, to measure the factors that influence TOE on e-business value. In addition, Zhu *et al.,* (2003) studied data from 3,100 firms so as to better understand the "influences of technology competence, organisational factors of firm scope and size, environmental factors of consumer readiness, trading partner readiness and competitive pressure on e-business adoption. All these studies were interested in understanding the antecedents to e-business adoption" (Zhu *et al.,* 2003: 254).

The three factors (i.e. technological, organisational and environmental) are interrelated within the hotel industry. Similarly, environments such as EDI and open systems, which have been analysed using the TOE model, find interdependencies among technological, organisational and environmental factors.

2.6.1 Technological Factors

Tornatzky & Fleischer (1990) describe 'technological context' as a collection of technologies accessible for innovation adoption by an organisation. Many studies

investigating innovation adoption have investigated the relevant technological factors. The concentration of these researchers has been on how technological factors can influence the decision of a hotel to either adopt or ignore IT. Tornatzky & Klein (1982) studied thirty distinguished innovation attributes and Rogers (1990) identified five technological characteristics. Amongst the five that Rogers (1990) identified, three were the same as those studied by Tornatzky & Klein (1982). These three characteristics were relative advantage, compatibility and complexity. Tornatzky & Klein concluded that these three characteristics are the ones that influence an organisation's decision to use or ignore innovation. The present study thus investigates these three characteristics. Each of the three characteristics is discussed in the following section.

I. Relative advantage

Rogers (2003:229) defines the "relative advantage" of an innovation as "the degree to which the innovation is perceived as being better than the idea it supersedes". Organisations must recognise that the adoption of innovation will either offer solutions to existing problems or present new production opportunities, such as increased productivity and improved operational efficiency (Zhu & Kraemer, 2005). A realistic adoption decision requires that one assesses the potential benefits of the new technology to the business. Organisations adopt a technology when they see a need for that technology, believing it will either take advantage of a business opportunity or close a suspected performance gap. If the technology offers many benefits to their adopters, such as timely information, reduced turnaround time, reduced costs and better customer service, then this will help the firm make the decision to adopt. Brown & Kaewkitipong (2009) and Lin & Lin (2008) argue that web technology is most likely to be adopted when organisations perceive that it will help with the sharing of business information within an establishment. In a competitive marketplace, the benefits of web technology offer significant motivation for businesses to adopt the technologies.

Lin *et al.*, (2007) and Fitzgerald *et al.*, (2005) in their studies state that relative advantages increase EC adoption by organisations. If managers do not perceive EC in a positive way and do not understand potential relative advantage involved in its adoption, they will hesitate to use it (Lin *et al.*, 2007).

II. Compatibility

Compatibility is defined as “the degree to which a technological innovation is perceived as being consistent with existing operating practices, beliefs, values, past experiences and needs” (Rogers, 2003: 240). Potential users of IT tend to be less concerned with a system being compatible with their values than they are with whether or not it is compatible with their previously introduced ideas. If the technological ideas that were previously introduced were not accepted, then the new ideas will be judged on the performance of the previous ideas. Previously introduced ideas may hinder or help the adoption of a new technology. Compatibility practices can have a positive role in deciding whether a new idea will be introduced (Lertwongsatien & Wongpinunwatana, 2003; Tornatzky & Klein, 1982). Organisations are expected to adopt an innovation if they perceive that it is consistent with their beliefs, culture and values, and when there is little or no resistance to change from the staff (Brown & Kaewkitipong, 2009).

Attributes of compatibility can impact on the decision to use new technology because technology often requires establishments to change their existing business practices and operations in order to increase the benefits of using the technology. Rogers (1995) states that compatibility, regarding technological innovation and organisational strategy, is encouraging, as it allows innovation to be explained within an accepted perspective. Brown & Kaewkitipong (2009) state that there is a positive relationship between organisational compatibility and website adoption. Al-Qirim (2005) and Lin (2008) also confirm that compatibility is an essential determinant of adoption. There can be significant changes to the work practices of a business as a result of that business using computers and other technologies, with the result that the refusal to accept change is common in organisations. It is therefore essential that changes are compatible with the business’s principles, beliefs and structures so that any technologies that are adopted by the managers who make the actual decision to adopt the technology will also be accepted by the owner and employees.

When a firm’s employees perceive EC to be compatible with their existing values and business procedures, that firm is more likely to be predisposed to supporting the successful diffusion of EC. EC can require the re-engineering of the entire value chain, in that it necessitates making the change from numerous manual, paper-based work methods to an

electronic system. Other studies have also confirmed that there is a clear association between adoption and compatibility (Lin, 2008; Macgregor & Vrazlaic, 2004; Lin & Lin, 2008).

However, Lin & Lin (2008) found the compatibility factor to be insignificant in IT adoption. This could have been because the firms that were sampled may have made organisational changes, reducing the influence of organisational compatibility in presenting different stages of e-business diffusion. This could have occurred because the firms that were sampled were current e-business adopters, and therefore the organisational environment in which their e-business diffusion was embedded was likely to have a low variance. Bagchi & Mahmood (2004) concluded that one of the major problems in the adoption of IT is the incompatibility of new technologies with present standards and business procedures. As was mentioned earlier, previously introduced ideas may help or hinder the adoption of an innovation, as previously introduced ideas serve as the basis on which new ideas are judged. A previously adopted innovation may prevent the adoption of a subsequent innovation, a phenomenon that Rogers (2003) terms "innovation negativism". A potential adopter, who has had an unsatisfactory experience, may choose not to adopt an innovation because of that negative experience.

Rogers (2003) also argues that the degree to which an innovation meets a felt need impacts upon its diffusion rate. The greater the innovation's compatibility with the felt needs of its potential adopters, the greater its diffusion rate. There will be a greater diffusion rate if the innovation's compatibility meets the felt needs of its adopters. Zhu *et al.*, (2006) found compatibility to be a valuable predictor of whether or not a new system will be adopted. However, Lee & Kim (2007) see compatibility as a key determinant of implementation as long as proper infrastructure is put in place, because companies do not want compatibility issues to become a problem when they implement IT.

III. Complexity

Complexity is defined as "the degree to which an innovation is perceived to be relatively difficult to comprehend and use" (Elbeltagi, 2007: 197). Rogers (2003: 257) defines complexity as "the degree of difficulty associated with understanding and learning to use innovation". If a technology is complex, there will be doubt about its successful

implementation and this will increase the chance that the hotel decides not to implement it. Zhu & Kraemer (2005) state that, if the technology being introduced is relatively complex, the probability of it being adopted is very low. Brown & Kaewkitipong (2009) point out that if the introduction of a new technology requires organisational employees to change their existing business procedures or acquire new skills, it may well prove intimidating to them. Complexity will consequently be negatively associated with IT adoption, and any subsequent technology that emerges will not be easily accepted because of the previous experience with technology (Lin & Lin, 2008). "The proliferation of standards and protocols and multiplicity of hardware and software make implementation of communication technologies a very complex task", according Brown & Kaewkitipong (2009: 223). Murphy *et al.*, (2006) also claim that complexity is a significant factor for managers adopting EC.

Studies show that an organisation is less likely to accept a new technology if it expects that a high level of new expertise must be acquired by its employees (Brown & Kaewkitipong, 2009). Murrillo (2004) concludes that the adoption of IT equipment is highly related to its perceived complexity. On the other hand, Grandon & Pearson (2004) write that complexity is an insignificant variable in the adoption of new technology. If employees find that it is difficult to use the technology they will not use the technology whatever benefits it may have. The adoption of IT is highly related to its complexity. Very few organizations will want to spend time training the employees on the level of expertise because that is time wasted for them. Businesses would rather have people applying to them with the skill that is needed than them spend money on training the employees.

2.6.2 Organisational Factors

Organisational factors are usually used to study the influences on the decision to adopt innovation. Seyal & Rahmna (2003) examined the relationship between organisational factors and the adoption of innovation. In an establishment, managers are the ones who make the critical decisions and this study thus investigates the characteristics of managers (i.e. their attitude towards and knowledge of IT) and an organisation's size as being determinants of EC adoption.

I Organisational size

Organisational size is another important factor that influences EC adoption. Zhu & Kraemer (2005) point out that the size of an organisation has a significant influence on the adoption of innovations. Doloreux & Melancon (2008) write that firms that have twenty or less employees have historically had innovation problems such as not having staff who are innovative, whilst larger firms have to consider the depletion of their resources, fluctuations in demand and international competition from other countries. Jensen & Webster (2006) argue that the chances of small firms doing well are slim and that it is more likely for large firms to be inventive as they can afford to access human capital skills and a wider collection of knowledge, and still have greater resources to invest. Burke (2005) claims that larger firms can enjoy economies of scale because they are more knowledgeable about business prospects and suppliers. Notwithstanding, Kartwi & MacGregor (2007) have also stated that larger firms might build bureaucratic barriers that make it more complicated to legitimise a new technology within a business, and this may well hinder the adoption of a technological innovation. Many researchers, however, have found that the use of IT has been positively associated with organisational size; in other words, the larger the firm the more likely it is to adopt a new innovation (Jensen & Webster, 2006; Levenburg, 2005). Based on data collected from 3,103 firms, Zhu *et al.*, (2003) found that large firms are more likely to invest in EC because they are more knowledgeable about business prospects and also have the necessary resources.

Some researchers, however, see a limited relationship between these two variables. For example, Jensen & Webster (2006) and Levenburg (2005) state that the size of the organisation is not connected to its use of IT. A nationwide survey of manufacturing firms was conducted and Levenburg (2005) did not support the proposition that size has an effect on a firm's adoption of Internet connectivity. He stated the following two reasons for this: most of the time small firms are not integrated into a system of firms that use familiar external resources; when small firms do well in implementing an IT project they are not usually recognised by large firms. Burke (2005) established that small firms seem to perform well in their specific areas. Burke stated that it is the type of resource that is accessible to the firm that is the important factor, not the amount of the resource that is accessible.

I Technology knowledge

Technology knowledge can be defined as a firm's level of specialised IT expertise in EC (Chandra & Calderon, 2009). Technology knowledge is a central element in the innovation process. Lin & Lin (2008) point out that appropriate training for end-users is critical if one is to successfully implement IT and promote the productive use of IT. Lertwongsatien & Wongpinunwatana (2003) claim that the importance of an IT user's level of education and on the different training that is necessary for different types of users. It is often stated in the literature concerning IT adoption, that potential adopters with a higher level of education tend to be more innovative, and, if companies have qualified workers, it will increase their readiness for the adoption of an innovation. Highly skilled workers can make IT investment and adoption easier (Fabian, Schivardi & Trento, 2005; Falk, 2005; Perez *et al*., 2005; Morgan, Colebourne & Thomas, 2006; Arvanitis, 2009). It is clear that computer training is an important criterion for the successful use of IT in organisations (Lin & Lee, 2005). Organisations are using more advanced technologies that require workers who are highly knowledgeable in technology (Liao & Hu, 2007). The benefit of IT can be improved through training, problem solving and computer skills (Arvanitis, 2009) because, once trained, employees' with higher educational levels will encourage and improve IT usage within a firm.

Lucchetti & Sterlacchini (2004) state that knowledge-intensive firms use a number of different information sources in their innovation processes, which they do through collaborating relatively more often with research partners and universities. Furthermore, Morgan *et al.*, (2006) acknowledge that firms with knowledge intensity do not lag behind in technology.

Technology knowledge is a significant variable in the adoption of the latest technologies and has been found to be positively related to the adoption of new technology (Yang, Yang & Wu, 2005; Yang & Fu, 2009). Even if firms do not have IT knowledge, it is important for them to be aware of the latest technologies so that they can adopt any new technologies that are needful. The technology knowledge of a firm is key to its IT planning success (Xanthidis & Nicholas, 2004; Kshetri, 2007). Therefore, to achieve planning alignment and pursue its planning capabilities, firms with adequate technological capability have better incentives than firms that lack technological experience. There are only a few

studies that show a weak relationship (Maliranta & Rouvinen, 2004) or none at all (Liao & Hu, 2007) is found to exist between adoption and IT educational level.

Lertwongsatien & Wongpinunwatana (2003) state that general managers with high education levels have more positive attitudes towards IT and managers with low education levels have negative attitudes towards IT. This is significant because, if the manager of a hotel has a positive attitude towards IT, the employees of that hotel are more likely to have technology knowledge as well (Lin & Lee, 2005) and a hotel that has the required expertise in IT is more likely to improve its EC applications.

Grandon & Pearson (2004) suggest that managers are reluctant to adopt new technologies because of their low level of IT knowledge and their fear that the new technologies might disturb their ability to provide specialised services to guests. According to Hipkin & Bennet (2003), the technology knowledge of hotel managers in South Africa is generally limited because most of them do not receive any training in IT and thus are doubtful about investing in IT. Lin & Lee (2005) write that, in addition to this, the large scale of IT hotel operations and the low technical ability of hotel managers will continue to be at a high risk of experiencing IT problems if managers are not trained. In a study conducted by Law and Jogaratnam (2005) in Hong Kong, it was found that 45% of the hotel managers who were interviewed held university degrees, and 52% of the respondents had formal education in computer science. On the other hand, Lin & Lee (2005) state the decision-makers in the hotel industry do not seem to be aware of the significance of IT to business strategies.

II Attitudes towards EC

The hotel organisational policy concerning the acceptance of new technologies is subject to a manager's perception of the direction and speed of changes in the market, irrespective of how accurate these observations may be. The function played by managers has been seen as being the most significant contributing factor to the behaviour of establishments in terms of their adopting or ignoring new technologies. Grandon & Pearson (2004) and Orfila-Sintes & Mattsson (2009) state that, when managers consider technologies to be of strategic significance, a realistic approach is taken to analyse these technologies for non-strategic purposes. Because of the interest of the manager, it is easier to obtain the necessary capital, human resources and other related internal resources that are necessary

to adopt the technology (Zhu & Kraemer, 2005; Orfila-Sintes & Mattsson, 2009). However, if managers do not foresee any benefits to technology, IT will only play a marginal role in that hotel.

Previous studies (Grandon & Pearson, 2004; Lin & Lee, 2005; Orfila-Sintes & Mattsson, 2009) clearly show that there is a significant association between support for IT by management and the acceptance of technology within a hotel. The following studies do not only show the association between support from management and technology, they also show that a manager's attitude is important if adequate resources are to be acquired for adopting new technologies: Rogers (1995), Grandon & Pearson (2004) and Orfila-Sintes & Mattsson (2009). Burke (2005) state that those businesses whose managers perceive IT to be important, compatible and easy to use are relatively more likely to adopt IT. Managers can positively or negatively influence the adoption of technology in an establishment; therefore, appropriate training encourages the acceptance of technology. It is therefore important to train hotel managers (i.e. provide them with the necessary information about IT) so as to help them overcome their reluctance to adopt new technologies. As Gibbs & Kraemer (2004) and Lin & Lee (2005) also write that, the attitude of a general manager can be influenced by the level of education and training.

2.6.3 Environmental Factors

Innovation is necessary for any establishment that exists in a changing environment. Previous studies have found that information intensity and competition encourage innovation adoption (Pitt *et al*., 2008; Naranjo-Gil, 2009). Businesses cannot control the environmental factors and these factors initiate the need for businesses to adopt IT innovations (Naranjo-Gil, 2009). This study therefore examines two of the environmental factors (namely competition and information intensity). Zhu & Kraemer (2005) state that there is low rate of IT adoption with firms working in a setting in which government policies are restrictive. The different ways in which government regulations can affect innovation are: (1) they can increase or decrease payoffs, for example the collection of tax, and (2) they can alter the way innovations are received. Companies usually complain about the lack of legal protection for online business activities.

In this study, the investigation into environmental pressure focuses on external demands from customers and suppliers. According to Stanko *et al.,* (2007), customer pressure is influential and a lack of supplier use is an inhibitor in terms of EC adoption. Standing *et al.,* (2007) highlight the importance of organisational managers communicating effectively and maintaining good relationships with suppliers in an e-marketplace. Stockdale & Standing (2004) further highlight that the e-competence of the industry sector is a significant barrier to EC adoption and innovation.

I. Information intensity

Information intensity "refers to the degree of information that is present in the product or service of an organization" (Whittaker & Bellotti, 2006: 68). Businesses can improve their products with high information by means of information technology (Kim, Lee & Law, 2008). The "information content of a product is the useful information within a product that is received and understood by the user of that product" (Whittaker & Bellotti, 2006: 69). Similarly, "the information of a product's value chain is said to be the information processing that is needed for processing the product in its final form" (Whittaker & Bellotti, 2006: 70). Whittaker and Belloti state that, when there is enough information about a product, it is likely that the product will be adopted. Therefore, higher information intensity results in an establishment perceiving innovation as being a competitive tool and this encourages the level of innovation that is adopted. Kshetri (2007) and Chandra & Caldeneron (2009) suggest that, for a complex product to be adopted, an establishment has to have sufficient information in order to have an understanding of the benefits of that product. Teo, Ranganathan & Dhaliwal (2006) state that information intensity is important to the extent of IS adoption. On the other hand, Al-Qirim (2005) argued that information intensity of products is insignificant when it comes to adoption. Consistent with most literature, Chandra & Caldeneron (2009) used information intensity to indicate the content and extent of IT usage in a firm's products and value chain. Firms that have low technology content in their products are expected to have low information intensity. But firms that have high technology content will also have high information intensity. Information intensity therefore depends on the level of IT used by a firm. It is only when there is enough information that a product can be easily accepted.

II. Competition

Competition can be defined as "the degree that the company is affected by competitors in the market" (Zhu, 2004: 168). The following two studies have examined the impact of competitive pressure on the application of Internet-based systems aimed at gaining a competitive advantage: Ranganathan, Dhaliwal & Teo, (2004) and Wang & Cheung (2004). Other researchers have seen competitive pressure as being a significant determinant of a firm's level of computerisation (Zhu & Kraemer, 2005; Lin & Lin, 2008; Naranjo, 2009), its adoption and utilisation of inter-organisational systems (Zhu *et al*., 2006). The competitiveness of an industry and the method by which a firm competes has a considerable effect on the firm's IT performance (Fraser & Wresch, 2005).

The hotels that were the first to set up EC have gained relatively greater benefits (Kim *et al.*, 2008). Hotels assess their external business opportunities and risks by evaluating the degree to which they have managed to accomplish certain strategic IT development objectives (Chi, Jones, Lederer & Li, 2005). Studies on communications technology, especially EC, have shown that, in order to compete in the marketplace, a firm has to utilise technology (Gazzoli *et al.*, 2008). The intensity of the competition amongst hotels within the same location can affect the decision of those hotels to either adopt or ignore new technologies. Zhu & Kramer (2005) argue that competition is likely to drive firms to initiate and adopt EC in order to gain or maintain a competitive edge. Porter (2008) has contended that firms that adopt EC may alter the rules of the competition, affect the industry's structure and come up with new ways of outperforming rivals. The present study will investigate this issue in the context of South Africa.

2.6.4 Extent of Electronic Commerce Adoption

There have been many studies that have focused on the likelihood of innovation adoption rather than on the extent of innovation adoption. As a result of the rapid development of technology, most of the hotels registered with the Tourism Council of South Africa now have Internet access. Therefore, a more important research objective would be to investigate the extent of adoption of EC rather than examine the likelihood of EC adoption by hotels. Most of the hotels in South Africa utilise technologies to enhance their

competitive edge. Therefore, understanding the degree of EC adoption by hotels in South Africa is important for this study.

It is important to analyse the business activities and operation processes of hotels in order to conceptualise the extent of their EC adoption. Their business activities can be divided into the following five categories, according to Porter's (2008) value chain theory: inbound logistics, operations, outbound logistics, marketing and sales, and service.

Many researchers have suggested a number of frameworks of EC activities. Based on their business purposes, EC activities have been categorised into three groups (Ho, 1997). The three groups are:

1. Use EC to market products and services, which is done through production of products and services
2. Communicate through EC, which is defined as the provision of data and information
3. Use EC to transact

Other than Hollenstein (2004), who also categorised the various EC activities, Nambisan & Wang (2000) suggest the following, similar classification of EC activities:

1. Disseminate information about products and services through EC, which is defined as information access
2. Facilitate real-time work through EC, which is defined as work collaboration
3. Integrate EC into core business processes and transactions

A study conducted by Soh, Mah, Gan, Chew & Reid (1997) reveal that companies use EC to perform the following functions: customer service support, electronic transactions, marketing and advertising, and information gathering.

Based on Porter's (2001) value chain theory, Wu *et al.,* (2003) suggest an EC framework that categorises EC into the following activities: communicating, order taking, internal administrating and procuring. They further state that these four processes provide a set of processes that occur between the internal and external areas of an organisation. These processes do not completely represent the extent of adoption of EC domains. The present

study has modified the model of Wu *et al.,* (2003) and has focused on the supplier-and-customer interface.

Partner relationships and mutual willingness are important determinants of inter-organisational systems adoption (Lin, 2008). A supplier or customer might pursue IT strategies in order to encourage his business partners to use EC, because the advantages of EC can only be maximised when several business partners make use of e-business (Lin & Lin, 2008; Andreu, Aldas, Bigne & Matitila, 2009). When the trading partners of a firm have greater expertise in EC, that firm is presented with an external incentive for using e-business (Brown & Kaewkitipong, 2009). Thus, the increased readiness of trading partners will lead to better internal integration, as well as better external diffusion of e-business. Hence, a number of firms adopt EC as a result of the demand from suppliers to increase the efficiency of their inter-organisational business. Lin & Lee (2005) state that the benefits of communication technologies are realised only when there is a considerable number of adopters, as well as when a group of firms expect their trading partners to be connected electronically with them so as to help them all realise the benefits of technology. It has therefore become a strategic requirement for firms to have these technologies (Lin & Lee, 2005). Firms also set up electronic contacts with their suppliers to reduce their operating expenses and thereby become more competitive within the marketplace.

2.7 Conclusion

In the first part of this chapter, the focus was on EC and a greater part of the discussion was on EC adoption within South Africa. Innovation is one of the areas that is discussed, as to what innovation is, why it is important when discussing EC and how it can contribute to an organization, positively or negatively.

The chapter pointed out how technology has affected the hospitality industry. The impact of IT and its importance in the hospitality industry has resulted in the improvement of consumer services and business cooperation. The chapter further pointed out the status of EC in South Africa, as to how it has developed, at what level it is and what other researchers say about it.

Hotels in general were then discussed and it emerged that hotels were reluctant in adopting technology. Finally, each of the determinants (relative advantage, complexity, compatibility, organisational size, technology knowledge, the manager's attitude, information intensity and competition) of EC adoption were discussed and the related extent of EC adoption. The next chapter will present the design model of the study.

3 CHAPTER: DESIGN MODEL

3.1 Introduction

The purpose of this research is to examine the associations between those factors that are of importance when deciding whether or not to accept and use electronic commerce within the hotel industry. Through the literature review that has been provided, the researcher identified several factors that can influence hotels in the adoption of electronic commerce. This chapter discusses the TOE model in detail.

Innovation is a concept that has been extensively studied at the individual-level with less emphasis on understanding organisational-level effect. Organisations support innovation when the existing process is replaced with one that is an improvement over the current system (Rogers, 1995). Organisations may seek innovations due to industry pressure. A number of studies have investigated the organisational adoption of IT by developing empirical research models and theories to test individual-level acceptance of technologies (Davis, 1989).

There are many theories used in IS research (Baggozi, 2007). The most used theories in technology acceptance are the Technology Acceptance Model (TAM), Theory of Planned Behaviour (TPB), Unified Theory of Acceptance and Use of Technology (UTAUT), Diffusion of Innovation Theory (DIT) and the Technology Organisational and Environmental Theory (TOE). The theories that are discussed in this study are DIT and TOE because they are the only ones that are at firm level, the others are at individual level.

One of the commonly employed models is the Technology Acceptance Model (TAM), which explains and predicts an individual's acceptance behavior toward a new technology. TAM is one of the theories that could have been used in this study to evaluate individual organisation-level of acceptance of technologies. TAM was developed by Davis (1989) to describe the acceptance behaviour of an organisation toward a new technology. TAM is useful in terms of understanding why businesses accept certain technologies. However, the reason TAM is not suited for this study is that the adoption decision for EC is generally a strategic firm-level initiative that needs to use an organisational-level theory and show an

establishment's acceptance with regard to EC. Therefore, there is a need to employ an organisational-level theory to explain and predict an organisation's acceptance behavior.

Another theory that is useful in understanding technology acceptance is the Unified Theory of Acceptance and Use of Technology (UTAUT). The theory is useful in understanding why individuals accept particular technologies (Venkatesh *et al.*, 2003). The UTAUT was based on eight models that earlier research had constructed regarding IS usage behavior. The theory considers four constructs (performance expectancy, effort expectancy, social influence and facilitating conditions) that are direct determinants of usage intention and behavior. The four constructs discuss the individual level of acceptance, not the organizational-level (Venkatesh *et al.*, 2003). In the case of an organisation, the organisation has to be ready and that depends on the financial readiness and technological readiness of the organisation, not of the individual. The organisational processes will determine the organisational readiness to adopt the innovation and transform, not an individual's readiness. Information technology infrastructure competence and EC know-how will also determine readiness and such readiness will affect the industry environment. Therefore, a model that will be suited for investigating organisational-level acceptance of technologies should be used.

A theory that is similar to TOE is Rogers' (2003) Diffusion of Innovation Theory (DIT). DIT is a theory that explains why, how and the extent to which new ideas and technology spread. Rogers mentions that DIT is mainly based upon (1) the features of the technology and (2) the assessment of the user of the system. DIT assumes that the decision to adopt is taken to enhance operational efficiency (Teo & Ranganathan, 2004). However, the environment will have an influence on the company's decision to adopt technology; for example, government regulations have an impact on technology, competitors, suppliers and customers. The poor decision to adopt EC by some businesses is possibly a result of the environment as well as the features of the technology being considered. These all play major roles in terms of an establishment's adoption decision. The framework that is appropriate for this study is one that will consider the influence of TOE on factors that influence the level of EC adoption and scope within a company. The TOE framework by Tornatzky & Fleischer (1990) allows for investigation of specialised factors that can influence EC adoption.

3.2 Tornatzky and Fleischer's Technology Organisational and Environmental (TOE) Model

The TOE model is important for studying contextual factors within the present study (Tornatzky & Fleischer, 2003). This model suggests that the following three aspects influence a firm's decision as to whether or not to adopt a new technology: (1) technological context, which includes relative advantage, complexity and compatibility, and which includes technologies adopted by organisations, (2) organisational context, which describes the uniqueness of the firm, the involvement of a firm, its managerial attitude, the quality of its human resources and the firm's size, and (3) environmental context, which describes the firm's industry, its information intensity and its business with competitors, suppliers and customers (Tornatzky & Fleischer, 1990).

Tornatzky & Fleischer's model emphasises that technological, organisational and environmental issues affect the procedures by which a business chooses to adopt a new technology. Technological context considers existing technologies and new technologies that will improve organisational productivity. The organisational context considers the complexity of the managerial structure, centralisation, quality, availability of human resources and formalisation. The environmental context considers the place and location where the establishment conducts its business and is also affected by the firm's competitors, interactions with the government, the industry itself and access to resources.

The TOE model has been used in several studies, e.g. Iacovou & Benbasat (1995) developed a model formulating three aspects of Electronic Data Interchange (EDI) adoption. The three aspects were technological, organisational and environmental factors (TOE) as the main drivers for EDI adoption, and the researchers examined the model using seven case studies. Their model was further tested by other researchers using larger samples, for example Kuan & Chau (2001). Zhu *et al.*, (2003) drew on the TOE model to identify facilitating and inhibiting factors in terms of the decision by European firms with regard to e-business adoption. Zhu (2004) focused on the financial service sector and how TOE factors may influence the impact of e-business on a firm's performance. Zhu & Kraemer (2005) examined the role of the TOE factors in terms of influencing e-business usage in the retail industry. Bayo-Moriones & Lera-Lopez (2007) as well as Lin & Lin (2008) focused on the factors affecting the acceptance of e-commerce and the value chain.

These studies demonstrate the importance of the TOE for identifying benefits and disadvantages of the adoption of e-business. Because the TOE model has a theoretical basis and consistent support from the studies mentioned above, it is used as a theoretical background

The theoretical framework, which is based on Tornatzky & Fleischer's (1990), is illustrated in Figure 3.1. Figure 3.1 also presents a summary of relevant prior studies. Eight determinants of innovation adoption – which exist within the three contexts – have been identified in this study to (1) assess the relationship between each context and the extent of adoption of EC and (2) determine which contexts influence the adoption decision of EC. Each of the determinants is discussed in Chapter 2.

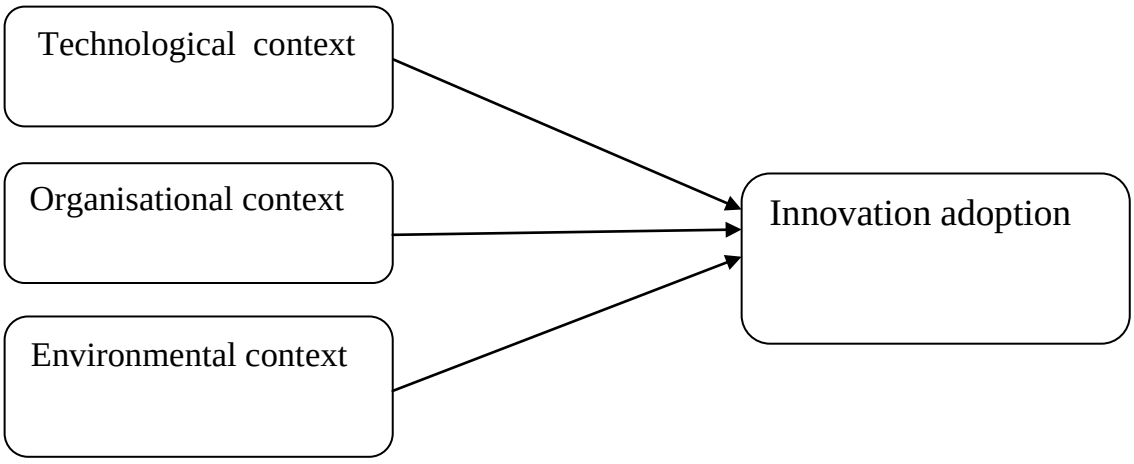

Figure 3.1: The TOE model by Tornatzky and Fleischer 1990

As a generic theory of technology, the TOE framework can be used for studying any kind of information systems innovation (Lera-Lopez, 2007), which includes e-banking (Riyad *et al.*, 2009). The TOE framework has been used extensively in various empirical works on information systems adoption, as can be seen in Figure 3.1.

The TOE framework developed by Tornatzky & Fleischer is comprehensive enough for identifying factors shaping innovation adoption, and serves as a conceptual guideline for this research. After a review of its theoretical roots and empirical evidence, Oliveira & Martins (2010) state that the TOE framework has consistent empirical support, although specific elements showed that within the three contexts may differ with different studies.

3.2.1 Technological Context

Many studies that have researched innovation adoption have investigated this factor (Tornatzky & Klein, 1982). The focus of Tornatzky & Fleischer's 1990 study is on how adoption decision can be affected by technology. Thirty perceived innovation characteristics have been studied by Tornatzky & Klein (1982) and, among these, five were the ones that Rogers (1995) discussed in his DIT. Rogers identified the following five characteristics of diffusion of innovation theory: relative advantage, complexity, compatibility, triability and observability. When Tornatzky & Klein (1982) conducted their study on the thirty perceived innovation characteristics, they found that relative advantage, complexity and compatibility had more influence in terms of the decision to adopt an innovation or not compared to the other characteristics. Rogers' (1995) diffusion of innovation theory is one of the most cited studies of technological characteristics. Rogers mentions that the adoption decision is affected by individual perception. In the hotel industry, managers are the key decision-makers. Their perception of innovation adoption is important (Lin, 2008). The present study discusses the determinants of adoption of EC in the hotel industry. It is because of Tornatzky & Fleischer's (2003) findings, which considered the common characteristics of Rogers (1995) and Tornatzky & Klein (1982), that this study used relative advantage, complexity and compatibility as technological factors of adoption of EC.

3.2.2 Organisational Context

Tornatzky & Fleischer (2003) suggest that organisational processes would either restrict or assist in the adoption of innovation. Many studies have looked at factors such as formalisation and organisational size as determinants of adoption in the organisational structure.

The factors that are usually employed to examine the influence of a business on the decision to adopt innovations are organisational factors. Seyal & Rahman (2003) used organisational size to examine the businesses relationship to adoption of innovation in organisational structure. The role of top managers was also seen as the main determining factor that influences innovation adoption in organisational processes. Managers are the ones who make a company's critical decisions (Lin & Lee, 2005; Akbaba, 2006) and,

hence, this study looked at the managers' characteristics (attitude and IT knowledge) and at organisational size as being the determinants of adoption of EC.

3.2.3 Environmental Context

Whitla *et al.,* (2007) indicate observed that when an establishment faces a complex and rapidly changing environment, innovation is necessary. The following studies observe that competition and information technology stimulate innovation adoption (Kshetri, 2007; Chi *et al*., 2005). It is therefore important to find out if that is the case in EC adoption in the hotel industry; hence, this study has adopted information intensity and competition as environmental factors for adoption of EC.

The TOE framework, which is the framework that is used in this study, is illustrated in Figure 3.1. The present study identified eight determinants of innovation adoption. The determinants were used to look at the relationships between each context and the extent of adoption of EC, and to establish if each context has an effect on the adoption of EC. Each of the determinants is discussed in Chapter 2.

3.3 Diffusion of Innovation Theory

The DIT is included as one of the theories to be used because the variables used in DIT are the same variables that are used in Tornatzky & Fleischer's technological context. When discussing the technological context in a study, one is basically using the DIT.

In general, innovation is defined as the acceptance of an idea or behaviour that is new (Rogers, 1995). The innovation can be a new technology, a new service or a new product. The ease with which a new product is adopted can affect the likelihood of that product being accepted. An innovation that is simple to use will reduce the effort and time that needs to be spent on learning about the new product and how to use it. A questionnaire was developed by Soh *et al.,* (1997) to examine the individual perceptions of innovation. It incorporated 22 items, of which five attributes were the ones Rogers had discussed in his theory.

Tornatzky & Klein (1982) also conducted a similar study about information systems; they examined the association between innovation features and acceptance and identified ten characteristics of innovation, which include relative advantage, compatibility and complexity. These characteristics were found to be associated with the adoption of various information technologies (Xu *et al*., 2004; Goldstruck, 2007).

In a review of the literature for this study, the most accepted theory is Rogers' (1995) innovation theory, which identifies characteristics of innovation (Lin & Lee, 2005; Harkema, 2003). Rogers' theory has been seen by a number of researchers to positively affect the number of studies on IS acceptance (Zhu *et al*., 2003; Xu *et al*., 2004; Zhu & Kraemer, 2005; Bayo-Moriones & Lera-Lopez, 2007). Thus the importance of including Rogers's theory is that it discusses the same attributes as the ones identified by Tornatzky & Fleischer in the technology context, which are: relative advantage, compatibility and complexity.

3.4 The Research Design Model

The generalisation reported by Tornatzky & Fleischer (2003) serves as the underlying basis for the present study model. The Tornatzky & Fleischer model hypothesised that the rate of adoption is influenced by perceived attributes of technological innovation, organisational context and environmental context. Drawing upon the technology, organisation and environmental framework, a conceptual framework was developed, as shown in Figure 3.2, incorporating eight TOE factors affecting the determinants of EC adoption. The factors are: relative advantage, compatibility, complexity, organisational size, manager's attitude, manager's technology knowledge, information intensity and competition. The key elements of this framework have been discussed in chapter 2.

The study model and the determinants of EC adoption show the relationships between the perceived attributes of technological, organisational and environmental context.

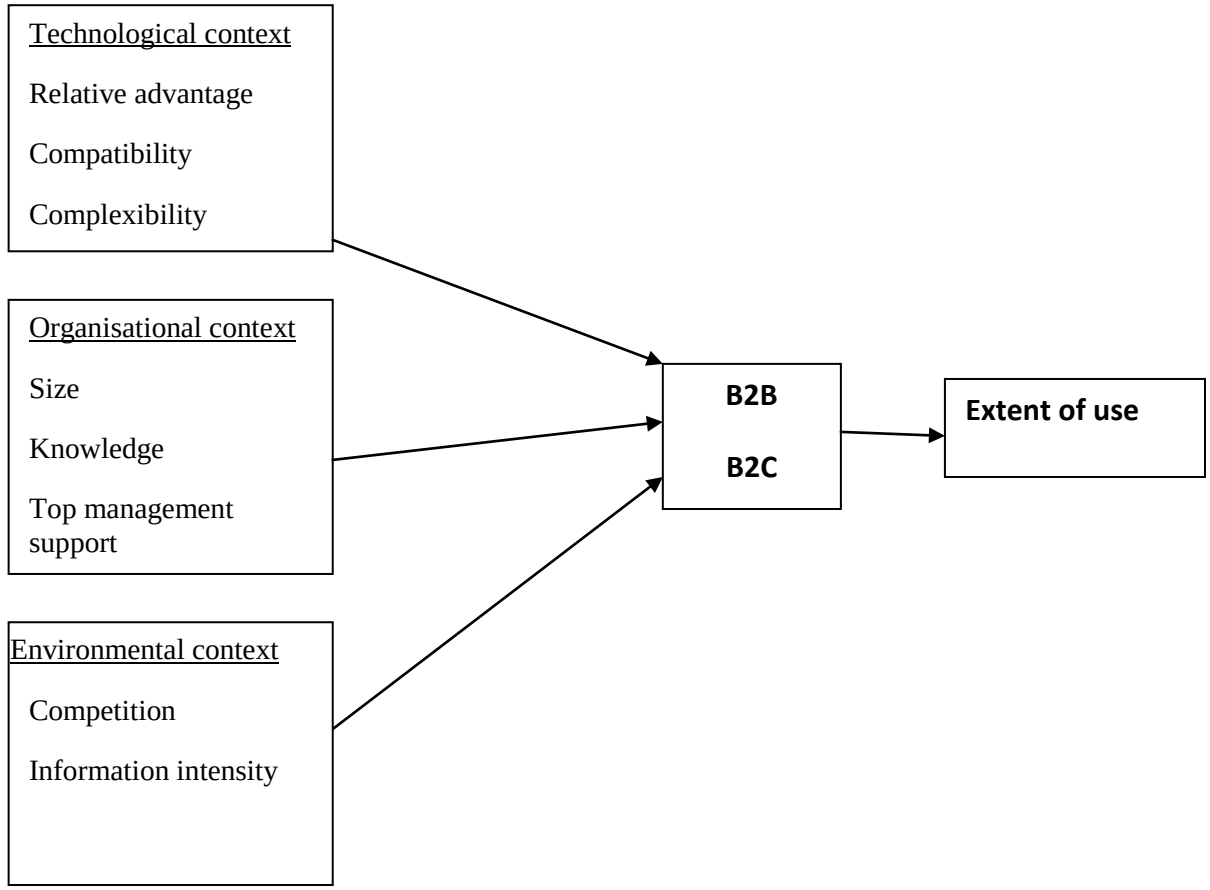

Figure 3.2: Proposed Research Model

The use of various technology acceptance models to determine the likelihood that someone will use e-commerce to make online purchases of goods and services seems logical. However, the user has to commit to a trade relationship with the website. Other factors also come into play. Traditional acceptance models do not provide sufficient explanation with regard to how or why customers use e-commerce technology.

Table 3.1 Research questions in relation to the model

Based on the proposed model the table below was designed to show which research questions relate to which construct and which elements of the questionnaire relate to which of the variables.

Independent Variables			
Research questions	Constructs	Number of items	Questions in the questionnaire
Research question 1	**Technological context**		**Section 1 of the questionnaire**
	Relative advantage	17	Questions 1,2,3,4 and 5
	Compatibility	4	Question 6
	Complexity	4	Question 7
Research question 2	**Organisational context**		**Section 2 of the questionnaire**
	Size	4	Questions 1,2,3 and 4
	Manager's IT knowledge	6	Question 5
	Manager's attitude	12	Question 6
Research question 3	**Environmental context**		**Section 3 of the questionnaire**
	Information intensity	4	Question 1
	Competition	6	Question 2
Dependent Variables			
Research question 4	**The extent of use**		**Section 4 of the questionnaire**
	B2C outbound Communication	5	Questions 4.1 to 4.5
	B2C order taking	4	Questions 4.6 to 4.9
	B2B inbound Communication	4	Questions 4.10 to 4.13
	B2B outbound Communication	4	Questions 4.14 to 4.17

3.5 Conclusion

The research model was developed in this chapter. This model will form the basis for the empirical evaluation of independent variables on the extent of use of EC in South Africa. The TOE model looks at what influences the firm to adopt an idea or technology. The model suggests that there are three contexts that influence a firm to adopt a technology and these are the technological context (relative advantage, complexity and compatibility),

the organisational context (managerial attitude, technological knowledge and firm's size) and the environmental context (information intensity and competition).

The technological context looks at existing and new technologies that will improve productivity of an organisation while organisational context looks at the structure of an organisation, quality and the characteristic of managers. Finally, the environment considers the industry and its location and the resources that are available. Each of the determinants was discussed in Chapter 2.

The researcher further discussed Rogers's (2003) Diffusion of Innovation Theory (DIT), which is similar to the TOE model but focuses on the technology context only. The TOE model allows for investigation of certain factors that can influence adoption of EC. Examples of different studies (1. How TOE factors may influence the impact of e-business on a firm's performance. 2. The role of the TOE factors in terms of influencing e-business usage in the retail industry. 3. Factors affecting the acceptance of e-commerce and the value chain) that have used the model have been mentioned. Drawing upon these studies, and the theoretical perspectives that were discussed and the literature review, it was argued that the TOE model is suitable for the study of the determinants of EC acceptance within the South African hotel industry. Finally, a table showing which research question relates to which construct and how the elements of the questionnaire relate to each construct was prepared.

The next chapter will present the research methodology which explains how the study was carried out.

4. CHAPTER: RESEARCH DESIGN AND METHODOLOGY

4.1 Introduction

This chapter focuses on the research methodology that has been used in this study. The following aspects are covered: research design, ethical considerations, method of data collection, population and sampling, research questions and instrumentation. The purpose of analysing the methodology is so that the credibility and validity of the information that is gathered can be ensured.

4.2 Research Design

The purpose of this study is to explore the experiences of the participants in relation to the introduction of new technology, specifically EC in the hotel industry, and to identify the unique conditions that may cause users to either accept or reject the new technology. Based on the literature review, it has been suggested that users' resistance to information technology could be the result of, for example, the ease of use of a new technology, its usefulness, the fear of the output (not sure what it will be) and bad experiences from previous attempts to use new technology (Grandon & Pearson, 2004).

A quantitative research design has been used for the present study. For the data collection process, a correlational and descriptive research survey has been used. Surveys allow for the collection of large amounts of data within a short period of time (Creswell *et al.*, 2008) and can provide a basis for generalising the results to the whole survey population (Remenyi & Money, 2004). Sekaran & Bougie (2010) point out that survey can be used for both descriptive and explanatory objectives. Correlation research explains the relationship that exists between variables and the extent to which these variables relate to one another.

According to Gay *et al.,* (2008), descriptive research is appropriate for studies where the aim is to establish the status of subjects, objectives or events. The descriptive design was chosen because it examines the present status and extent of adoption of EC within the South African hotel industry.

In the literature review, the researcher identified the factors that are perceived as being important with regard to EC adoption by hotels in South Africa. To answer the four research questions, the questionnaire was divided into the following four sections: (1) the technological context and the degree of EC acceptance, which includes relative advantage, compatibility and complexity, (2) the organisational context and the degree of EC acceptance, which includes organisational size, technology knowledge and the manager's attitude, (3) the environmental context and the degree of EC acceptance, which includes information intensity and competition and (4) the degree of adoption of EC, which includes EC acceptance of B2B inbound communication, EC acceptance of B2B outbound communication, EC acceptance of B2C inbound communication and EC acceptance of B2C order taking. The technological, organisational and environmental contexts constitute the independent variables and the extent of adoption of EC constitutes the dependent variable.

The research questions in this study lend themselves to a survey methodology. There are two main reasons for using a survey rather than any other research design. Firstly, the study's investigation of multiple variables requires that there be a sizeable sample in order to obtain valid and reliable research results. An email survey would have been a useful research tool for reaching a large number of subjects. Secondly, there are hotels scattered throughout South Africa, thus an email survey had the advantage of reaching widely dispersed respondents in a relatively inexpensive way (Leedy & Ormrod, 2005). However, the major limitation of this method is that surveys conducted by email traditionally achieve a low response rate (Sheehan, 2001).

The hotels were drawn from the databases of three major groups of hotels, as suggested by the South African Tourism office. These three groups are: (1) the Tourism Grading Council hotel listing (2) the Tshwane accommodation listing and (3) the AA travel accommodation listing.

4.3 Ethical Considerations

In order to conform to the ethical requirements of the University of KwaZulu-Natal, the researcher applied for ethical clearance before conducting the research. The purpose of the ethical clearance was to ensure that the research being conducted by the researcher through

the university would adhere to established research procedures. The hotels were informed in the covering letter of the questionnaire that their responses would be confidential and their answers would be kept anonymous (see Appendix 1).

4.4 Population

The population is the "universe of elements from which sample elements are drawn, or the universe of elements from which researchers want to generalise" (Creswell, 2008). In the present study, the target population was hotel managers in South Africa. The hotels used in this study had to belong to one of the three groups suggested by Tourism Council. They also had to be registered in South Africa. The managers of the hotels were selected because they make the final decisions on capital expenditure. In addition, the managers are able to provide the most appropriate responses because they work directly with the information technology professionals.

4.5 The Sampling Methods

Sampling techniques can be divided into two categories, namely non-probabilistic and probabilistic. The non-probability sampling method is based on the judgment of the researcher and may or may not be representative of the target population. The procedures for non-probabilistic sampling are methods such as purposive sampling, quota sampling, snowball and incidental sampling. Probabilistic sampling is a procedure that requires a known probability of being chosen for each participant in the sample. "The procedures for probabilistic sampling are: simple random sampling, systematic sampling, stratified random sampling, and cluster sampling" (Leedy & Ormrod, 2005: 209).

The systematic sampling method involves selecting individuals according to a predetermined sequence. The population must be a homogeneous group of individual units. Simple Random Sampling is chosen by simple random selection where every member of the population has an equal chance of being selected. If the population is small and the members are known simply random becomes easy to use. For the present study simple random selection was used where each hotel had to be assigned a number and then the random table was used to select the hotels to be used. Random sampling was done for each group so that each group would be represented.

Cluster sampling is used when groupings are evident in the population. In cluster sampling, the total population is divided into groups or clusters and the population consists of discrete clusters with similar characteristics, which is the case with the hotels in the three different groups. Cluster sampling could have been used in the present study but the researcher did not intend to compare the three groups. The main intention of the study was to obtain a substantial number of hotels and therefore the three listings (1. the Tourism Grading Council hotel listing 2. the Tshwane accommodation listing and 3. the AA travel accommodation) listing were used.

From the target population of 1500, a sample size was determined (n=400) using Leedy and Ormrod (2005). The names of the hotels in the target population were written on a piece of paper and were assigned a number. Simple random sampling was used to ensure representation in all the 3 groups. The numbers (with hotel names) were mixed in each sub group and the desired number of hotels was drawn in each group according to the sample size (Babbie & Mouton 2001).

The survey questionnaire was developed from the literature. The target population included all 3 groups from the Tourism Council. 400 questionnaires were e-mailed at the beginning of August 2009. There was no response by end of August; reminders were sent out at the beginning of September and only 26 questionnaires were returned. The remaining 374 questionnaires were self-administered and the researcher was able to get 306 questionnaires. The questionnaires were delivered to the hotels, some were filled and returned on the same day and others had to be collected later on. Data collection started in August and ended on the 19th of December 2009. From the sample of 400 hotels, only 332 were reached. Several reasons led to the failure to get 374. Some hotel managers said the timing was not good, especially those in the Mpumalanga province, which was surveyed in December. Another reason was that, because of costs, the researcher did not distribute the questionnaire in the North West and the Northern Cape provinces. Only 9 hotels were sampled in these two provinces.

4.5.1 The Sample Size

Creswell (2008) and Leedy & Ormrod (2005) suggest that for a population of about 1,500, a sample size of 300 would be acceptable. The researcher assigned a number to each

individual hotel from each of the three groups identified by the Tourism Council, so that each group would be represented. A table with random numbers was used to select 400 hotels to be included in this study. Finally, the researcher had to physically hand out the questionnaire to the managers in the hotels and ask them to complete it.

4.6 Pilot Study

As mentioned by Gay *et al.,* (2008), a pilot study is generally recommended because it can show the researcher potential weaknesses in the design and instrumentation of the planned study. Gay *et al.,* (2008) suggest that it is appropriate to use respondents from the actual target population and use the methods and protocols that have been chosen for one's data collection.

The researcher undertook a pilot study in order to increase the reliability, validity and usability of the survey. Firstly, the researcher administered the questionnaire to IT experts for content validation; this helped determine whether or not the instrument would provide adequate coverage of the problems set out in the study. Changes and clarification of, the various questions included in the survey were prepared before the pilot study was conducted. Secondly, the questionnaire was administered to two staff members from the university's School of Statistics to see if the questionnaire could be analysed. Finally, the questionnaire was administered to managers of hotels who were not sampled in Pietermaritzburg and Durban in order to pilot the questionnaire (see Appendix 2).

The pilot study was conducted through eight hotels, and this method of pre-testing the questionnaire provided the researcher with the assurance that the respondents would understand the meaning of each item. It also offered the researcher the opportunity to add any item(s) that were thought needful, or delete any item(s) that were deemed unnecessary. It further allowed the researcher to decide if there should be any change to the present order of items. It also helped to assess the length of time needed to answer the questionnaire. The results of the pilot test were satisfactory; the respondents had no difficulty understanding and answering the questionnaire and therefore no changes were made to the original questionnaire.

4.7 Methods of Data Collection

Primary data is data that is derived from questions or observations specifically related to the research problems and objectives (Leedy & Ormrod, 2005). One of the advantages of primary data is that it is current and can give a more realistic view to the researcher about the topic under consideration. Another advantage of primary data is that it can be collected from a number of ways like focus groups, telephone surveys, interviews and other methods of collecting data. However, there are some disadvantages of primary data collection; for example, respondents do not give timely responses. At times, the respondents may give fake answers and try to cover up the realities. In other cases, there is no control over the data collection. At times, there will be incomplete questionnaires, which will have a negative impact on research. Secondary data could have saved time in data collection, but there was no data that could be found for this study that would have addressed all the research questions.

During August and part of September of 2009, only twenty-six answered questionnaires were received by email and the remaining 306 were collected by the researcher when she visited the different provinces. The data collection procedure took five months from the time when the first set of questionnaires was emailed. The survey was supposed to be done via the Internet; the respondents were sent the questionnaire and were asked to email the completed questionnaire back to the researcher. The researcher had to make further communication with the hotels via email because nothing was received from the first batch that was sent out, and from the second batch only twenty-six were returned. Data collection through the Internet would have been easier, but Internet-based sample collection is often criticised for (1) reliability (2) respondents' bias tends to be high (3) typing errors (4) time availability (5) technological issues/problems and (6) the response rate usually averages 36.83% (Sheehan, 2001). The data collection procedure ended in December 2009, with a total of 332 questionnaires collected.

4.8 Research Questions

To answer Research Questions 1, 2 and 3, the Pearson and Spearman correlations were used. Non-parametric statistics Spearman $\acute{o}$ correlation was also used. The Pearson r

correlation was used when the dependent and independent factors had an approximately normal distribution.

4.8.1 Research Question 1, 2 and 3

The following statistical methods were employed to answer research question 1, 2 and 3:
The correlation coefficient was used to measure the extent of the association between the independent variables (manager's perceptions of technological, organizational and environmental factors) and each of the dependent variables (B2B outbound communication, B2B inbound communication, B2C outbound communication, and B2C order taking).

Pearson's correlation analysis was used to assess the relationship between the independent variables and the degree of EC acceptance.

Spearman's correlation analysis was used to measure the relationship between each of the independent variables and the degree of EC acceptance in the dependent variables. The relationship will be considered on the strength of R^2.

Frequency and descriptive statistics were also used to measure mean and standard deviation.
Multiple regression analysis was used to measure (1) the extent of the overall adoption prediction and (2) all the dependent variables that had a positive influence on the prediction of the level of EC acceptance.

4.8.2 Research Question 4 (Section 4. The Extent of EC Adoption)

Research Question 4 of the present study is: "What are the factors that can predict the overall extent of adoption of EC from a combination of the technological, organisational and environment factors?"

The objective of this question was to discover the factors that affect the overall acceptance of EC from the following factors: organisational, technological and environmental. Multiple regression analysis was employed to test if there is a relationship between these

factors. The best way to answer this research question was to break up the question into the following-sub questions, and then apply the regression model to each of the sub-questions.

Research Question 4a (B2C Outbound Communication): In a combination of technological, organizational and environmental factors, what can predict the degree of adoption of EC on B2C inbound communication?

Research Question 4b (B2C Order taking): In a combination of technological, organizational and environmental factors, what can predict the degree of adoption of EC on B2C order taking?

Research Question 4c (B2B Inbound Communication): In a combination of technological, organisational and environmental factors, what can predict the degree of adoption of EC on B2B inbound communication?

Research Question 4d (B2B Outbound Communication): In a combination of technological, organizational and environmental factors, what can predict the degree of EC adoption of B2B outbound communication?

Regression Analysis

The reason for using regression analysis is that the dependent variable can be predicted from a group of independent variables. The regression analysis can present the probable correlations of the variables. Analysis of Variance (ANOVA) was used for the significance of the regression model. When the combination of the independent variables was less than .05, ANOVA significantly predicted the dependent variable.

Correlation analysis was applied to all four research questions in order to determine the extent of EC acceptance of the dependent variables (B2B outbound communication, B2B inbound communication, B2C inbound communication and B2C order taking). Regression analysis was used to predict the degree of EC acceptance of B2B inbound communication, B2B outbound, B2C order taking, and B2C inbound communication in all the independent variables, to see if they have a positive influence on the extent of adoption of EC.

4.9 Instrumentation

The questionnaire of the present study is divided into four sections, with a total of ninety-one items in all. The four sections are: technological context, organisational context, environmental context and the degree of EC acceptance. The 5-point Likert scale in the present study was used because it is an effective method for obtaining reliable survey responses. The Likert scale also allows the respondents feedback that is more expansive than a close-ended question, but easier to quantify compared to a completely open-ended response. Table 4.1 shows the questionnaire items for each concept.

Cronbach's (1971) coefficient alpha method has been employed to examine the dependability of multi-item measurement and to perform a reliability test of the eight independent variables and the four dependent variables, especially as the variables in the study are multiple Likert-types. According to Leech, Barrett & Morgan, (2005), Cronbach's alpha should be above 0.7 and Igbaria & Livari (1995) suggest that the average variance should be above 0.5.

A Cronbach alpha test was employed to determine the reliability of the instrument. The test measured consistency of the scale items and the results are discussed for each of the variables.

Table 4.1 Structure of the Questionnaire

Part	Name	Items
1	Technological context	26
2	Organisational context, including organisational profile	22
3	Environmental context	10
4	Extent of EC adoption	17

Managers' profiles were measured by five items that the researcher developed; these items were age, gender, qualification, experience and location. The operational measures are as follows:

Table 4.2 Items to measure manager's profile

Item	**Scale**	**Level of category**
Age	5 categories	Years
Gender	2 categories	Sex
Experience	Years of working	Years
Qualification	Diploma	Years
Hotel Location	9 categories	Provinces in the country

4.9.1 Technological Context

The attributes used by Rogers (2003) and Tornatzky & Fleischer (2003) (relative advantage, compatibility, and complexity) were employed in the technological context because they are widely recognized to have an influence in technology adoption (Zhu *et al.*, 2003; Wang & Qualls, 2007; Toe *et al.,* 2006).

Table 4.3 Attributes of innovation

Construct	**Items**
Relative Advantage	17 items
Have Internet	Dichotomous checklist: Yes or No
Reason if no Internet	3 levels of checklist
Number of years hotel has had features	12 items from a checklist of 6
Compatibility	4 items
Complexity	4 items

The primary characteristics that were used in the study are: relevant advantage, which had a 17-item scale; compatibility, which had a 4-item scale; and complexity, which had a 4-

item scale. The respondents had to select one option out of the five-point Likert scales used in measuring the items. Each question's possible answer ranged from 'strongly disagree' to 'strongly agree'. Cronbach's alpha for relative advantage was 0.867, for compatibility it was 0.856, and for complexity it was 0.856. The questions were thus found to be reliable in terms of consistency of items.

4.9.2 Organisational Context

Table 4.4 Constructs of organizational factors

Construct	**Items**
Size	4 items
Ownership of hotel	3 levels of checklist
Number of employees	5 levels of checklist
Number of rooms	5 levels of checklist
Guest room rating	5 levels of checklist
Attitude	12 items
Knowledge	6 items

Organisational context can be classified into i.e. organisational structure and organisational process (Tornatzky & Fleischer, 1990). Organisational size was the only characteristic for organisational structure. To measure the organisational size, 4 items were developed. These were: the ownership of the hotel, number of employees, number of rooms, and hotel room rating. For the organisational processes, the following two characteristics of managers were investigated in this study: (1) the manager's attitude toward EC adoption and (2) the manager's technological knowledge. The manager's attitude was measured by 12 items and the manager's technological knowledge was measured by 6 items. The respondents had to select one option out of the five-point Likert scales used in measuring the items. Each question's possible answer ranged from 'strongly disagree' to 'strongly agree'. Cronbach's alpha for the manager's attitude was 0.699. The questions were thus found to be reliable in terms of consistency of items.

4.9.3 Environmental Context

Environmental factors included in this study were: information intensity and competition. 4 items were used to measure information intensity, and competition was measured by 6 items.

Table 4.5 Constructs of environmental factors

Construct	**Items**
Information intensity	4 items
Competition	6 items

Competition is "the degree of competition in the environment within the industry in which the organisation operates" (Cash, McFarlan, McKenny & Lynda, 2008: 65)**.** Information intensity is "the degree of information that is present in the product or service of an organization" (Chathoth, 2007: 397). Cronbach's alpha for information intensity was 0.905 and for competition 0.912. The questions were thus found to be reliable in terms of consistency of items.

4.9.4 Extent of Adoption of Electronic Commerce

The extent of adoption of EC was measured by: 5 items for B2C outbound communication with customers, 4 items for B2C order taking, 4 items for B2B inbound communication and 4 items for B2B outbound communication with suppliers. The study focused on the two interfaces, which are: supplier (B2B EC operations) and customer (B2C EC) operations. 17 items were used to assess the four business processes of EC. The respondents had to select one option out of the five-point Likert scale used in measuring the items ranging from 'strongly disagree' to 'strongly agree.'

Table 4.6 Constructs of the Extent of e-Commerce Adoption

Construct	**Items**	**Operationalisation**
B2C Outbound communication	5	Electronic communication with customers
B2C Order taking	4	Online order taking
B2B Outbound communication	4	Electronic communication with suppliers
B2B Inbound communication	4	Electronic communication with customers

Cronbach's alpha for:
B2C inbound communication was: 0.740
B2C order taking was: 0.650
B2B outbound communication: 0.794
B2B inbound communication: 0.886.

Each of Cronbach's coefficients for the dependent variables was above 0.7 (except for B2C order taking) which is sufficient for internal consistency reliability as suggested by Leech *et al.,* (2005).

4.10 Data Analysis

The Statistical Package for Social Sciences (SPSS) has been used for the data analysis of this study. The data analysis procedure used is as follows:

Data coding – numbers were assigned to the values of each variable.

Exploratory analysis – descriptive statistics were used to check tests (e.g. analysis of variance, t-test, Pearson correlation and multiple regressions).

Exploratory Factor Analysis (EFA) – this was applied so as to assess the underlying structure of the managers' perceptions and characteristics of the degree of EC adoption (see Appendix 2).

The Pearson and Spearman correlation – these were used to answer Research Questions 1, 2 and 3. The Pearson correlation was used to assess the strength and the relationship

between the independent and the dependent variables. The correlation shows whether there is a negative or positive relationship. The advantage is that if two variables are related a prediction can be made based on one variable.

Multiple Regressions – these were used to answer Research Question 4 and also to analyse the association between each of the exploratory and dependent variables.

Multivariate Analysis of Variance (MANOVA) – this was used to analyse, for example, managers' genders and the organisation's website as well as the interactions between them and the extent of EC adoption.

4.11 Limitations

This section discusses the limitations of the study in relation to the methodology used. At the time the data was collected, most of the hotels were being renovated for the FIFA World Cup. It is possible that the information collected at that time has now changed. In addition, the month of December is a very busy month for hotels. Most hotels were not willing to answer the questionnaire. Finally, only the manager of each hotel participated, who may not represent the actual strategy of the organisation. This may affect the internal validity of this study.

4.12 Conclusion

In conclusion, the research design and methodology for the study were as follows:

The research design used for this study was an empirical study, where data was collected by self-administered questionnaires using a quantitative descriptive survey. Correlational and descriptive research survey was used. The descriptive design was used because it looks the present status of adoption of EC. There were eight independent variables (relative advantage, compatibility, complexity, organisational size, technology knowledge, the manager's attitude, information intensity and competition) that were used and four dependent variables (B2B outbound communication, B2B inbound communication, B2C inbound communication and B2C order taking).

The hotels used had to be one of the three groups that had been suggested by the Tourism Council. N=1500 and n=400, a table with random numbers was used to select 400 hotels. Before the study was done, a pilot study was carried out, it was satisfactory and therefore no changes were made to the original questionnaire. The data collection procedure took five months. The data consisted of 91 items which were captured, cleaned and coded using SPSS15.0. The independent variables had 74 items and the dependent variables had 17 items. Most of the questions expected the participants to use five-point Likert scale measuring the items from 'strongly disagree' to 'strongly agree.'

Spearman's and Pearson's correlation coefficient, multiple regression and other statistical procedures were selected as appropriate measures for identifying statistically significant dominants of EC.

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5. CHAPTER: DATA ANALYSIS AND RESULTS

5.1 Introduction

The current chapter shows the procedural details of the data analysis and also presents the findings of the study. It starts with a socio-demographic descriptive analysis, which presents a summary of the participants' profiles (332 managers). An exploratory factor analysis is employed for measuring the construct validity.

The aim of the study is to identify the determinants of electronic commerce (EC) adoption within the South African hotel industry. The present study therefore examines the correlation between eight independent variables and four EC dependent variables. The independent variables of this study were grouped into three categories: technological (the managers' perceptions of electronic commerce on relative advantage, compatibility and complexity), organisational (organisational size, managers' IT knowledge and managers' attitude EC adoption) and environmental factors (information intensity and competition).

The dependent variables of this study are the degree of adoption of EC on B2C communication, B2C order taking, B2B inbound communication and B2B outbound communication. Multiple regression analysis was adopted for examining the relationship between the dependent variables and the independent variables.

The final section of this chapter uses multivariate analysis of variance (MANOVA) to analyse the differences between the groups of nominal variables (e.g. organisational locations, gender, age of respondent, position and organisational website) according to the extent of EC adoption. All the questionnaires were coded using the Statistical Package for Social Sciences (SPSS).

5.2 Socio-Demographic Descriptive Analysis

Table 5.1: Frequency distribution of sampled (hotels) respondents by location

Province	**Frequency**	**Percentage (%)**
The Western Cape	112	33.7
Gauteng	54	16.3
KwaZulu-Natal (KZN)	43	13.0
Mpumalanga	40	12.0
Limpopo	58	17.5
The Free State	7	2.1
The Eastern Cape	18	5.4
Total	332	100

Of the sampled organisations, 33.7% are located in the Western Cape, 17.5% are in Limpopo and 16.3% are in Gauteng. There are no respondents from the North West and the Northern Cape provinces. The frequency distribution of organisational locations is shown in Figure 5.2 below. The hotels that are used in the study are sampled from three different groups as explained in chapter 4, section 4.3.1. A number of the hotels from the Western Cape appeared in the three groups that were sampled. This is the reason why samples include more hotels from the Western Cape than from any of the other provinces.

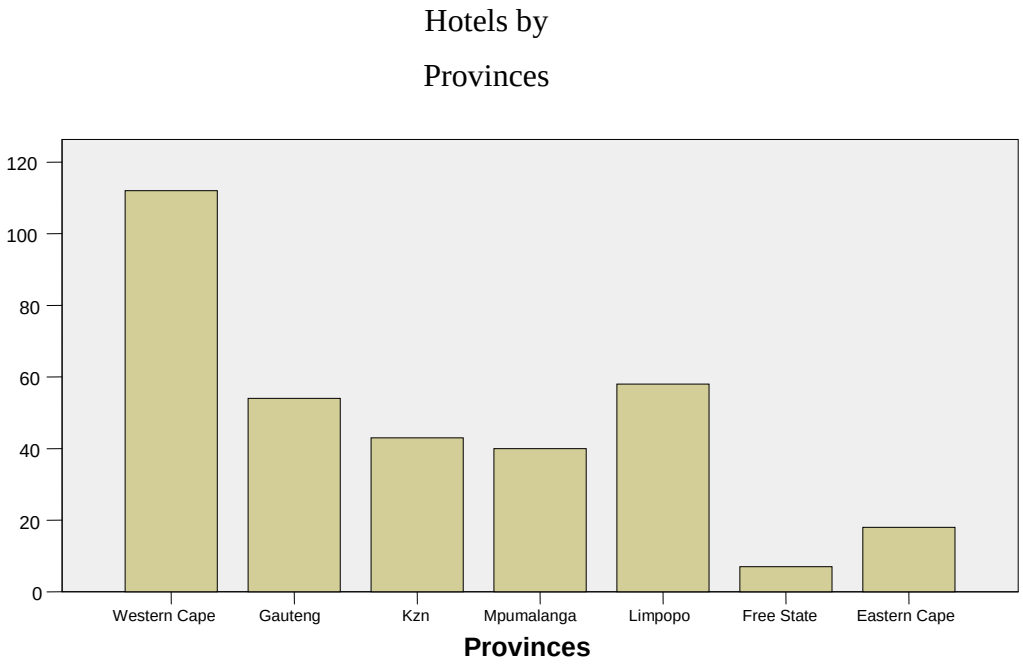


Figure 5.1: Classification of hotels by provinces

Table 5.2: Frequency distribution of sampled managers by age

Age	**Frequency** (F)	**Percentage** (%)
<25	45	19.31
25-35	101	43.35
36-45	56	24.03
46-55	23	9.87
55+	8	3.43
Total	233	100

Of the 332 respondents, 290 responded to this particular question (managers age). Of these 290 respondents, 128 (44.14%) were males and 162 (55.86%) were females. Most of the respondents who were asked to fill in the questionnaire were between 25 and 35 years old. More females than males within this age range answered the questionnaire. There were more managers with formal qualifications who completed the questionnaire, also within this age range. It can be seen in the table that in higher age categories the number of respondents diminished. For example, in the age category 55 years and above, the number of respondents was only 3.43 % of the total number of respondents. When one compares

this figure with the total number of respondents who were in the age category of 25 to 35 years old – i.e. 43.35% of the total number of respondents - it can be concluded that 60% of the respondents may have left the industry by the time they reached age 36. This confirms Zhang & Wu's (2004) study conducted in China, which showed that there is a very high employee turnover rate in the hotel industry of that country. Many hotel employees in China, including managers, evidently regard hotel work as a temporary job that will tide them over until something better can be found. Working in the hotel industry is not considered a lifetime career commitment. The frequency table above (Table 5.1) shows that this appears to be the case in South Africa as well. There are very few older managers (i.e. those in the 46-55 years category) who work in the hotel industry, but there are many (43.35% of the total) younger men and women (i.e. 25-35 years) who work in the industry.

5.2.1 Position in the Organisation

Over seventy eight percent of the respondents are managers; the instrument targeted those respondents who are in a managerial position, the other respondents who were not managers had been asked by the managers to complete the questionnaires on their behalf. Of the total, the respondent who had worked the longest for a hotel had worked there for thirty-five years. Most of the respondents, however, had not been in the hotel industry for that long. Out of all of the respondents, eleven percent reported they had been in the industry for five years and thirteen percent reported that they had been in the industry for three years. Lin & Lee (2005) reported that the turnover problem is worse in large hotels than in small hotels because the hospitality industry is not seen as a career path, but rather as offering one a temporary job which can be undertaken whilst looking for something more permanent.

5.2.2 Qualification

47% of the respondents did not want to disclose their qualification(s). Of those who answered the question about qualifications, nineteen percent reported they had a National Diploma in Management and fourteen percent reported they had a Diploma in Hotel Management. Twenty percent reported that they did not have any qualification; most of these were the owners of the hotels.

5.2.3 Reliability Analysis

Cronbach's coefficient alpha is employed for undertaking a reliability analysis and ten variables from this study are used. Table 5.3 below indicates Cronbach's coefficient alpha for each of the variables.

Table 5.3: Reliability statistics

Variables	**Number of questions**	**Cronbach's alpha (a)**
Relative advantage	36	0.867
Compatibility	4	0.865
Complexity	4	0.856
Manager's attitude	12	0.583
Information intensity	4	0.905
Competition	6	0.912
B2C inbound	5	0.740
B2C order	4	0.650
B2B outbound	4	0.794
B2B inbound	4	0.886

According to Leech *et al.*, (2005), Cronbach's alpha ought to be above 0.7. The values obtained for this study indicate satisfactory alpha values except for manager attitudes and B2C orders, the reason being that certain items on the questionnaire had a significantly negative influence on the variables, as shown in Table 5.3 above. Thus the reliability of the instruments used in this study is considered to be adequate and satisfactory.

5.2.4 Exploratory Factor Analysis

The exploratory factor analysis is used to determine the relationship between variables based on the correlation among them. Exploratory factor analysis helps to identify a set of interrelated variables that represent the underlying construct. The validity of the instrument used is shown through the results of the exploratory factor analysis.

5.2.5 Factor Analysis

The Kaiser-Meryer-Olkin (KMO) test and Bartlett's test had to be examined before one could perform the factor analysis, even though the questions had already been grouped (see Appendix 2). According to Leech *et al.*, (2005), the KMO value should be larger than 0.7, and Bartlett's test should be significant when $p < 0.05$. Bartlett's test reveals whether or not the questions are highly correlated, which will provide a reasonable basis for factor analysis.

KMO table

Three instruments needed to be determined by factor analysis in the present study. These instruments are: the managers' perception of EC, the environmental factors involved and the extent of adoption of EC. The instruments include several variables and each variable comprises several questions, which the participants needed to answer.

Table 5.4: KMO and Bartlett's tests

	KMO	**Bartlett's test**	
	K	**df**	**Sig.**
Manager's perception	0.818	666	.000
Environmental factors	0.863	45	.000
Extent of EC adoption	0.802	136	.000

5.2.6 Extent of Adoption of EC Descriptive Analysis

The categories of EC businesses that are examined in this study are: B2C outbound communication, B2C order taking, B2B inbound communication and B2B outbound communication. According to Leech *et al.*, (2005), values of skewness and kurtosis of variables are examined so as to represent the curve of frequency distribution. They also state that the variable is approximately normal if the skewness and kurtosis of the variables are plus or minus one. As can be seen in Table 5.5 below, most of the variables are approximately normal. The only variable that was not normal is B2C order taking, which had the largest negative value in skewness.

Table 5.5: Descriptive statistics of the extent of EC adoption

	Mean	**SD**	**Skewness**	**Kurtosis**
B2C outbound	3.324	1.0874	-0.2156	0.0574
B2C order taking	3.547631	1.288917	-0.73104	1.735809
B2B inbound	2.379479	1.354459	0.769145	0.329047
B2B outbound	3.097974	1.256711	-0.14192	-0.91972
Overall EC	3.087	1.2477	-0.08	0.3005

5.2.7 Probability.

Probability is a way of quantifying the likelihood of the occurrence of an event. When an outcome cannot be predicted it is said to be a chance. A probability may be seen as the long run relative frequency of an event occurring. The following the rules of a probability for an even A

1. The probability always lies between 0 and 1, with 0 and 1 included that is, $0 \leq P(A) \leq 1$.
2. If A is an impossible event, then $P(A)=0$.
3. If A is a sure event, then $P(A)=1$.

Significance: The result that will be called statistically significant is if it is unlikely to have occurred by chance. Many researchers urge that tests of significance should always be accompanied by effect size. The amount of evidence required to accept that an event occurred by chance is known as the significant level (p-value). If the obtained p-value is small then a null hypothesis is false or an unusual event has occurred.

The significance level is usually denoted by the Greek symbol ά. The significant levels that b have been used in the study range from 10% to 0.1%. If a test of significance gives a *p* value lower than ά it is rejected. The lower the significance level the stronger the evidence.

Skewness is the measure of the asymmetry of the probability of distribution. The skewness can be positive, negative or undefined.

1 Negative skew: the left tail is longer the mass of the distribution is concentrated on the right side. It has relatively low values. The distribution is left skewed.

2. Positive skew: the right tail is longer, the mass of the distribution is concentrated the left side, and it is has relatively high values. The distribution is right skewed.

3. If the distribution is symmetric, then the mean equals the median and there is zero skewness.

Kurtosis is another way of looking at distributional shape that deals with the possibility that a set of scores can be non-normal, even though there is only one mode and even though there is no skewness in the data. This is possible because there may be an unusually large number of scores at the center of the distribution, thus causing the distribution to be overly peaked or smaller than is normal, for example, distributions with both tails being thicker than in the famous bell shaped curve.

1. Kurtosis that is "normal", or mesokurtic, is close or equal to zero.
2. Kurtotosis that is abnormally peaked, or leptokurtic, has positive values.
3. Kurtosis that is abnormally flat, or platykurtic, has negative values.

There are no clear-cut guidelines for interpreting measures of skewness and kurtosis (Huck, 2008), for this study data that is approximately normal for skewness and kurtosis values will be considered at anywhere from -1.0 to +1.0.

Pearson and Spearman correlation

As mentioned in chapter 4, for Research Questions 1, 2 and 3, Pearson and Spearman's correlations are employed to test the relationships between the independent and dependent variables. Pearson's correlation is used when the frequency distribution of the variable is a normal distribution. Spearman's correlation is used when both the variables are abnormal. To see whether or not the variable is normal, the skewness of each variable is measured before examining the correlation between the two variables. As indicated above (Leech *et al*., 2005), the variable is considered normal when the skewness and kurtosis is plus or minus one. In addition, Leech *et al.*, also state that:

1. The result is considered statistically significant if the result level (*p*) is less than .05.
2. When the Pearson or Spearman correlation is positive, the two variables have a positive relationship.
3. When the Pearson or Spearman correlation is negative, the two variables have a negative relationship.
4. The strength of a relationship or its effect size is considered on the basis of the absolute value:
   a) if the value of r is > 0.70 = very large
   b) if the value is between 0.50 and 0.69 = large
   c) if the value is between 0.30 and 0.49 = medium and
   d) if the value is between 0.10 and 0.29 = small

The purpose of the analysis is to determine whether or not there is a relationship between variables. Regression analysis is the appropriate technique for use in this study to see if there is any relationship. The purpose of regression analysis is to relate a dependent variable to a set of independent variables. Regression analysis is applied in answering Questions 1, 2 and 3. To answer Research Question 4, regression analysis is employed. Hence, for Research Questions 4a to 4d, regression is employed. For each of the research

questions R^2 is reported in the study. According to Leech *et al.,* (2005) the following procedural framework is used:

1. ANOVA is employed to test the significance of the regression model.
2. If the results indicate that *p* is less than 0.05, a combination of independent variables significantly predicts the dependent variable.
3. The percentage of the variance could be predicted from a combination of independent variables, if the value varies from 0.0 to 1.0.
4. The strength of a relationship is considered on the basis of the value of R^2:

a) if R^2 value is > 0.49 = very large
b) if R^2 value is between 0.26 and 0.49 = large
c) if R^2 value is between 0.13 and 0.26 = medium and
d) if R^2 value is between 0.02 and 0.13 = small.

5.2.8 Assumptions that underpin the use of regression:

The following are the assumptions that were considered in the regression analysis (Coakes, 2010):

1. Ratio of cases to independent variables - the number of cases needed depends on the type of regression model to be used. For standard or hierarchical regression one should ideally have twenty times more cases than predictors, whereas even more cases are required for stepwise regression.
2. Outliers - extreme cases have considerable impact on the regression solution and should be deleted or modified to reduce their influence. The decision to remove outliers from the data must be made with care because their deletion often results in the generation of further outlying cases.
3. Normality, linearity, homoscedasticity, independence of residuals and examination of residual scatter plots allow one to test the above assumptions. It is assumed that the differences between the obtained and predicted dependent variable scores are normally distributed. Furthermore it is assumed that the residuals have a linear relationship with the predicted dependent variable scores, and that the variance of the residuals is the

same for all predicted scores. Mild deviations from linearity are not serious. Moderate to extreme deviations may lead to a serious underestimation of a relationship.

The analysis that is used in this study is based on the above assumptions.

5.3 Technological Factors

This section presents the data analysis related to Research Question 1 below.

Research Question 1: What is the relationship between each of the technological factors (relative advantage, compatibility and complexity) and the extent of electronic commerce adoption?

The objective of this question is to find out if there is a relationship (if any) between the technological factors and the extent of electronic commerce. To answer this research question, correlation analysis and multiple regression are employed to test if there is a relationship between the factors. The technological factors are: the managers' perceptions of the relative advantage, compatibility and complexity.

To answer this research question, three research sub-questions are presented:

Q1.1: Is there a relationship between relative advantage and the extent of adoption of EC (B2C outbound communication, B2C order taking, B2B inbound communication and B2B outbound communication)?

Q1.2: Is there a relationship between compatibility and the extent of adoption of EC(B2C outbound communication, B2C order taking, B2B inbound communication and B2B outbound communication)?

Q1.3: Is there a relationship between complexity and the extent of adoption of EC (B2C outbound communication, B2C order taking, B2B inbound communication and B2B outbound communication)?

5.3.1 Relative Advantage

Research Question 1.1: Relative advantage: Is there a relationship between relative advantage and the extent of adoption of EC (B2C outbound communication, B2C order taking, B2B inbound communication and B2B outbound communication)?

Perceived relative advantage is a factor that may have an association with the extent of EC adoption. The composite of the seventeen questionnaire items is used to measure the relationship between the managers' perceptions of EC on relative advantage and the extent of EC adoption. Most of the hotels that are sampled believe that EC adoption can bring benefits to their organisation in different fields, such as reducing costs, enhancing their relationships with their suppliers, and increasing sales. Table 5.6 below indicates the descriptive data of the managers' perceptions of EC.

Table 5.6: Descriptive statistics of relative advantage of EC

N	Mean	S.D.	Skewness	Kurtosis
290	3.975664	0.698771	-0.794701	4.571733

Table 5.7: (based on Question 1 from the questionnaire)

Does the hotel have Internet?

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Yes	307	92.5	93.6	93.6
	No	21	6.3	6.4	100.0
	Total	328	98.8	100.0	
*	missing	4			

*there are 4 missing values.

Table 5.8: (based on Question 2 from the questionnaire)

Does the hotel have its own website?

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Yes	314	94.6	95.4	95.4
	No	15	4.5	4.6	100.0
	Total	329	99.1	100.0	
*	missing	3			

*there are 3 missing values

Of the hotels that responded to Question 1 of the questionnaire, ninety-four reported that they have an Internet connection and six percent reported that they do not. The hotels were also asked if they have a website: ninety-five percent have a website and five percent do not. Since most of the hotels have an Internet connection as well as their own websites, the likelihood of hotels adopting EC is very high if other structures are put in place, like proper infrastructure through which hotels can access EC and other necessary IT activities. Esselaar & Miller (2002) state that developing countries usually lack the infrastructure and finance necessary for expansion. UNCTAD (2004) has told hotels that if they want to obtain immediate returns on IT they must put a considerable sum of money into web design and the creation of a sustainable network. It is not surprising though that so many hotels have their own website and also offer Internet services, seeing that South Africa has been recognised as one of the top developing countries in the world when it comes to recruiting trained IT people (Jobodwana, 2009). South African hotels have understood that online supply chain management and procurement can improve their customer relations as well as reduce their costs (Van der Merve & Wocke, 2007). Jobodwana (2009) also states that Internet software browsers are using connectivity as a result of wider access to broadband and an increase in 3G access, even though some of the hotels are complaining that the bandwidth is too small.

Table 5.9: (based on Question 4 of the questionnaire)

Facilities available in the hotel

Tools	**N/A	0-2 yrs.	>2-4 yrs.	>4-6 yrs.	>6-8 yrs.	> 8 yrs.
	*%	%	%	%	%	%
Email-based bookings	6	18	14	14	9	38
Online real-time bookings	21	14	13	9	7	32
Global distribution system	30	10	6	7	4	14
Internet café	47	10	7	7	5	16
Internet in all the guestrooms	50	11	6	7	1	12
Wireless Internet	22	23	18	9	5	18
Property management software	26	10	6	5	2	10
E-checkout from room	86	3	0	2	1	3
Video conferencing	56	7	5	8	3	17
Local area network for back office	13	13	10	13	9	34

*the percentage totals are not 100% because of missing values
**Number of years the hotel has used the facility N/A, 0-2yrs, >2-4 yrs., >4-6yrs, >6-8yrs and >8yrs

Email-based bookings

Only 6% of the respondents reported that they do not use email-based bookings, while ninety-four percent reported they do. The hotels that do not have a website or an Internet connection could well be the same hotels that do not use email-based bookings. Ninety-four percent of the hotels are using an email-based booking, which means that customers can either engage in direct contact with the hotels or they can go through an agency. This data shows that B2C order taking is actually supported by the customers since they are using email-based bookings. EC is being used to attract customers to the hotels. Customers are eliminating the middleman (i.e. agencies) and are making their own bookings at a cheaper rate, since the commission of the middleman has been cut out (Stair *et al*., 2008).

Thirty-eight percent of the respondents have been using email-based bookings for over eight years. Close to fifty percent have been taking email-based bookings from their customers for over six years. This tells us that one of the tools of e-commerce has been used in South Africa for some time already.

Global Distribution System and Property Management System

The Global Distribution System (GDS) is software that is designed for hotels. Forty-three percent of the respondents reported they are not using GDS. Twenty-one percent of the respondents reported that they have been using GDS for over eight years, while others have just started using it. The same applies with Property Management System (PMS): forty-three percent of the respondents do not use PMS in their hotels, while sixteen percent have just started using PMS within the last two years. The hotels that do not have their own software were mainly using Microsoft Office.

Internet café, Internet connection in all guestrooms, and wireless Internet access

Fifty-one percent of the hotels reported that they do not have Internet cafés on offer to their guests and fifty-eight percent reported that they do not have Internet access in all the guestrooms. Most of the hotels (77%), however, reported that they do offer a wireless Internet service. Thus there is no need for these hotels to have Internet access in the guestrooms. An Internet café could be set up for those customers who have not brought their laptops with them but still need to use the Internet. It is unlikely that business people and other customers who are used to using the Internet will leave their laptops at home, as they will want to continue with their work while in the hotel. Only twenty three percent of the hotels reported that they do not offer wireless Internet, although these could be the same hotels which have an Internet café or offer Internet access in the guestrooms.

E-checkout

E-checkout is a facility that is offered by some international hotels, but in South Africa eighty six percent of the guests have to queue to check out of the hotel, by stopping and checking out through the staff member at the reception desk. With e-checkout facilities, a guest can check out electronically and then simply leave the room key at the reception

desk. When guests wish to leave, they can make an electronic payment to the hotel and then leave, not having to go through the inconvenience of queuing at the reception desk. This is one area where hotels in South Africa still need to improve; a large percentage of South African hotels still expect their guests to queue in order to check out. Maswera, *et al., (*2009) suggest that for sensitive data such as credit card details and other personal information that is entered into an EC system must be protected. For an EC system to be successful it needs a high level of security. It is possible that E-checkout facility is not yet fully protected and the korganisations have to put that in place first.

Table 5.10 shows that there was a positive correlation with most of the questions, except for Question 4.8, which documents the use of e-checkout from the room. The low reported use of e-checkout (86%) accounts for this. There was no correlation between Question 4.5 (Internet in all guestrooms) and Question 4.1 (email-based bookings).

Table 5.10: Correlation among the facilities available in the hotel

Variable P. value	**Q4-1**	**Q4-2**	**Q4-3**	**Q4-4**	**Q4-5**	**Q4-6**	**Q4-7**	**Q4-8**	**Q4-9**	**Q4-10**
Q4.1										
Q4.2	.000									
Q4.3	.000	.000								
Q4.4	.000	.000	.000							
Q4.5	**.177**	.000	.000	.000						
Q4.6	.000	.000	.000	.000	.000					
Q4.7	.000	.002	.000	.000	.000	.000				
Q4.8	**.607**	**.056**	.000	**.056**	**.429**	**.233**	**.372**			
Q4.9	.000	.000	.000	.000	.000	.000	.033	.013		
Q4.10	.000	.000	.000	.000	.000	.000	.000	**.654**	.000	

Table 5.11 below indicates the four categories of EC adoption as well as the strength of the relationship of a manager's perception of EC on relative advantage. To examine the association between a manager's perception on relative advantage and the extent of EC adoption, Pearson *r* correlation analysis is employed. All four categories show a negative

relationship with the extent of adoption of EC. The four categories of EC adoption are not statistically significant. It can be concluded, therefore, that the findings did not support the assumption that there could be a relationship between management perceptions of EC on relative advantage and each of the four categories.

Table 5.11: Correlation analysis of relative advantage

	Correlation	**Sig.**	**Remark**
B2C outbound communication	0.0328	1.	Not significant
B2C order taking	.117	1.	Not significant
B2B inbound communication	.029	1.	Not significant
B2B outbound communication	0.13	1.	Not significant

Multiple regression analysis (Relative Advantage)

Table 5.12: B2C outbound communication

Questions	Coef.	Std. Err.	T	Pt	Remarks
Province	-.2007511	.0486719	-4.12	0.000	Sig.
Q1: Is there Internet?	-.6260239	.362523	-1.73	0.086	Not sig.
Q2: Is there a website?	-.7118938	.4030555	-1.77	0.079	Not sig.
Gender	.2428013	.1669	1.45	0.148	Not sig.
Age	-.0055417	.0779134	-0.07	0.943	Not sig.
Q5.1: Can reach international markets	.0088854	.4751967	0.02	0.985	Not sig.
Q5.2: Can sell products and services	-2.082281	1.096132	-1.90	0.059	Not sig.
Q5.3: Saves time in searching	1.062123	1.16378	0.91	0.363	Not sig.
Q5.4: Can gain IT expertise	.011752	.5697057	0.00	0.998	Not sig.
Q5.5: Can purchase products & services	-.1004384	.5986651	-0.17	0.867	Not sig.
Q5.6: Learn more about competitors	.0315554	.7716018	0.04	0.967	Not sig.
Q5.7: Can advertise & market	.4820129	.9114601	0.53	0.598	Not sig.
Q5.8: Provides timely information	.3177373	1.702863	0.19	0.852	Not sig.
Q5.9: Enhances company's image	2.088799	1.335419	1.56	0.120	Not sig.
Q5.10: Can gather information	-.9840629	2.437155	-0.40	0.687	Not sig.
Q5.11: Can reduce costs	1.846849	.764323	2.42	0.017	Sig.
Q5.12: Can increase competitiveness	-.3261756	1.646704	-0.20	0.843	Not sig.
Q5.13: Profits have increased	-.3648083	.9852438	-0.37	0.712	Not sig.
Q5.14: Can increase productivity	1.659524	1.062639	1.56	0.120	Not sig.
Q5.15: Enhances relationship with supplier	-1.441779	.7573698	-1.90	0.059	Not sig.

For a unit increase in B2C outbound communication, there is a decrease in province by 0.2 units, a decrease in Q1 by 0.6 units, a decrease in Q2 by 0.7, an increase in gender by 0.2 units and a decrease in age by 0.01 unit.

For a unit increase in B2C outbound communication, there is a decrease in the following questions; in Q5.2 by 2.1 units, in Q5.5 by 0.1 units, in Q5.10 by 1 unit, in Q5.12 by 0.3 units, in Q5.13 by 0.4 units and in Q5.15 by 1.4 units.

For a unit increase in B2C outbound communication, there is an increase in the following questions; in Q5.1 by 0.01unit, in Q5.3 by 1 unit, in Q5.4 by 0.01 units, in Q5.6 by 0.03 units, in Q5.7 by 0.5 units, in Q5.8 by 0.3 units, in Q5.9 by 2 units, in Q5.11 by 1.8 units and in Q5.14 by 1.7 units.

Table 5.13: B2C order taking

Questions	**Coef.**	**Std. Err.**	**T**	**Pt**	**Remarks**
Province	-.141164	.0396372	-3.56	0.000	Sig.
Q1: Is there Internet?	-.8505896	.2952303	-2.88	0.004	Sig.
Q2: Is there a website?	-.7585795	.328239	-2.31	0.022	Sig.
Gender	.1737891	.1359194	1.28	0.203	Not sig.
Age	.014095	.0634508	0.22	0.824	Not sig.
Q5.1: Can reach international markets	-.1711294	.3869891	-0.44	0.659	Not sig.
Q5.2: Can sell products and services	-2.410999	.892664	-2.70	0.008	Sig.
Q5.3: Saves time in searching	1.075612	.9477551	1.13	0.258	Not sig.
Q5.4: Can gain IT expertise	-.5192339	.4639551	-1.12	0.265	Not sig.
Q5.5: Can purchase products & services	.458906	.4875389	0.94	0.348	Not sig.
Q5.6: Learn more about competitors	.3059116	.6283746	0.49	0.627	Not sig.
Q5.7: Can advertise & market	-.1541538	.7422719	-0.21	0.836	Not sig.
Q5.8: Provides timely information	.9044164	1.386772	0.65	.0515	Not sig.
Q5.9: Enhances company's image	2.197865	1.087534	2.02	0.045	Sig.
Q5.10: Can gather information	-1.354638	1.984762	-0.68	0.496	Not sig.
Q5.11: Can reduce costs	1.242769	.6224468	2.00	0.047	Sig.
Q5.12: Can increase competitiveness	-1.404019	1.341037	-1.05	0.297	Not sig.
Q5.13: Profits have increased	-.1849468	.8023596	-0.23	0.818	Not sig.
Q5.14: Can increase productivity	9193393	.8653882	1.06	0.290	Not sig.
Q5.15: Enhances relationship with supplier	-1.081622	.6167844	-1.75	0.081	Not sig.

For a unit increase in B2C order taking, there is a decrease in province by 0.1 units, a decrease in Q1 by 0.9 units, a decrease in Q2 by 0.8 units, and an increase in gender by 0.2 units and a decrease in age by 0.01 unit.

For a unit increase in B2C order taking, there is a decrease in the following questions; in Q5.1 by 0.2 units, in Q5.2 by 2.4 units, in Q5.4 by 0.5 units, in Q5.7 by 0.2 units, in Q5.10 by 1.4 units, in Q5.12 by 1.4 units, in Q5.13 by 0.2 units and in Q5.15 by 1.1 units.

For a unit increase in B2C order taking, there is an increase in the following questions; in Q5.3 by 1.1 units, in Q5.5 by 0.5 units, in Q5.6 by 0.3 units, in Q5.8 by 0.9 units, in Q5.9 by 2.2 units, in Q5.11 by 1.2 units and in Q5.14 by 0.9 units.

Table 5.14: B2B inbound communication

Questions	**Coef.**	**Std. Err.**	**T**	**Pt**	**Remark**
Province	-.1766399	.0631358	-2.80	0.006	Sig.
Q1: Is there Internet?	-1.240625	.4702548	-2.64	0.009	Sig.
Q2: Is there a website?	.6127803	.5228324	1.17	0.243	Not sig.
Gender	.2836033	.216498	1.31	0.192	Not sig.
Age	-.0630585	.1010671	-0.62	0.534	Not sig.
Q5.1: Can reach international markets	-.1296128	.616412	-0.21	0.834	Not sig.
Q5.2: Can sell products and services	-2.314526	1.421872	-1.63	0.105	Not sig.
Q5.3: Saves time in searching	.5547463	1.509623	0.37	0.714	Not sig.
Q5.4: Can gain IT expertise	-.5870534	.7390065	-0.79	0.428	Not sig.
Q5.5: Can purchase products & services	.0441596	.7765718	0.06	0.955	Not sig.
Q5.6: Learn more about competitors	1.341138	1.000901	1.34	0.182	Not sig.
Q5.7: Can advertise & market	-.7716767	1.182321	-0.65	0.515	Not sig.
Q5.8: Provides timely information	-.1412521	2.208906	-0.06	0.949	Not sig.
Q5.9: Enhances company's image	1.965667	1.732268	1.13	0.258	Not sig.
Q5.10: Can gather information	-.0735303	3.161409	-0.02	0.981	Not sig.
Q5.11: Can reduce costs	1.157931	.9914586	1.17	0.244	Not sig.
Q5.12: Can increase competitiveness	-2.079793	2.136058	-0.97	0.332	Not sig.
Q5.13: Profits have increased	-.1767073	1.278031	-0.14	0.890	Not sig.
Q5.14: Can increase productivity	.3093218	1.378425	0.22	0.823	Not sig.
Q5.15: Enhances relationship with supplier	-.8096654	.9824392	-0.82	0.411	Not sig.

For a unit increase in B2B inbound communication, there is a decrease in province by 0.1 units, a decrease in Q1 by 0.1 units, an increase in Q2 by 0.6 units and increase in gender by 0.2 units and a decrease in age by 0.1 units.

For a unit increase in B2B inbound communication, there is a decrease in the following questions; in Q5.1 by 0.1 units, in Q5.2 by 2.3 units, in Q5.4 by 0.6 units, in Q5.7 by 0.7 units, in Q5.8 by 0.1 units, in Q5.10 by 0.1 units, Q5.12 by 2.1 units, in Q5.13 by 0.2 units and in Q5.15 by 0.8 units.

For a unit increase in B2B inbound communication, there is an increase in the following questions; in Q5.3 by 0.6 units, in Q5.5 by 0.04 units, in Q5.6 by 1.3 units, in Q5.9 by 2 units, in Q5.11 by 1.2 units and in Q5.14 by 0.3units.

Table 5.15: B2B outbound communication

Questions	**Coef.**	**Std. Err.**	**T**	**Pt**	**Remark**
Province	-.4031071	.0559851	-7.20	0.000	Sig.
Q1: Is there Internet?	-.2070417	.4169941	-0.50	0.620	Not sig.
Q2: Is there a website?	-1.408657	.4636168	-3.04	0.003	Sig.
Gender	.1388899	.1919776	0.72	0.470	Not sig.
Age	-.0314961	.0896203	-0.35	0.726	Not sig.
Q5.1: Can reach international markets	.837544	.5465976	1.53	0.127	Not sig.
Q5.2: Can sell products and services	-.9055674	1.260831	-0.72	0.474	Not sig.
Q5.3: Saves time in searching	.527327	1.338644	0.39	0.694	Not sig.
Q5.4: Can gain IT expertise	.6976716	.6553072	1.06	0.289	Not sig.
Q5.5: Can purchase products & services	.1942832	.6886178	0.28	0.778	Not sig.
Q5.6: Learn more about competitors	-.1420068	.8875393	-.016	0.873	Not sig.
Q5.7: Can advertise & market	.6711105	1.048412	0.64	0.523	Not sig.
Q5.8: Provides timely information	.2739622	1.958727	0.14	0.889	Not sig.
Q5.9: Enhances company's image	1.507237	1.536073	0.98	0.328	Not sig.
Q5.10: Can gather information	-1.2282	2.80335	-0.44	0.662	Not sig.
Q5.11: Can reduce costs	1.525191	.8791667	1.73	0.085	Not sig.
Q5.12: Can increase competitiveness	1.911652	1.89413	1.01	0.314	Not sig.
Q5.13: Profits have increased	-.4800044	1.133282	-0.42	0.672	Not sig.
Q5.14: Can increase productivity	.7644522	1.222306	0.63	0.533	Not sig.
Q5.15: Enhances relationship with supplier	-1.506522	.8711689	-1.73	0.086	Not sig.

For a unit increase in B2B outbound communication, there is a decrease in province by 0.4 units, a decrease in Q1 by 0.2 units, a decrease in Q2 by 1.4 units and increase in gender by 0.1 units and a decrease in age by 0.3 units.

For a unit increase in B2B outbound communication, there is a decrease in the following questions; in Q5.2 by 0.9 units, in Q5.6 by 0.1 units, in Q5.10 by 1.2 units, in Q5.13 by 0.5 units and in Q5.15 by 1.5 units.

For a unit increase in B2B outbound communication, there is a an increase in the following questions; in Q5.1 by 0.8 units, in Q5.3 by 0.5 units, in Q5.4 by 0.7 units, in Q5.5 by 0.2 units, in Q5.7 by 0.7 units, in Q5.8 by 0.3 units, in Q5.9 by 1.5 units, in Q5.11 by 1.5units, in Q5.12 by 1.9 units and in Q14 by 0.8 units.

Table 5.16: Summary of the questions on relative advantage in relation to the dependent variables

Questions	**B2C outbound**	**B2C order taking**	**B2B inbound**	**B2B outbound**
	P value	**P value**	**P value**	**P value**
Q1: Is there Internet?		0.004	0.009	
Q2: Is there a website?		0.022		0.003
Q5.2: Can sell products and services		0.008		
Q5.8: Provides timely information		.0515		
Q5.9: Enhances company's image		0.045		
Q5.11: Can reduce costs	0.017	0.047		

Discussion

Seventeen questions are used to measure the relationship between relative advantage and the extent of EC adoption. B2C order taking had the highest number of variables that are significant to the question posed in the present study. B2B, with both inbound and outbound communications, did not have any variable that is significant in relation to managements' perception about EC adoption, meaning that the questions on relative

advantage had no significance to the other two dependent variables. What was significant with the two dependent variables is having Internet connection and having a website. B2C order taking has six questions that are significant, out of a total of seventeen questions. All the other variables have one question out of the seventeen that is significant.

For B2C order taking, it is important to the hotels that they can sell their products to customers. There should be more customers who will place orders and the hotel must provide timely information to its customers so that it does not lose them. It is important that a hotel has a good image and that EC is seen as being advantageous in this area. When customers make use of the Internet and/or a hotel's website, they are able to immediately buy the product that is being offered by the hotel. Such a service enhances the image of an organisation, especially if information is promptly sent to the customer after an order has been placed. By having the option of using the Internet to make bookings, customers (and the hotel) are able to cut down on their costs.

Table 5.17: Multiple regression analysis on the extent of adoption of EC on relative advantage

Equation	**RMSE**	**R-sq**	**F**	**P**
B2C outbound communication	1.080	0.231	2.53	.000
B2C order taking	.879	.296	3.55	.000
B2B inbound communication	1.401	.149	1.484	.092
B2B outbound communication	1.243	.368	4.95	.000

RMSE = Root Mean Square Error

On the extent of the overall adoption prediction, three of the dependent variables have a positive influence on the extent of adoption of EC on relative advantage. The dependent variables significantly contribute to the model for predicting the extent of adoption of EC on relative advantage. The only dependent variable that does not significantly contribute to the model in relative advantage is B2B inbound communication.

The R^2 overall variation is explained by the independent variables in the model. In the case of B2B outbound communication order taking, the value is .368, which means that 36.8%

of the variance in the overall extent of adoption of EC on relative advantage prediction is explained by this model. The strength of the relationship in this model is large.

Conclusion

Most of the hotels reported they have their own website and are also connected to the Internet. The customers are using email-based bookings and sometimes they also use online real-time bookings. There are few hotels that have an Internet café because the majority of them are offering a wireless Internet connection.

According to the study a number of the hotels do not use GDS or PMS but instead do their work by means of Microsoft Office. GDS and PMS are both software packages/applications intended for the hospitality industry. E-checkout is a facility that is not being used by most hotels in South Africa; such hotels want their customers to queue when checking out, but at the same time they want them to use e-payment.

B2C order taking is the one with the most significant responses in terms of relative advantage, probably because it deals with issues that affect customers a great deal. It is the customers who are most interested in seeing the website of a hotel as websites help them to know more about the hotel they are booking; as a result of this, the customers will want to correspond with the hotel electronically. Therefore, it makes the Internet a requirement for the hotels. Once the customer sees a hotel through its website, that hotel's image is enhanced. Customers also want to see the products and services that a hotel is offering, and, if they need information, they must receive it promptly as there will be other hotels offering similar products.

5.3.2 Compatibility

Research Question 1.2: Is there a relationship between compatibility and the extent of adoption of EC (B2C outbound communication, B2C order taking, B2B inbound communication and B2B outbound communication)?

A composite of four items on the questionnaire is used to measure the relationship between a manager's perception and the extent of EC adoption. The descriptive statistics shows a

mean score of 4.257. Most of the hotels that were sampled agreed that EC is compatible with their organisations as to experiences, values, beliefs, business needs and activities. Table 5.18 below shows the descriptive data of managers' perceptions of EC adoption.

Table 5.18: Descriptive statistics of compatibility of EC

N	**Mean**	**S.D.**	**Skewness**	**Kurtosis**
316	4.257	.719	-.0953	1.622

Table 5.19, below, indicates the four categories of EC adoption and the strength of the relationship between the variables and management perceptions of EC adoption on compatibility. Cronbach's alpha value for this set of questions is 0.865. This is very high, indicating consistency of responses. To investigate the relationship between a manager's perception on compatibility and the extent of adoption of EC, Pearson *r* correlation analysis is applied. All four dependent variables showed a positive relationship with the extent of EC adoption. It can be concluded, therefore, that there is a positive relationship between management perceptions and each of the four dependent variables since they are all significant. The strength of the association between management perceptions of adoption of EC on compatibility, and each of the four dependent variables of EC adoption from lowest to highest, is shown below.

Table 5.19: Correlation analysis of compatibility with the extent of EC adoption

	Correlation	**Sig.**
B2C outbound communication	.165**	.003
B2C order taking	.244**	.000
B2B inbound communication	.143*	.011
B2B outbound communication	.347**	.000

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

B2B inbound communication

The statistical significance of compatibility in B2B inbound communication is at the significant level of 0.05. Between the compatibility and the extent of adoption of EC on B2B inbound communication the correlation coefficient *r* is 0.143. The effect is positive; the strength of the relationship is small.

B2C outbound communication

The statistical significance of compatibility in B2C outbound communication is at the significant level of 0.01. Between the compatibility and the extent of adoption of EC on B2C outbound communication, the correlation coefficient *r* is 0.165. The effect is positive; the strength of the relationship is small.

B2C order taking

The statistical significance of compatibility in B2B inbound communication is at the significant level of 0.01. Between the compatibility and the extent of adoption of EC on B2B inbound communication, the correlation coefficient *r* is 0.244. The effect is positive; the strength of the relationship is small.

B2B outbound communication

The statistical significance of compatibility in B2B outbound communication is at the significant level of 0.01. Between the compatibility and the extent of adoption of EC on B2B outbound communication, the correlation coefficient *r* is 0.347. The effect is positive; the strength of the relationship is medium.

Multiple regression analysis on compatibility

Table 5.20: B2C outbound communication

Questions	Coef.	Std. Err.	t	Pt	Remark
Q6.1: Compatible with business needs	.0844749	.7532663	0.11	0.911	Not sig.
Q6.2:Compatible with customers' technology	.6799674	.7377358	0.92	0.358	Not sig.
Q6.3: Compatible with IT infrastructure	1.389577	.6470641	2.15	0.033	Sig.
Q6.4: Compatible with activities used by supplier	-.75977	.493322	-1.54	0.125	Not sig.

For a unit increase in B2C outbound communication, there is an increase in Q6.1 by 0.1 units, in Q6.2 by 0.7 units, in Q6.3 by 1.4 units and a decrease in Q6.4 by 0.7 units.

Table 5.21: B2C order taking

Questions	Coef.	Std. Err.	t	Pt	Remark
Q6.1: Compatible with business needs	-1.455074	.6338072	-2.30	0.023	Sig.
Q6.2: Compatible with customers' technology	.0615264	.6207396	0.10	0.921	Not sig.
Q6.3: Compatible with IT infrastructure	1.563499	.5444474	2.87	0.005	Sig.
Q6.4: Compatible with activities used by supplier	.2429913	.415087	0.59	0.559	Not sig.

For a unit increase in B2C order taking, there is a decrease in Q6.1 by 1.5 units, and an increase in Q6.2 by 0.06 units, in Q6.3 by 1.6 units and in Q6.4 by 0.2 units.

Table 5.22: B2B inbound communication

Questions	Coef.	Std. Err.	t	Pt	Remark
Q6.1: Compatible with business needs	-1.175698	.9945065	-1.18	0.239	Not sig.
Q6.2: Compatible with customers' technology	.4119836	.9740021	0.42	0.673	Not sig.
Q6.3: Compatible with IT infrastructure	.7703998	.8542921	0.90	0.368	Not sig.
Q6.4: Compatible with activities used by supplier	.1192581	.6513127	0.18	0.855	Not sig.

For a unit increase in B2B inbound communication, there is a decrease in Q6.1 by 1.2 units, and an increase in Q6.2 by 0.04 units, Q6.3 by 0.8 units and Q6.4 by 0.1 units.

Table 5.23: B2B outbound communication

Questions	Coef.	Std. Err.	T	Pt	Remark
Q6.1: Compatible with business needs	.4103267	.9171936	0.45	0.655	Not sig.
Q6.2: Compatible with customers' technology	-.7756239	.8982832	-0.86	0.389	Not sig.
Q6.3: Compatible with IT infrastructure	2.16214	.7878794	2.74	0.007	Sig.
Q6.4: Compatible with activities used by supplier	-.7267055	.6006797	-1.21	0.228	Not sig.

For a unit increase in B2B outbound communication, there is an increase in Q6.1 by 0.4 units, a decrease in Q6.2 by 0.8 units, an increase in Q6.3 by 2.2 units and a decrease in Q6.4 by 0.8 units.

Table 5.24: Summary of significant items of compatibility in relation to dependent variables

Questions	**B2C outbound**	**B2C order taking**	**B2B inbound**	**B2B outbound**
	P value	P value	P value	P value
Q6.1: Compatible with business needs		0.023		
Q6.3: Compatible with IT infrastructure	0.033	0.005		0.007

Discussion

Four items are used to measure the relationship between compatibility and the extent of EC adoption. One of the two items on compatibility that is significant is Q6.1 (i.e. compatible with business needs); 90% of the respondents stated that EC was compatible with the business needs of the hotels. B2C order taking shows that EC is compatible with the business needs of hotels and the values of the hotels. For example, they could book and obtain a response from the hotel, which is the value and core business of the hotel.

The second of the two items on compatibility that is significant is Q6.3. This question, which looks at EC compatible with IT infrastructure, is found to be significant to all the variables, except B2B inbound communication. B2C outbound communication, B2B outbound communication and B2C order taking are variables that need the infrastructure more than B2B inbound communication. B2B inbound communication needs internal communication (intranets), therefore, it needs limited infrastructure compared with the other variables. Of the respondents, 83.73% agreed that EC is compatible with the IT infrastructure.

The items that are not significant are Q6.2 (i.e. compatible with customers' technology) and Q6.4 (compatible with activities used by supplier), meaning that it is of no importance to hotels that EC is compatible with their customers' technology or compatible with the activities adopted by their suppliers and partners. Different customers and suppliers use different technologies, but, with current globalisation, compatibility with the technology of one's suppliers would make the work of hotels a great deal easier, especially in the case of

a value chain. Many costs would be cut down and hotels would benefit greatly in inbound logistics, for example.

The hotels also found that it was compatible with their IT infrastructure. In other words, they did not have a problem with the usage of EC because of a lack of technology infrastructure. EC is compatible with all the variables, except with B2B inbound communication.

Table 5.25: Multiple regression analysis on the extent of adoption of EC on compatibility

Equation	**RMSE**	**R-sq**	**F**	**P**
B2C outbound communication	1.052	0.212	5.688	.000
B2C order taking	.885	.203	5.377	.000
B2B inbound communication	1.388	.107	2.519	.009
B2B outbound communication	1.281	.278	8.115	.000

RMSE = Root Mean Square Error

With regard to the extent of the overall adoption prediction, all the dependent variables had a positive influence on the extent of adoption of EC on compatibility prediction. The dependent variables significantly contributed to the model for predicting the extent of adoption of EC on compatibility prediction.

The R^2 overall variation is explained by the independent variables in the model. In the case of B2C outbound communication, the value is .278, which means that 27.8% of the variance in the overall extent of adoption of EC on compatibility prediction is explained by this model. According to Leech *et al.,* (2005), the effect size of this model is large.

Table 5.26: Association between EC and compatibility

	Questions	**Chi**	**Fisher's**	**Remark**
1	EC is compatible with the business needs and values of the hotel	9.596	.035	Sig.
2	EC is compatible with customers' technology	4.75	.086	Not sig.
3	EC is compatible with infrastructure	5.91	.067	Not sig.
4	EC is compatible with the activities adopted by our suppliers	5.54	.050	Sig.

Fifty percent of the answers indicate that there is no relationship between hotels having EC and compatibility. With regard to Question 1 above, there is an association between EC and the business needs and values of the hotel. The main core business of the hotel is to attract customers and, if EC is compatible, it means it is addressing the core business needs of the hotel.

EC is seen as being compatible with the activities adopted by the suppliers of the hotel, which means that EC has made things easier between hotels and their suppliers. It could be that the hotels no longer have to fill out orders manually as this can be done electronically, or that the suppliers could be linked to the hotel, know their order quantities and thus know when to deliver the goods. By EC being compatible to the supplier as well, it means hotels no longer have to keep large stocks of goods. They also, therefore, no longer have to have large warehouses, because they are linked to the suppliers. EC has also helped hotels to invest their money instead of having money tied up in stock, which could become obsolete, when it could be used somewhere else (Kotler and Kevin, 2010). Even though EC has made communication easier, there is still the problem of there not being enough broadband Internet in South Africa (Molla & Licker, 2007).

Conclusion

It has been seen that EC is compatible with the business needs of hotels, which are the core business of hotels. The infrastructure is also perceived to be compatible with EC, so EC

ought to be easily adopted by hotels in South Africa. Hotels are also taking advantage of the value chain. Even though EC is compatible with infrastructure, there is still the problem of bandwidth in South Africa, an issue that the government is now beginning to address.

5.3.3 Complexity

Research Question 1.3: Is there a relationship between complexity and the extent of adoption of EC (B2C outbound communication, B2C order taking, B2B inbound communication and B2B outbound communication)?

A composite of four questions in the questionnaire is used to measure management perceptions. A mean score of 3.875 indicated that the managers of hotels agree that EC is complex. The other 50% of the managers surveyed did not perceive any complexity of EC. Table 5.27 below shows the descriptive data of management perceptions of EC.

Table 5.27: Descriptive statistics of complexity of EC

N	**Mean**	**S.D.**	**Skewness**	**Kurtosis**
330	3.875	.854	-1.203	2.705

Table 5.27 above indicates the four categories of EC adoption and the strength of the relationship between manager perceptions and the extent of EC adoption. Cronbach's alpha value for this set of questions is 0.856. This is very high, indicating consistency of responses. To examine the association between management perceptions on complexity and the extent of EC adoption, Pearson *r* correlation analysis is applied.

Table 5.28: Correlation analysis of complexity of EC

Dependent variable	Correlation	Sig.
B2C outbound communication	.122*	.027
B2C order taking	.295**	.000
B2B inbound communication	.338**	.000
B2B outbound communication	.195**	.000

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Results show that 'complexity' is positively correlated with each of the e-commerce variables. The categories of EC adoption showing the strength of the relationship between complexity and the dependent variables, from lowest to highest, are as follows:

B2C outbound communication

The statistical significance of complexity in B2B inbound communication is at the significant level of 0.05. Between the complexity and the extent of adoption of EC on B2B inbound communication, the correlation coefficient *r* is 0.122. The effect is positive; the strength of the relationship is small.

B2B outbound communication

The statistical significance of complexity in B2B inbound communication is at the significant level of 0.01. Between the complexity and the extent of adoption of EC on B2B inbound communication, the correlation coefficient *r* is 0.195. The effect is positive; the strength of the relationship is small.

B2C order taking

The statistical significance of complexity in B2C order taking is at the significant level of 0.01. Between the complexity and the extent of adoption of EC on B2C order taking, the correlation coefficient r is 0.295. The effect is positive; the strength of the relationship is medium.

B2B inbound communication

The statistical significance of complexity in B2B inbound communication is at the significant level of 0.01. Between the complexity and the extent of adoption of EC on B2B inbound communication, the correlation coefficient *r* is 0.338. The effect is positive; the strength of the relationship is medium.

Multiple regression analysis on complexity

Table 5.29: B2C outbound communication

Questions	**Coef.**	**Std. Err.**	**t**	**Pt**	**Remarks**
Q7.1:When a company lacks the appropriate tools	.607339	.5209998	1.17	0.245	Not sig.
Q7.2:When staff lacks expertise	-.2129859	.5103982	-0.42	0.677	Not sig.
Q7.3:When a company does not meet industry standards	-.4811713	.3752661	-1.28	0.201	Not sig.
Q7.4:When a company lacks funding	-.2284855	.3954644	-0.58	0.564	Not sig.

For a unit increase in B2C inbound communication, there is an increase in Q7.1 by 0.6 units, and a decrease in Q7.2 by 0.2 units, Q7.3 by 0.5 units and Q7.4 by 0.2 units.

Table 5.30: B2C Order taking

Questions	**Coef.**	**Std. Err.**	**t**	**Pt**	**Remarks**
Q7.1:When a company lacks the appropriate tools	.4995163	.4038899	1.24	0.218	Not sig.
Q7.2: When staff lacks expertise	.4979011	.3956713	1.26	0.210	Not sig.
Q7.3:When a company does not meet industry standards	.860077	.2909141	2.96	0.003	Sig.
Q7.4: When a company lacks funding	-.2164404	.3065722	-0.71	0.481	Not sig.

For a unit increase in B2C order taking, there is an increase in Q7.1 by 0.5 units, in Q7.2 by 0.5 units, Q7.3 by 0.9 units and a decrease in Q7.4 by 0.2 units.

Table 5.31: B2B inbound communication

Questions	Coef.	Std. Err.	t	Pt	Remarks
Q7.1:When a company lacks the appropriate tools	1.026757	.6474066	1.59	0.114	Not sig.
Q7.2: When staff lacks expertise	-1.105024	.6342328	-1.74	0.083	Not sig.
Q7.3:When a company does not meet industry standards	1.132448	.4663145	2.43	0.016	Sig.
Q7.4: When a company lacks funding	-1.179106	.4914133	-2.40	0.017	Sig.

For a unit increase in B2B inbound communication, there is an increase in Q7.1 by 1 unit, a decrease in Q7.2 by 1.1 units, an increase in Q7.3 by 1.1 units and a decrease in Q7.4 by 1.1 units.

Table 5.32: B2B outbound communication

Questions	Coef.	Std. Err.	t	Pt	Remarks
Q7.1:When a company lacks the appropriate tools	.4295785	.627597	0.68	0.494	Not sig.
Q7.2: When staff lacks expertise	.2668558	.6148262	0.43	0.665	Not sig.
Q7.3:When a company does not meet industry standards	.2559614	.452046	0.57	0.572	Not sig.
Q7.4: When a company lacks funding	-.2909182	.4763768	-0.61	0.542	Not sig.

For a unit increase in B2B outbound communication, there is an increase in Q7.1 by 0.4 units, in Q7.2 by 0.3 units, Q7.3 by 0.3 units and a decrease in Q7.4 by 0.3 units.

Table 5.33: Summary of questions on complexity in relation to the dependent variables

Questions	**B2C outbound**	**B2C order taking**	**B2B inbound**	**B2B outbound**
	P value	**P value**	**P value**	**P value**
Q7.3: When a company does not meet industry standards		0.003	0.016	
Q7.4:When a company lacks funding			0.017	

Discussion

There are four questions that are used to measure the relationship between complexity and the extent of EC adoption. Of the four items used to measure the relationship, two questions are significant and these are Q7.3 (EC is complex when a company lacks industry standards) and Q7.4 (EC is complex when a company lacks funding). The other two questions are not significant, and these are Q7.1 (EC is complex when the hotel lacks the appropriate tools) and Q7.2 (EC is complex when the staff lacks expertise).

When there are no industry standards (that is the basic requirements of a hotel room) (Q7.3), EC is complex for the customer in that the customer will see something advertised for one hotel but not for the others. If there are no industry standards then it will be significant for the consumer because the consumer does not know what is being offered. Different hotels are offering different products and the consumer is not sure what to expect. Of the respondents, 59.04% state that EC is complex when a company lacks industry standards. This scored a high percentage considering that 27.41% are uncertain, and the rest disagreed. Customers expect basic standards in any hotel and what may be considered basic in one hotel is not always considered basic in another. Some hotels have an Internet café, while others do not, but perhaps the latter offer a wireless Internet connection. Not all customers carry laptops and therefore the ones that do not carry a laptop will expect their hotel to have an Internet cafe.

Of the respondents, 76.5% agreed that EC adoption is complex when an organisation lacks funding (Q7.4), and 12% are uncertain. The rest did not agree that EC adoption is complex when the organisation lacks funding. This could be explained by the fact that when there is no funding, the organisation as a whole will be affected. A number of products will not be provided, employees will not be paid, and the hotel will not be able to afford the tools and expertise necessary for the business to prosper.

In response to the questions that yielded responses that are insignificant, it is expected that if a hotel has enough funding it can train its staff and they will then have the expertise that is needed by the hotels and the tools that it lacks. They can go ahead and offer the products and services that are not available to their customers. The two questions were mainly dependent upon Q7.4.

Business to business inbound communication had the highest number of significant items. It is complex for B2B inbound communication when there are no industry standards, as employees can never be sure of what is expected of them if there are not any standards to guide them and with which to compare themselves. They may be thinking that what they are doing is correct and yet in fact it is not correct, since there are no industry guidelines against which to measure their activities. This is when EC becomes complex for staff members.

EC is complex when there is a lack of funding for B2B inbounds communication; some businesses are unable to afford the costs involved in linking up with the databases of the hotels. These businesses have poor intranets within their organisation and most of the work has to be done manually, as such hotels cannot afford some of the IT tools that would make their work that much easier. Not having such IT tools negatively affects the business processes within these organisations. Without funding, hotels struggle to work with their suppliers; for example, placing orders manually is expensive and time-consuming.

B2C order taking also came up as significant when a company does not meet industry standards. When a company does not meet industry standards its customers are negatively affected because they will not know what to expect from different hotels. They will see one advert for one hotel and expect that those services are available at all other hotels. It is

not expected for all hotels to offer the same products, as prices do differ, but there are certain basic EC products that customers expect to receive at all hotels.

Table 5.34: Multiple regression analysis on the extent of EC adoption

Equation	**RMSE**	**R-sq**	**F**	**P**
B2C outbound communication	1.061	0.189	5.204	.000
B2C order taking	.823	.317	10.356	.000
B2B inbound communication	1.319	.169	4529	.000
B2B outbound communication	1.279	.286	8.951	.000

RMSE = Root Mean Square Error

With regard to the extent of the overall adoption prediction, all the dependent variables had a positive influence on the extent of adoption of EC on complexity prediction. The dependent variables significantly contributed to the model for predicting the extent of adoption of EC on complexity prediction.

The R^2 overall variation is explained by the independent variables in the model. In the case of B2C order taking, the value is .317, which means that 31.7% of the variance in the overall extent of adoption of EC on complexity prediction is explained by this model. The effect size of this model is large.

Conclusion

The results have shown that there is a correlation between the extent of e-commerce adoption and compatibility. The problem with complexity arises when there are no industry standards and hotels lack funding.

5.4 Organisational Context

Research Question 2: Is there a relationship between each of the organisational factors (organisational size, attitude of managers and technology knowledge) and the extent of electronic commerce?

The objective of this question is to find out if there is a relationship between the organisational factors and the extent of electronic commerce. To answer this research question, correlation analysis and multiple regression analysis is employed to test if there is a relationship between the factors. The organisational factors are: management perceptions on organisational size, the attitude of managers and technology knowledge. The best way to answer Research Question 2 is to break it down into the following three questions:

1: Is there a relationship between size and the extent of adoption of EC (B2C outbound communication, B2C order taking, B2B inbound communication and B2B outbound communication)?

2: Is there a relationship between information technology and the extent of adoption of EC (B2C outbound communication, B2C order taking, B2B inbound communication and B2B outbound communication)?

3: Is there a relationship between the manager's attitude and the extent of adoption of EC (B2C outbound communication, B2C order taking, B2B inbound communication and B2B outbound communication)?

5.4.1 Size

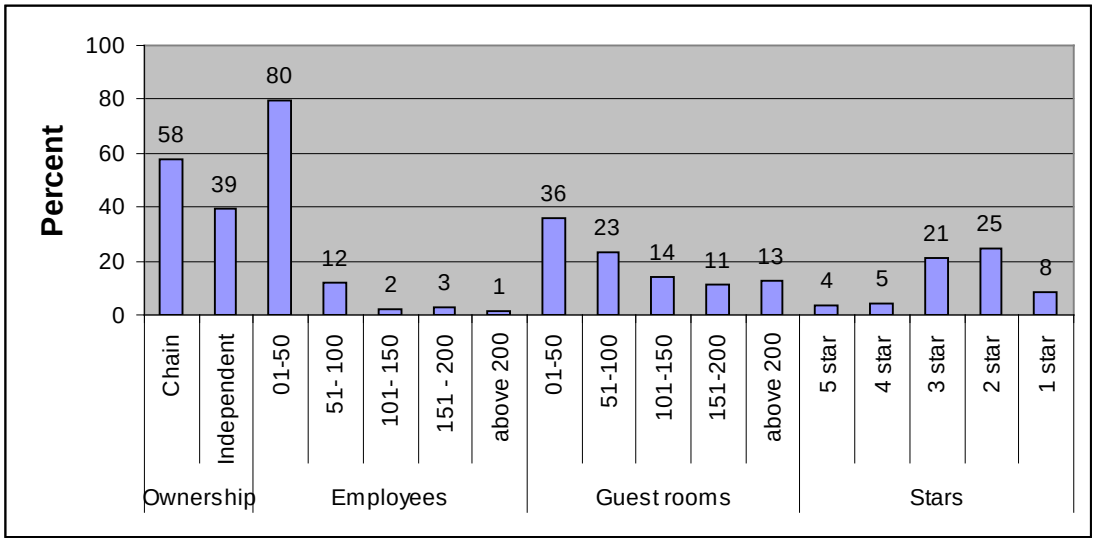
Research Question 2A: Is there a relationship between size and the extent of adoption of EC (B2C outbound communication, B2C order taking, B2B inbound communication and B2B outbound communication)?

A composite of four questions on the questionnaire is used to measure the relationship between size and the extent of EC adoption. The descriptive statistics show a mean score of 2.15413. Table 5.35 shows the descriptive data of size on EC adoption. The absolute value of kurtosis of organisational size is greater than 1.

Table 5.35: Descriptive statistics of managers' IT knowledge of EC

N	Mean	S.D.	Skewness	Kurtosis
	2.15413	0.958998	1.083338	3.564972

Frequency chart by hotel ownership, employment, guestrooms and size



* The totals do not add up to 100% because of missing values in each of the four categories

Figure 5.2: Hotel by ownership, employment, guestrooms and size

Section 2: Question 1 (Hotel Ownership)

Table 5.36: Comparison of hotel ownership

Dependent		N	Mean	SD	t	Sig.	Remarks
B2C outbound communication	Chain	167	58.4	29.1	2.6	0.010	Sig.
	Independent	107	49.5	27.1			
B2C order taking	Chain	182	71.9	17.6	3.4	0.000	Sig.
	Independent	117	63.9	21.9			
B2B inbound communication	Chain	125	50.8	14.5	-0.4	0.667	Not sig.
	Independent	48	52.1	18.5			
B2B outbound communication	Chain	118	77.8	28.1	3.5	0.000	Sig.
	Independent	65	61.5	31.3			

***N** does not add up 332 because of missing values.

Of the hotels surveyed, 58% are ‘chain hotels’ (i.e. they are owned by a group of companies) and 39% are independently owned hotels. As can be seen from Table 5.36 above, the only dependent variable that is not significant is B2B inbound communication. The other dependent variables are significant. Most of the chain hotels had a higher N value compared to the independent hotels. Figure 5.3 shows that there are more of the chain hotels than the independent hotels and most of the chain hotels are situated in the Western Cape.

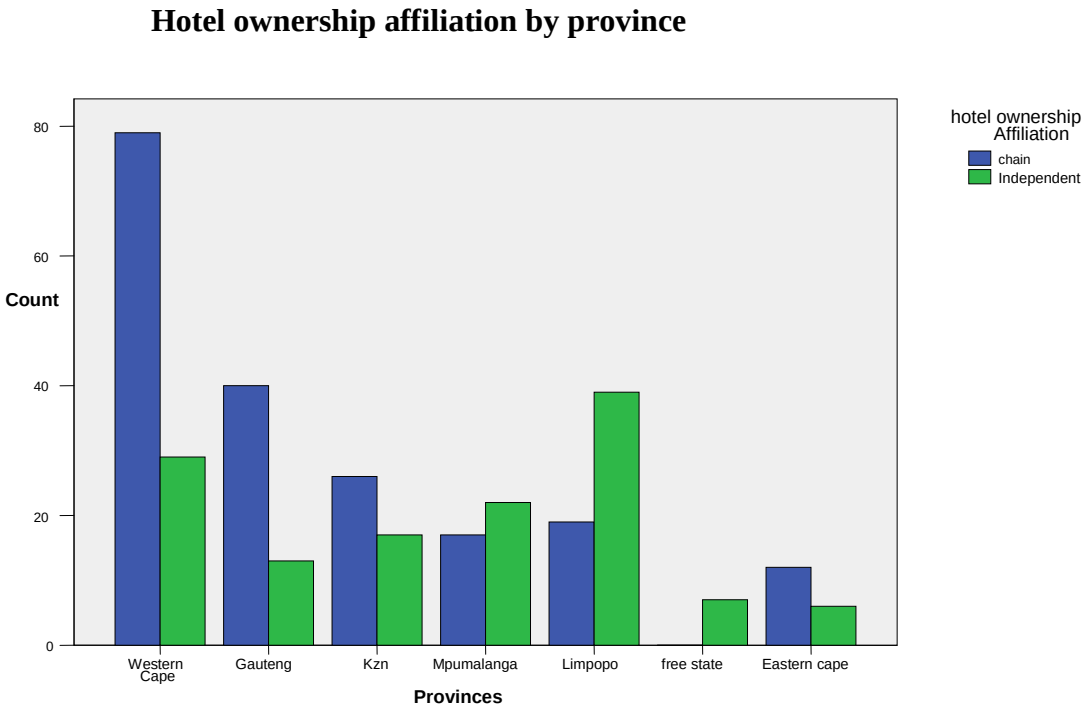


Figure 5.3: Hotel ownership affiliation by province

Section 2: Question 2 (Number of Employees)

Table 5.37: Frequency distribution table of the number of employees

Employees	Frequency	Percentage (%)
<50	264	81.7
51-100	40	12.4
101-150	6	1.9
151-200	9	2.8
200+	4	1.2
Total	323	100

*the frequency does not add to 332 because of missing values

The results indicated that 81.7% of the hotels have less than fifty employees. The likely explanation for this is that some of the hotels maintain fewer employees so as to enjoy the advantages of greater flexibility. It could also have to do with the number of rooms in the hotel: the fewer the rooms, the fewer staff members needed. Even though the hotels in Limpopo had guestrooms numbering between fifty-one and one hundred, they still employ less than fifty staff members.

A comparison of the number of employees in relation to the guestrooms

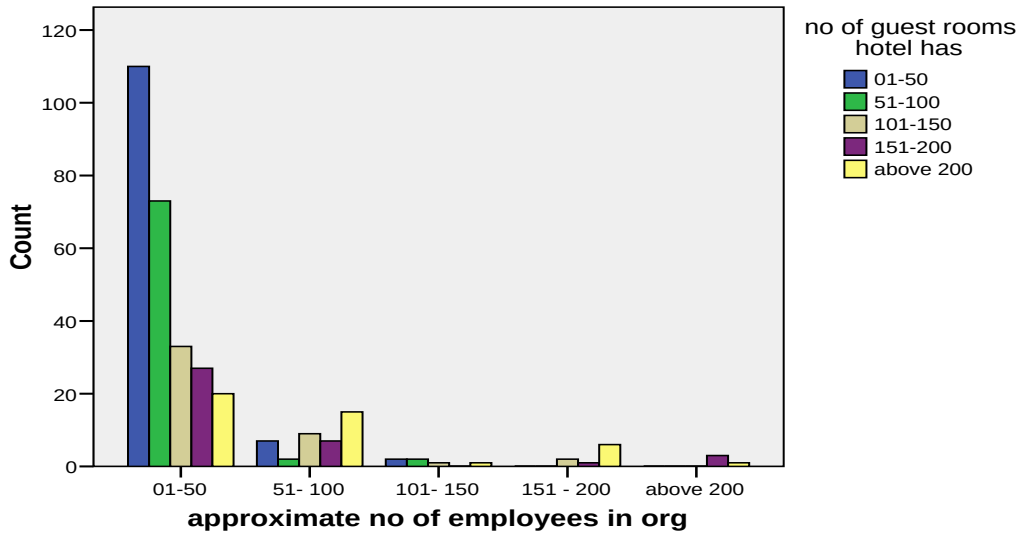


Figure 5.4: Comparison of the number of employees in relation to the guestrooms

Section 2: Question 3 (Hotel Ownership)

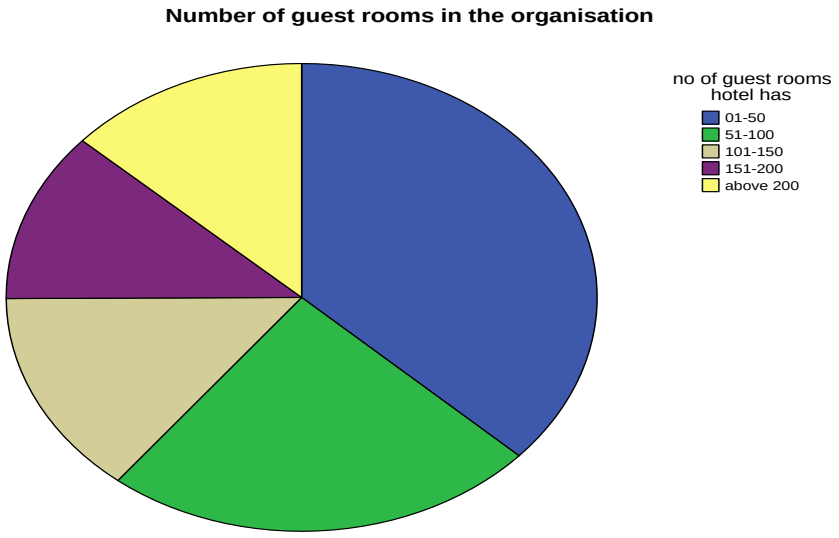


Figure 5.5: Number of guest rooms in organisation

Thirty-six percent of the hotels surveyed have less than fifty rooms, whilst thirteen percent have more than two hundred. This shows that most of the hotels sampled have fewer guestrooms to offer their customers. The advantage of being a small hotel is that it can concentrate on the quality of the services it offers. Hence, 96% of these small hotels reported that they have a website and offer an Internet connection. Twenty-four percent of the hotels have between 51 and 100 guestrooms. It is unsurprising, therefore, that eighty percent of these hotels employ a staff body numbering between one and fifty because these hotels have fewer rooms. Only one percent of the hotels surveyed have more than 200 employees and, in turn, only thirteen percent of all the hotels had over 200 guestrooms.

Section 2: Question 4 (Number of Stars the hotel has)

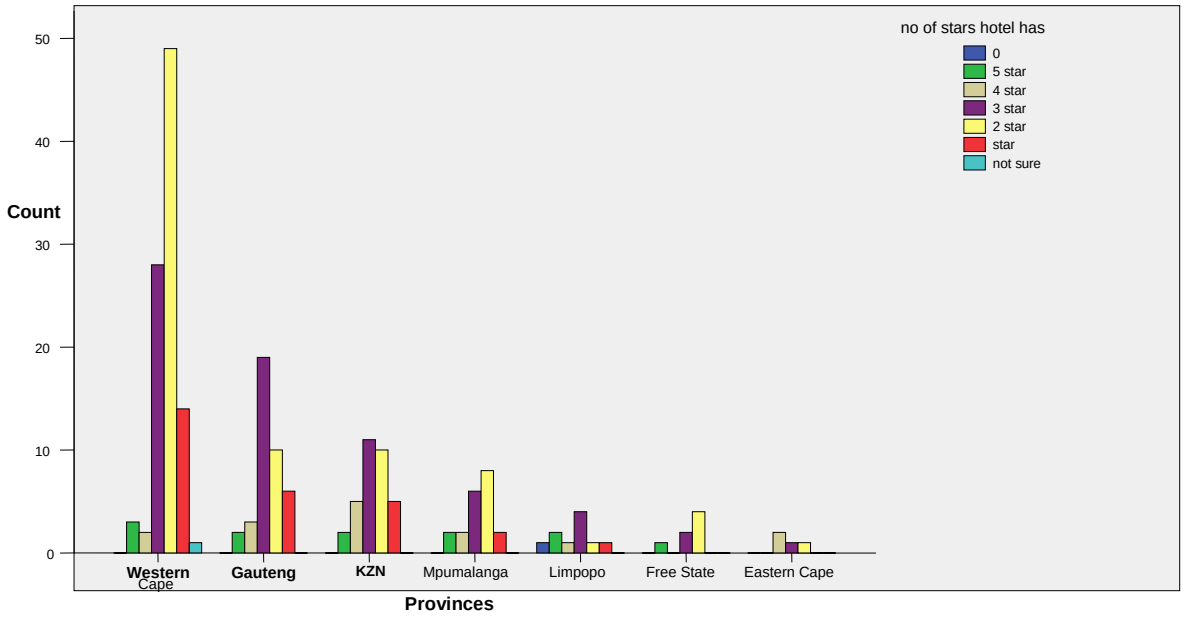


Figure 5.6: Number of stars hotel has

A total of 332 hotels were sampled, and only 63% of the respondents answered the question “How many stars does your hotel have?” Only five percent of the hotels surveyed are rated 5-star hotels. Those that are rated 2-star hotels had the highest respondents (39%) in terms of answering this specific question while 3-star hotels had a rating of thirty-four percent. It could be that a number of the hotels that have a 4-star and 5-star rating did not fill in this question. When asked why they did not answer this question, a number of hotels mentioned that they had just finished renovating their hotels for the 2010 FIFA World Cup and believed that their ratings were going to improve. They therefore preferred not to answer the question at that time, as they felt they might be underrating themselves. The Western Cape had the highest number of respondents and also the most star ratings in just about all of the star categories, except for the 4-star category; KwaZulu-Natal (KZN) had the highest rating in terms of the 4-star category. Gauteng, Limpopo and KZN had more 3-star hotels than hotels of any other rating.

Another possible explanation for there being more two-star ratings than any of the other ratings is that there are more small hotels than large ones. In addition, most of the hotels had less than 50 rooms, but they could well have been boutique hotels. The chain hotels

had more stars than the independent hotels. The only time when the two were equal was when they had been rated five-star hotels. The three-star rating for independent hotels is half that of the three-star rating for chain hotels. The hotels that are not sure of the ratings, or had a 0-star rating, are the independent hotels.

Table 5.38: Multiple regression analysis on size

Questions	**Coef.**	**Std. Err.**	**t**	**Pt**	**Remark**
Q1: Is there Internet?	-.4662267	.4178725	-1.12	0.267	Not sig.
Q2: Is there a Website?	-.6416779	.4555201	-1.41	0.162	Not sig.
S2Q1: Ownership affiliation	-.1162615	.2198787	-0.53	0.598	Not sig.
S2Q2: Number of employees	-.0940878	.1089165	-0.86	0.389	Not sig.
S2Q3: Guestrooms	.0321682	.0758974	0.42	0.672	Not sig.
S2Q4: Star rating	.0704947	.0897761	0.79	0.434	Not sig.

For a unit increase in B2C inbound communication, there is a decrease in Q.1 by 0.5 units and an increase in Q.2 by 0.6 units. There was a decrease in S2Q1 by 0.1 units, in S2Q2 by 0.1 units, and an increase S2Q3 by 0.03 units and in S2Q4 by 0.1 unit.

Table 5.39: B2C order taking

Questions	**Coef.**	**Std. Err.**	**t**	**Pt**	**Remark**
Q1: Is there Internet?	-.5709603	.3269138	-1.75	0.083	Not sig.
Q2: Is there a website?	.0396416	.3563667	0.11	0.912	Not sig.
S2Q1: Ownership affiliation	-.3164488	.1720175	-1.84	0.068	Not sig.
S2Q2: Number of employees	-.1730231	.0852086	-2.03	0.045	Sig.
S2Q3: Guestrooms	-.0466112	.0593768	-0.79	0.434	Not sig.
S2Q4: Star rating	.171918	.0702345	2.45	0.016	Sig.

For a unit increase in B2C order taking, there is a decrease in Q.1 by 0.5 units and an increase in Q.2 by 0.03 units. There was a decrease in S2Q1 by 0.3 units, in S2Q2 by 0.2 units, S2Q3 by 0.05 units and an increase in S2Q4 by 0.2 units.

Table 5.40: B2B inbound communication

Questions	Coef.	Std. Err.	t	Pt	Remarks
Q1: Is there Internet?	-.2529567	.561251	-0.45	0.653	Not sig.
Q2: Is there a website?	.0285452	.6118162	0.05	0.963	Not sig.
S2Q1: Ownership affiliation	-.0248515	.2953224	-0.08	0.933	Not sig.
S2Q2: Number of employees	-.1324078	.1462875	-0.91	0.367	Not sig.
S2Q3: Guestrooms	.0114536	.101939	0.11	0.911	Not sig.
S2Q4: Star rating	.0747897	.1205797	0.62	0.536	Not sig.

For a unit increase in B2B order taking, here is a decrease in Q.1 by 0.2 units and an increase in Q.2 by 0.03 units. There was a decrease in S2Q1 by 0.2 units, in S2Q2 by 0.1 units, and an increase S2Q3 by 0.01 units and in S2Q4 by 0.1 units.

Table 5.41: B2B outbound communication

Questions	Coef.	Std. Err.	t	Pt	Remarks
Q1: Is there Internet?	-.4108532	.52720225	-0.78	0.438	Not sig.
Q2: Is there a website?	-.7885652	.5745039	-1.37	0.172	Not sig.
S2Q1: Ownership affiliation	-.0798287	.2773119	-0.29	0.774	Not sig.
S2Q2: Number of employees	-.3127658	.137366	-2.28	0.025	Sig.
S2Q3: Guestrooms	-.0049268	.0957221	-0.05	0.959	Not sig.
S2Q4: Star rating	.1196146	.113226	1.06	0.293	Not sig.

For a unit increase in B2B order taking, there is a decrease in Q.1 by 0.4 units and in Q.2 by 0.8 units. There was also a decrease in S2Q1 by 0.1 units, in S2Q2 by 0.3 units, S2Q3 by 0.3 units and an increase in S2Q4 by 0.1 units.

Table 5.42: Summary of questions on size in relation to dependent variables

Questions	B2C outbound	B2C order taking	B2B inbound	B2B outbound
	P value	**P value**	**P value**	**P value**
S2Q2: Number of employees		0.045		0.025
S2Q4: Star rating		0.016		

Discussion

Organisational size had four questions that measured the relationship between size and the extent of EC adoption. Of the questions, the one that had the highest level of significance is S2q2 (i.e. “What is the approximate number of employees in your organisation?”) Fifty percent of the dependent variables had a significant correlation and the other 50% is insignificant. B2C order taking and B2B outbound had an effect within the hotels in that if too few employees are taking orders it has an effect on the hotel. If there are too few employees, the customers’ orders will not be effectively met. The same applies to employees in B2B outbound communication; for proper information to go to the other businesses hotels need their employees to respond quickly, otherwise hotels lose business.
B2C order taking is the only dependent variable that is significant in relation to S2q4 (“Star rating?”) The other dependent variables are insignificant. This shows that customers are more interested in the rating of a hotel and customers would like to know the type of hotel they are going to stay in. Star rating has no effect. This is because B2B inbound communication and B2B outbound communication deal with suppliers who are only interested in doing business with the hotels, compared with customers who want to know the type of hotel. This shows that customers are interested in the technology available in the hotel, as well as the rating of that particular hotel.

B2C order taking and B2B outbound communication had the highest number of respondents. B2B inbound communication and B2C outbound communication did not have one significant question that is relevant to this variable. This meant that there is no relationship between the number of employees, the hotel rating and the hotel’s affiliation in relation to B2B inbound communication.

Table 5.43: Multiple regression analysis on the extent of EC adoption

Equation	RMSE	R-sq	F	P
B2C outbound communication	.998	0.127	1.912	.056
B2C order taking	.781	.178	2.841	.004
B2B inbound communication	1.341	.059	.828	.592
B2B outbound communication	1.259	.269	4.836	.000

RMSE = Root Mean Square Error

The dependent variables significantly contributed to the model for predicting the extent of adoption of EC on size on the extent of the overall adoption prediction, all the dependent variables had a positive influence on the extent of adoption of EC on size prediction. B2B inbound communication did not significantly contribute to the model.

The R^2 overall variation is explained by the independent variables in the model. In the case of B2B outbound communication, the value is .27, which means that 27% of the variance in the overall extent of adoption of EC on size prediction is explained by this model. According to Leech *et al.*, (2005), the effect size of this model is large.

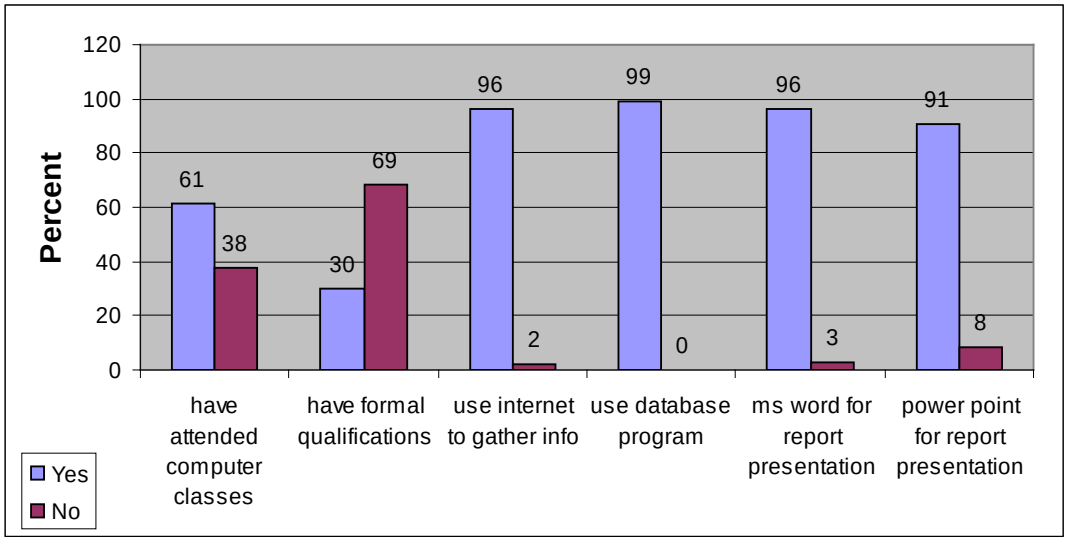
5.4.2 Manager's Technology Knowledge

Research Question 2B: Is there a relationship between information technology knowledge and the extent of adoption of EC (B2C outbound communication, B2C order taking, B2B inbound communication and B2B outbound communication)?

A composite of four questions on the questionnaire is used to measure the relationship between management perceptions and the extent of EC adoption. The descriptive statistics shows a mean score of 1.219. Table 5.44 shows the descriptive data of information technology knowledge on EC.

Table 5.44: Descriptive statistics of managers IT knowledge of EC

N	Mean	S.D.	Skewness	Kurtosis
326	1.219	0.335	4.623	35.946



*the percentages for each question do not add up to 100% because of missing values.

Figure 5.7: Graph showing a summary of Question 5 of the questionnaire

(i) Have attended computer classes

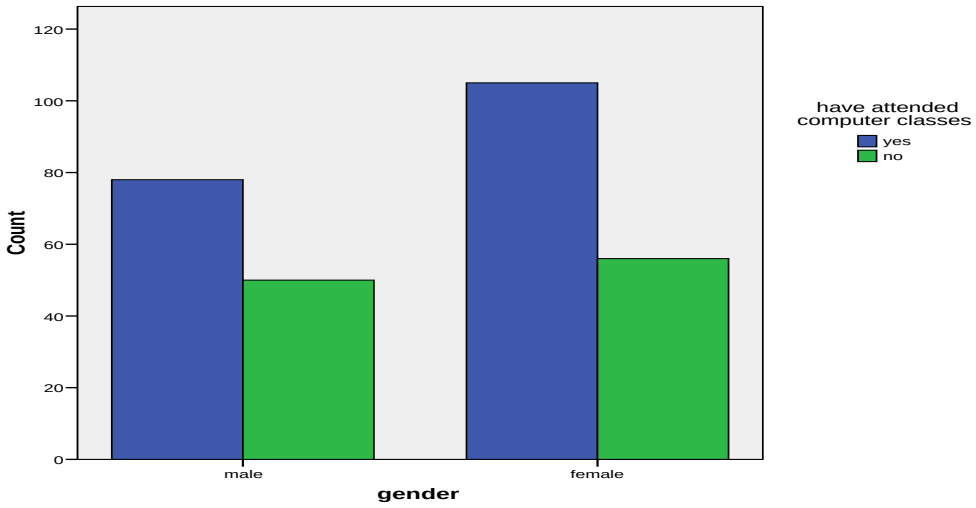


Figure 5.8: Have attended computer classes

Eighty-five percent of the respondents from Mpumalanga and Gauteng reported that they have attended computer classes. Seventy percent of the respondents from the Free State reported that they have attended computer classes, while seventy-two percent of the respondents from the Eastern Cape reported that they have not attended any computer classes. The Western Cape, which had the highest number of respondents, was evenly distributed between those who have attended computer classes and those who have not.

There are more respondents in KZN and Limpopo who attended computer classes than there were that did not.

(ii) Have formal computer qualifications

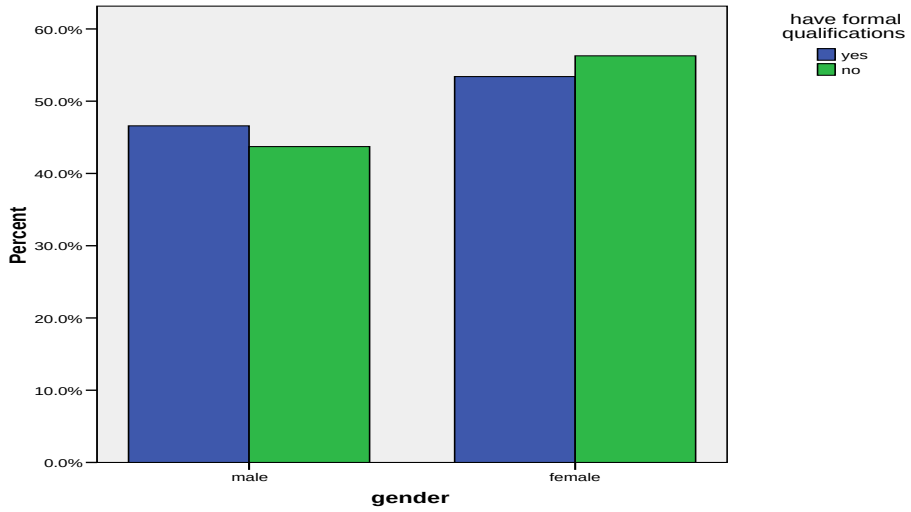


Figure 5.9: Have formal computer qualifications

Similar to those who have attended computer classes, more female than male managers reported that they have formal qualifications. More males attended computer classes than not, and there are more female managers without formal qualifications.

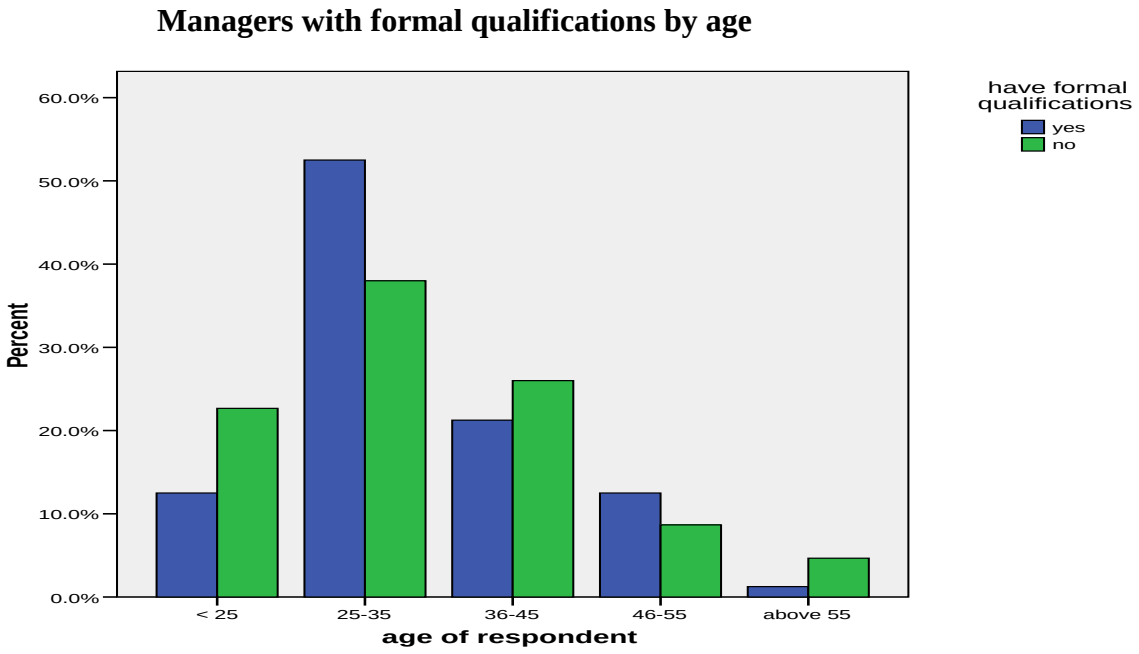


Figure 5.10: Have formal computer qualifications by age

The managers who had formal qualifications are within the age range of 25 to 35 years old. The highest number of respondents who do not have formal qualifications are in this age range. Very few above the age of 55 years have acquired any formal qualifications. The Limpopo province has the highest number of respondents with formal qualifications, followed by Gauteng and the Western Cape, where seventeen percent of the respondents are qualified, while in KZN had seventy-five percent of the respondents that are not qualified.

(iii) Use the Internet

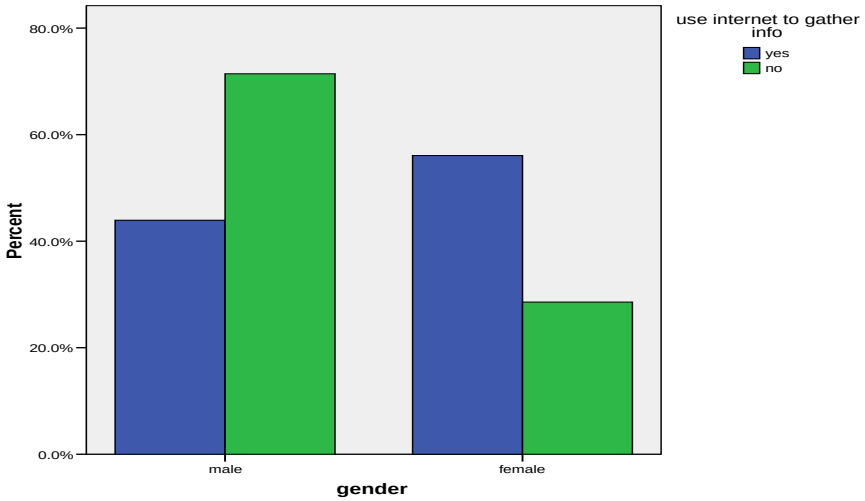


Figure 5.11: Use of internet by gender

There are more male than female managers who do not use the Internet to gather information for their jobs. Over seventy percent of male managers and about thirty percent of the female managers do not use the Internet to gather information. The bar chart above shows that, there are more females than males that use the Internet to gather information. This is not surprising because more female managers have attended computer classes than male managers. In addition, more female managers have formal qualifications than male managers. The fact that more females use technology than their male counterparts contradicts the study of Baker *et al.*, (2007), which states that more males than females use technology.

(iv) Use a database programme

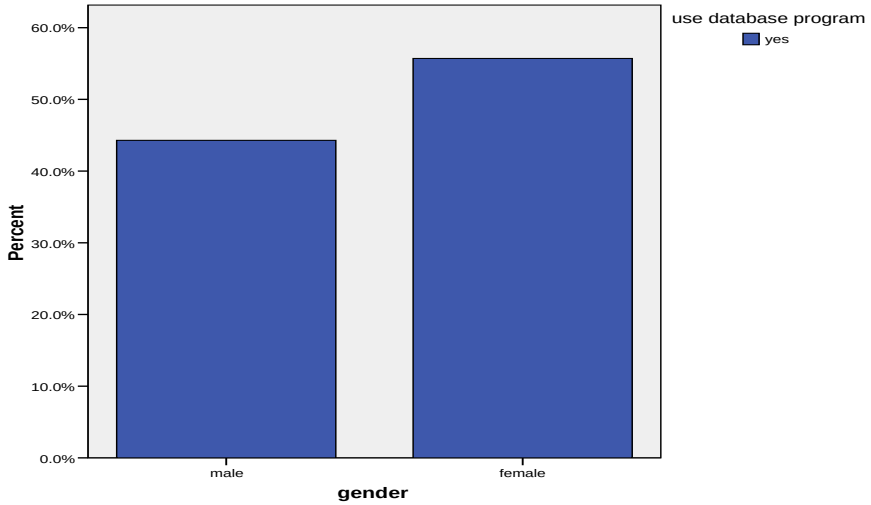


Figure 5.12: Use of database by gender

All the respondents reported that they use database programmes to capture information about their customers when making bookings or payments. A number of hotels reported they make follow-up calls to their customers and if they have to provide information to customers they obtain the information from the database. In the case of outbound communication the database can also be used to send orders to suppliers or to other people with whom the hotel works. Ninety-nine percent of the respondents reported that they use the database. It could be that female managers know how to use the database because of their computer training, and males use information they have learned on the job (as those who have not attended any computer classes have no formal training or qualifications).

(v) Use Microsoft Word (MS Word)

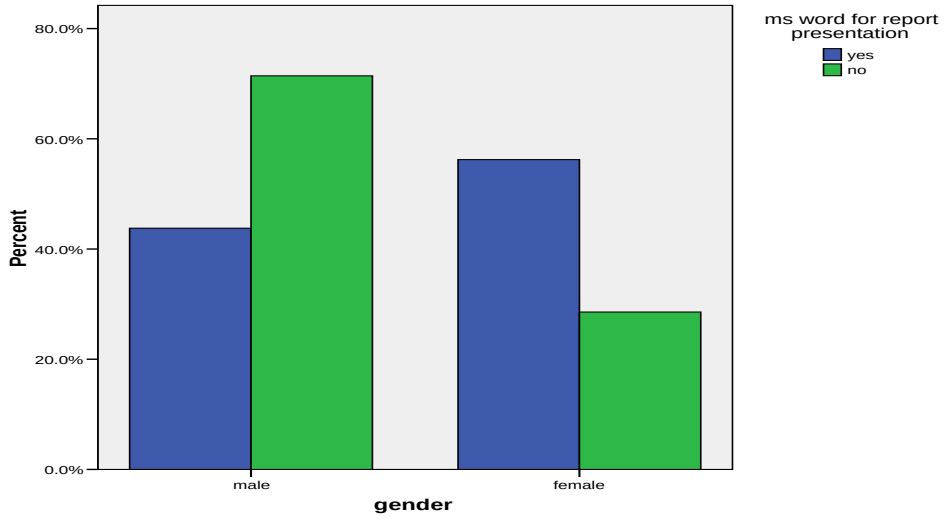


Figure 5.13: Use of Microsoft word by gender

More female managers reported they use MS Word than those who do not. On the other hand, more males do not use MS Word than do. More female than male managers reported that they use MS Word. It can now be seen where the female managers use their formal qualifications, for there are more female managers than male managers who attended classes and received formal qualifications. More managers use MS Word than those who do not use MS Word in all the variables, but B2C order taking is the only variable which has a statistical significance (i.e. it is at the significant level of .01).

(vi) Use Power Point

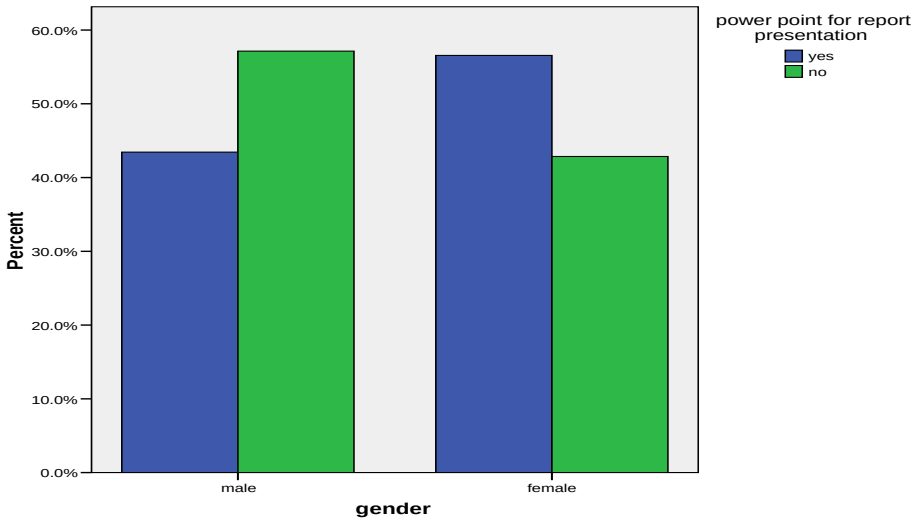


Figure 5.14: Use of PowerPoint by gender

Once again, more females than males use PowerPoint; it can therefore be seen that again more female managers have received computer training. A higher percentage of female managers use a database programme, MS Word and PowerPoint. Even though sixty-one percent of the respondents attended classes and thirty percent of the respondents have formal qualifications, it can be seen that most of the managers are using the computer skills that they acquired whilst on the job. Of all the software skills listed in the questionnaire, ninety percent of the managers reported that they are using the software, meaning that they are using EC tools.

Table 5.45: Multiple regression analysis on the extent of adoption of EC on information technology knowledge

Equation	**RMSE**	**R-sq**	**F**	**P**
B2C outbound communication	1.075	0.175	8.117	.000
B2C order taking	.917	.155	7.066	.000
B2B inbound communication	1.383	.090	3.816	.003
B2B outbound communication	1.279	.262	13.622	.000

RMSE = Root Mean Square Error

With regard to the extent of the overall adoption prediction, all the dependent variables have a positive influence on the extent of adoption of EC on information technology knowledge. The dependent variables significantly contributed to the model for predicting the extent of adoption of EC on information technology knowledge prediction.

The R^2 overall variation is explained by the independent variables in the model. In the case of B2B outbound communication, the value is .26, which means that 26% of the variance in the overall extent of adoption of EC on information technology knowledge prediction is explained by this model. The effect size of this model is large.

5.4.3 Manager's Attitudes

Research Question 2C: Is there a relationship between management attitudes and the extent of adoption of EC (B2C outbound communication, B2C order taking, B2B inbound communication and B2B outbound communication)?

A composite of twelve questions on the questionnaire is used to measure the relationship between management attitudes and the extent of EC adoption. The descriptive statistics shows a mean score of 3.005. Most of the managers have a positive attitude towards EC adoption. Table 5.46, below, indicates the descriptive data of management attitudes to EC.

Table 5.46: Descriptive statistics of management attitudes to EC

N	**Mean**	**S.D.**	**Skewness**	**Kurtosis**
317	3.005	1.088	1.0729	18.371

Table 5.47 below indicates the four categories of EC adoption and the strength of the relationship between the extent of adoption of EC on managers' attitudes. Cronbach's alpha value for this set of questions is 0.583. To examine the association between the managers' attitudes and the extent of EC adoption, Pearson *r* correlation analysis was applied. Only two of the dependent variables show a positive relationship with the extent of EC adoption.

Table 5.47: Correlation analysis of management attitudes to EC adoption

	Correlation	**Sig.**
B2C outbound communication	.205**	.000
B2C order taking	.072	.192
B2B inbound communication	-.014	.803
B2B outbound communication	.234**	.000

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

B2C outbound communication

The statistical significance of managers' attitudes in B2C outbound communication is at the significance level of 0.01. Between the managers' attitudes and the extent of adoption of EC on B2C outbound communication, the correlation coefficient *r* is 0.205. The effect is positive, with a medium effect size.

B2B outbound communication

The statistical significance of managers' attitudes in B2B outbound communication is at the significance level of 0.01. Between the managers' attitudes and the extent of adoption of EC on B2B outbound communication, the correlation coefficient *r* is 0.234. The effect is positive and the strength of the relationship is large.

Multiple regression analysis on management attitudes

Table 5.48: B2C outbound communication

Questions	**Coef.**	**Std. Err.**	**t**	**Pt**	**Remark**
S2q6.1: Seek new ways of doing things	-.3334709	.2767809	-1.20	0.230	Not sig.
S2q6.2: Involved in adoption	.6289926	.3226676	1.95	0.053	Sig.
S2q6.3: Involved in implementation	-.22378	.3332738	-0.67	0.503	Not sig.
S2q6.4: Take lead in technology	-.1994326	.2520602	-0.79	0.430	Not sig.
S2q6.5: Cost of implementation is high	.0884451	.1957219	0.45	0.652	Not sig.
S2q6.6: Skeptical of new ideas	.1050684	.1811197	0.58	0.563	Not sig.
S2q6.7: Receptive to new ideas	.4160148	.2160668	1.93	0.056	Not sig.
S2q6.8: Old ways are better	-.1497588	.1995853	-0.75	0.454	Not sig.
S2q6.9: Reluctant to adopt new ways	-.0898603	.2067615	-0.43	0.664	Not sig.
S2q6.10: Training in IT is costly	.0620059	.2208534	0.28	0.779	Not sig.
S2q6.11: Maintenance of IT is costly	-.0963216	.2215647	-0.43	0.664	Not sig.
S2q6.12: Must come up with original ideas	-.1153674	.2042085	-0.56	0.573	Not sig.

For a unit increase in B2C outbound communication, there is a decrease in the following questions: in S2q6.1 by 0.3 units, S2q6.3 by 0.2 units, S2q6.3 by 0.2 units, S2q6.4 by 0.2 units, S2q6.8 by 0.1 units, S2q6.9 by 0.1 units, S2q6.11 by 0.1 units and S2q6.12 by 0.1 units.

For a unit increase in B2C outbound communication, there is an increase in the following questions;: in S2q6.2 by 0.6 units, S2q6.5 by 0.1 units, S2q6.6 by 0.1 units, S2q6.7 by 0.4 units and S2q6.10 by 0.1 units.

Table 5.49: B2C order taking

Questions	**Coef.**	**Std. Err.**	**t**	**Pt**	**Remark**
S2q6.1: Seek new ways of doing things	.3547549	.2249123	1.58	0.116	Not sig.
S2q6.2: Involved in adoption	.2368585	.2621999	0.90	0.368	Not sig.
S2q6.3: Involved in implementation	-.1147646	.2708184	-0.42	0.672	Not sig.
S2q6.4: Take lead in technology	-.2270562	.2048242	-1.11	0.269	Not sig.
S2q6.5: Cost of implementation is high	.2289265	.1590437	1.44	0.152	Not sig.
S2q6.6: Skeptical of new ideas	-.0334944	.147178	-0.23	0.820	Not sig.
S2q6.7: Receptive to new ideas	.4573873	.175576	2.61	0.010	Sig.
S2q6.8: Old ways are better	.0023604	.1621831	0.01	0.988	Not sig.
S2q6.9: Wary of new ways	.2315497	.1680145	1.38	0.170	Not sig.
S2q6.10: Training in IT is costly	-.2470469	.1794655	-1.38	0.170	Not sig.
S2q6.11: Maintenance of IT is costly	.0651311	.1800436	0.36	0.718	Not sig.
S2q6.12: Must come up with original ideas	-.2096726	.1659399	-1.26	0.208	Not sig.

For a unit increase in outbound communication, there is a decrease in the following questions: in S2q6.3 by 0.1 units, S2q6.4 by 0.2 units, S2q6.6 by 0.03 units, S2q6.10 by 0.2 units and S2q6.12 by 0.2 units.

For a unit increase in outbound communication, there is an increase in the following questions: in S2q6.1 by 0.3 units, S2q6.2 by 2 units, S2q6.5 by 0.2 units, S2q6.7 by 0.5 units, S2q6.8 by 0.002 units, S2q6.9 by 0.2 units and S2q6.11 by 0.1 units.

Table 5.50: B2B inbound communication

Questions	Coef.	Std. Err.	t	Pt	Remark
S2q6.1: Seek new ways of doing things	-.0381185	.3274142	-0.12	0.907	Not sig.
S2q6.2: Involved in adoption	.2909271	.3816953	0.76	0.447	Not sig.
S2q6.3: Involved in implementation	.3910862	.3942417	0.99	0.323	Not sig.
S2q6.4: Take lead in technology	-.0657048	.2981712	-0.22	0.826	Not sig.
S2q6.5: Cost of implementation is high	-.21054	.2315265	-0.91	0.364	Not sig.
S2q6.6: Skeptical of new ideas	-.0680313	.2142531	-0.32	0.751	Not sig.
S2q6.7: Receptive to new ideas	.38595	.2555933	1.51	0.133	Not sig.
S2q6.8: Old ways are better	-.2192067	.2360967	-0.93	0.354	Not sig.
S2q6.9: Wary of new ways	.0130196	.2445857	0.05	0.958	Not sig.
S2q6.10: Training in IT is costly	.1827881	.2612555	0.70	0.485	Not sig.
S2q6.11: Maintenance of IT is costly	-.0921231	.262097	-0.35	0.726	Not sig.
S2q6.12: Must come up with original ideas	-1.048142	.2415657	-4.34	0.000	Sig.

For a unit increase in outbound communication, there is an increase in the following questions: in S2q6.2 by 0.2 units, S2q6.3 by 0.3 units, S2q6.7 by 0.3 units, and S2q6.9 by 0.01 units and S2q6.10 by 0.2 units.

For a unit decrease in outbound communication, there is a decrease in the following questions: in S2q6.1 by 0.03 units, S2q6.4 by 0.06 units, S2q6.5 by 0.2 units, S2q6.6 by 0.06 units, S2q6.8 by 0.2 units, S2q6.11 by 0.09 units and S2q6.12 by 1.1 units.

Table 5.51: B2B outbound communication

Questions	Coef.	Std. Err.	t	Pt	Remark
S2q6.1: Seek new ways of doing things	.5181841	.33487147	1.55	0.123	Not sig.
S2q6.2: Involved in adoption	.6361794	.3902062	1.63	0.105	Not sig.
S2q6.3: Involved in implementation	-.5221959	.4030323	-1.30	0.197	Not sig.
S2q6.4: Take lead in technology	-.3159379	.3048197	-1.04	0.301	Not sig.
S2q6.5: Cost of implementation is high	.1469634	.236689	0.62	0.535	Not sig.
S2q6.6: Skeptical of new ideas	.0298687	.2190304	0.14	0.892	Not sig.
S2q6.7: Receptive to new ideas	.5633558	.2612924	2.16	0.032	Sig.
S2q6.8: Old ways are better	-.0198343	.2413611	-0.08	0.935	Not sig.
S2q6.9: Wary of new ways	.023775	.2500394	0.10	0.924	Not sig.
S2q6.10: Training in IT is costly	.1947207	.2670809	0.73	0.467	Not sig.
S2q6.11: Maintenance of IT is costly	.0123847	.2679411	0.05	0.963	Not sig.
S2q6.12: Must come up with original ideas	-.0951224	.246952	-0.39	0.701	Not sig.

For a unit increase in outbound communication, there is an increase in the following questions: in S2q6.1 by 0.5 units, S2q6.2 by 0.6 units, S2q6.5 by 0.1 units, S2q6.6 by 0.03 units, S2q6.7 by 0.5 units, S2q6.9 by 0.02 units, S2q6.10 by 0.2 units and S2q6.11 by 0.3 units.

For a unit increase in outbound communication, there is a decrease in the following questions: in S2q6.3 by 0.5 units, S2q6.4 by .3 units and S2q6.12 by 0.1 units.

Table 5.52: Summary of questions on management attitudes in relation to the dependent variable

Questions	B2C outbound	B2C order taking	B2B inbound	B2B outbound
S2q6.2: Involved in adoption	0.053			
S2q6.7: Receptive to new ideas		0.032		0.032
S2q6.12: Must come up with original ideas			0.000	

Discussion

Twelve questions are used in this independent variable to measure the relationship between managers' attitudes and the extent of EC adoption. Of the twelve questions that are used for this variable, S2q6.2 (involved in adoption), S2q6.7 (receptive to new ideas) and S2q6.12 (must come up with original ideas) are the ones that are significant.

The question that is significant in a number of the dependent variables is S2q6.7 ("I am receptive to new ideas"), which is important in the hotel industry. A manager has to keep up with what is happening and be ready for change; a manager thus has to be receptive to new ideas otherwise he/she will be left behind. Zhu *et al.,* (2003) argue that the hotel industry has not been improving in technology because the managers are not receptive to new ideas. The manager has to be receptive to what the customer wants, otherwise he/she might be providing products or services with which the customer is unhappy. The manager has to find out what it is that the customers want and then provide those services and products (Kotler and Kevin, 2010). It is also important for managers to find out what is happening in the industry and provide those services. If a manager does not do this, the hotel will be left behind.

A hotel manager has to be receptive to new ideas coming from the hotel's suppliers to create a better understanding between them. They can learn from suppliers what other hotels are offering, as suppliers work with more than one hotel. A manager can obtain information on the trends of EC within the hotel business.

It is important that managers be involved in the adoption (S2q6.2) of B2C outbound communication. If they are not involved, they will be left out and will not understand what is happening (Stair *et al.,* 2008). Managers may then resist certain technologies because they have a limited understanding of what the new technologies involve. Managers have to be involved in what is happening in technology, otherwise the hotel's consumers will be asking for things of which the manager is unaware, or managers will fail to respond in time because they are unsure of what is being asked of them. In a study conducted by Hipkin & Bennet (2003), hotel managers mentioned they realized they have to know what is happening – they cannot just adopt or fix something if they do not know how it works, why that machine/software is required, how important it is, and what really happens when

the technology breaks down. In the same study, one manager actually stated that managers should not be taught just to adopt new technologies, but should also be taught how to maintain them, as this would improve the performance of the technology involved.

S2q6.12 speaks about how hotel managers must come up with their own original ideas as to what IT is needed by their hotels; they must not just follow the example of others. If a manager has to develop IT for the hotel, then that manager has to decide for what is needed. In this way the manager is being innovative so as to meet the demands of the customers of the hotel. A manager who is not innovative will always be falling behind and by the time he/she finally adopts new technologies, other hotels will already have started using the technology and may have won over the customers of the former hotel. A manager should know the hotel industry and try to lead or be innovative with new technology that will make the life of the hotel staff and its clients easier and more pleasant.

All the variables had a question that related to each variable except for B2C order taking and B2B outbound, which had a question that was common to them. The reason for this is explained above.

In the case of B2C order taking, the manager has to be receptive because he/she is dealing directly with customers who will express what they want. The manager has to be receptive to ideas from the hotel's customers if the manager wants to market the products of the hotel (Cash *et al*., 2008).

B2B inbound managers (as well as their employees) have to be innovative in the workplace. They need to come up with their own programme if they want their organisation to succeed. Employees want to do their work in the easiest possible manner.

Table 5.53: Multiple regression analysis on the extent of EC adoption

	RMSE	**R-sq**	**F**	**P**
B2C outbound communication	1.045	0.192	2.535	.001
B2C order taking	.849	.254	3.652	.000
B2B inbound communication	1.236	.304	4.677	.000
B2B outbound communication	1.264	.314	4.909	.000

RMSE = Root Mean Square Error

With reference to the extent of the overall adoption prediction, all the dependent variables have a positive influence on the extent of adoption of EC on management attitudes prediction. The dependent variables significantly contributed to the model for predicting the extent of adoption of EC on management attitudes prediction.

The R^2 overall variation is explained by the independent variables in the model. In the case of B2B outbound communication, the value is .31, which means that 31% of the variance in the overall extent of adoption of EC on management attitudes prediction was explained by this model. According to Leech *et al.*, (2005), the effect size of this model is large.

Conclusion

There is no correlation between B2C order taking, B2C inbound communication and the manager's attitude in the hotel industry. There is a positive correlation with B2C outbound, B2B outbound and the manager's attitude. In the multiple regression analysis, however, *p* was positive in all the dependent variables.

From the questions asked, it came out clearly that managers have to be involved in the adoption of EC to know what is happening in the industry. The manager has to be receptive to new ideas, especially those that come from the customers, be innovative and forward thinking. In this way hotel managers will meet the needs of the client.

5.5 Environmental Factors

Research Question 3: Is there a relationship between each of the environmental factors (information intensity and competition) and the extent of electronic commerce?

The objective of this question is to find out if there is any relationship at all between the environmental factors and the extent of electronic commerce. To answer this research question, correlation analysis and multiple regression analysis are employed to see if there is a relationship between these factors. The environmental factors are: the manager's perception of information intensity and competition. The best way to answer Research Question 3 is to break it down into the following two questions:

1: Is there a relationship between information intensity and the extent of adoption of EC (B2C outbound communication, B2C order taking, B2B inbound communication and B2B outbound communication)?

2: Is there a relationship between competition and the extent of adoption of EC (B2C outbound communication, B2C order taking, B2B inbound communication and B2B outbound communication)?

5.5.1 Information Intensity

Research Question 3A: Is there a relationship between information intensity and the extent of adoption of EC (B2C outbound communication, B2C order taking, B2B inbound communication and B2B outbound communication)?

A composite of four questions on the questionnaire is used to measure the relationship between management perceptions. A mean score of 4.207 indicates that the hotel managers surveyed are in agreement that they are working in an industry of information intensive industry. This tells us that hotels need up-to-date information in order to survive in the hotel industry. Table 5.54 below shows the descriptive data on information intensity.

Table 5.54: Descriptive statistics of information intensity of EC

N	Mean	S.D.	Skewness	Kurtosis
329	4.207	0.757	-1.128	2.312

Table 5.55, below, indicates the four categories of EC adoption and the strength of the relationship between information intensity and the extent of EC adoption. To examine the association between information intensity and the extent of EC adoption, Spearman's б correlation analysis is employed. All the categories show a positive relationship with the extent of EC adoption, with a medium to small effect size. Hence, all of the four categories of EC adoption are statistically significant. The four categories of EC adoption showing the strength of the relationship between information intensity and the extent of adoption of EC are shown below.

Table 5.55: Correlation analysis of information intensity of EC

	Correlation	Sig.	Remark
B2C outbound communication	.465**	.000	Medium
B2C order taking	.358**	.000	Medium
B2B inbound communication	.467**	.000	Medium
B2B outbound communication	.503**	.000	Large

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

B2C outbound communication

The statistical significance of information intensity in B2C outbound communication is at the significance level of 0.01. Between information intensity and the extent of adoption of EC on B2C outbound communication, the correlation coefficient *r* is 0.465. The effect is positive and the strength of the relationship is medium.

B2C order taking

The statistical significance of information intensity in B2C order taking is at the significance level of 0.01. Between the information intensity and the extent of adoption of EC on B2C order taking, the correlation coefficient *r* is 0.358. The effect is positive and the strength of the relationship is medium.

B2B inbound communication

The statistical significance of information intensity in B2C inbound communication is at the significance level of 0.01. Between the information intensity and the extent of adoption of EC on B2C inbound communication, the correlation coefficient *r* is 0.467. The effect is positive and the strength of the relationship is medium.

B2B outbound communication

The statistical significance of information intensity in B2B outbound communication is at the significance level of 0.01. Between the information intensity and the extent of adoption of EC on B2B outbound communication, the correlation coefficient *r* is 0.503. The effect is positive, with a large effect size.

Multiple regression analysis on information intensity

Table 5.56: B2C inbound communication

Question	**Coef.**	**Std. Err.**	**t**	**Pt**	**Remark**
S3q1.1: Information is suitable	.0542562	.4438579	0.12	0.903	Not sig.
S3q1.2: Easy access of information	-.0548852	.6805254	-0.08	0.936	Not sig.
S3q1.3: Products and services are easy to obtain	1.448112	.7183654	2.02	0.045	Sig.
S3q1.4:Dependent upon up-to-date information	.0048427	.4488374	0.01	0.991	Not sig.

For a unit increase in B2C inbound communication, there is an increase in S3q1.1 by 0.1 units, a decrease in S3q1.2 by 0.1 units, an increase S3q1.3 by 1.4 units and an increase in S3q1.4 by 0.00 units.

Table 5.57: B2C order taking

	Coef.	**Std. Err.**	**t**	**Pt**	**Remarks**
S3q1.1: Information is suitable	.3757246	.3807856	0.99	0.325	Not sig.
S3q1.2: Easy access of information	-.6035926	.5838227	-1.03	0.302	Not sig.
S3q1.3: Products and services are easy to obtain	.33397	.6162855	0.54	0.588	Not sig.
S3q1.4: Dependent upon up-to-date information	.6016696	.3850575	1.56	0.120	Not sig.

For a unit increase in B2C order taking, there is an increase in S3q1.1 by 0.4 units, a decrease in S3q1.2 by 0.6 units, an increase S3q1.3 by 0.3 units and an increase in S3q1.4 by 0.6 units.

Table 5.58: B2B inbound communication

	Coef.	**Std. Err.**	**t**	**Pt**	**Remarks**
S3q1.1: Information is suitable	1.104556	.5896706	1.87	0.063	Not sig.
S3q1.2: Easy access of information	-.2410032	.9040864	-0.27	0.790	Not sig.
S3q1.3: Products and services are easy to obtain	-.213471	.9543572	-0.22	0.823	Not sig.
S3q1.4: Dependent upon up-to-date information	.2416817	.596286	0.41	0.686	Not sig.

For a unit increase in B2B inbound communication, there is an increase in S3q1.1 by 1.1 units, a decrease in S3q1.2 by 0.2 units, in S3q1.3 by 0.2 units and an increase in S3q1.4 by 0.2 units.

Table 5.59: B2B outbound communication

Questions	Coef.	Std. Err.	t	Pt	Remarks
S3q1.1: Information is suitable	.4747978	.5509395	0.86	0.390	Not sig.
S3q1.2: Easy access of information	.7921044	.8447037	0.94	0.350	Not sig.
S3q1.3: Products and services are easy to obtain	.5332273	.8916726	0.60	0.551	Not sig.
S3q1.4: Dependent upon up-to-date information	-.2438806	.5571204	-0.44	0.662	Not sig.

For a unit increase in B2C inbound communication, there is an increase in S3q1.1 by 0.5 units, in S3q1.2 by 0.8 units, in S3q1.3 by 0.5 units and a decrease in S3q1.4 by 0.2 units.

Table 5.60: Summary of questions on information intensity in relation to the dependent variables

	B2C outbound	B2C order taking	B2B inbound	B2B outbound
Question	**P value**	**P value**	**P value**	**P value**
S3q1.3: Products and services are easy to obtain	0.045			

Of the four questions that are used to measure information intensity, only one question (i.e. S3q1.3: products and services are easy to obtain) in B2C outbound communication is significant. The results from the questions indicate that information intensity had one question that has a significant association with EC adoption. The questions on their own do not show any significance but, once grouped together, they are significant, as is indicated by Table 5.61 below.

At least, products and services are easy to obtain for B2C outbound communication. It is a problem for hotels if their services and products are inaccessible to their customers.

Table 5.61: Multiple regression analysis on the extent of EC adoption

Equation	RMSE	R-sq	F	P
B2C outbound communication	1.019	.221	6.296	.000
B2C order taking	.874	.204	5.681	.000
B2B inbound communication	1.354	.124	3.137	.002
B2B outbound communication	1.265	.296	9.333	.000

RMSE = Root Mean Square Error

Regarding the extent of the overall adoption prediction, all the dependent variables have a positive influence on the extent of adoption of EC on information intensity. The dependent variables significantly contributed to the model for predicting the extent of adoption of EC on information intensity prediction.

The R^2 overall variation is explained by the independent variables in the model. In the case of B2B outbound communication, the value is .296, which means that 29.6% of the variance in the overall extent of adoption of EC on information intensity prediction is explained by this model. According to Leech *et al.,* (2005), the effect size of this model is large.

Table 5.62: Association between the hotel having its own website and information intensity

	Questions	Chi	Fisher's	Remark
1	Information about our product and services are suitable for EC	30.27	.000	Sig.
2	EC is important for the hotel to quickly access information whenever needed	24.80	.002	Sig.
3	Products and services are easy to obtain through EC	28.82	.001	Sig.
4	Hotel is dependent upon up-to-date information	11.14	.010	Sig.

There is a strong association between a hotel having its own website and information intensity. All the questions have proved significant. In relation to an organisation having a

website, the information has to be suitable for EC if the hotels are to acquire customers. Otherwise, customers will not know anything about the hotel if the hotel's products are not put on the website. Customers want to know about a hotel's rating, the technology that is available and any other facilities that are available. Hotels have to advertise on their website for potential customers to know about their prices.

There has to be a relationship between the website and information intensity in relation to the hotel being able to access information quickly. The hotel has to access information quickly so that its employees can know about any new technological developments as well as any other developments needed or wanted by customers. Hotels need to know how many customers are coming and whether or not the hotel will be able to accommodate them all. Confirmation also has to be made quickly so that customers are not inconvenienced. It also emerged in the study that the hotel industry is a very competitive business; if hotels do not access information on time and customers are delayed, the customers may well take their patronage to another hotel.

Hotels are dependent upon up-to-date information, customers need up-to-date information as well and therefore the website must have the necessary information. If hotels advertise incorrect information, customers will switch to other hotels. Hotels have to be aware of the industry standards so that they can keep up with them and provide customers with up-to-date information (Kotler & Kevin, 2010).

Table 5.63: Association between a hotel having its own Internet connection and information intensity

	Questions	**Chi**	**Fisher's**	**Remark**
1	Information about our product and services is suitable for EC	21.56	.001	Sig.
2	EC is important for the hotel to quickly access information whenever needed	6.83	.056	Not sig.
3	Products and services can be easily obtained through EC	10.35	.017	Sig.
4	Hotel is dependent upon up-to-date information	2.95	.113	Not sig.

Fifty percent of the questions show a relationship between a hotel having an Internet connection and not having Internet. The products and services have to be listed on the Internet for customers to be aware of what a hotel is offering. As has been stated by Olsen & Connolly (2000), when travelers who are not loyal to a hotel are unhappy, it is easy for them to switch to another hotel. The same applies to those hotels that cannot show their customers the services that they offer (Murphy & Tan, 2003; Teo & Pian, 2003).

Conclusion

There is a positive correlation between information intensity and the extent of EC adoption. In the case of multiple regressions, all the variables are positive, when looking at the association between the hotels having a website and not having a website. When looking at the association between a hotel having its own Internet connection and the other variables, not all the variables are positive. Among the questions asked, only one of them proved significant, namely that products and services can be easily obtained through EC.

5.5.2 Competition

Research Question 3B: Is there a relationship between competition and the extent of adoption of EC (B2C outbound communication, B2C order taking, B2B inbound communication and B2B outbound communication)?

A composite of four questions on the questionnaire is used to measure the relationship between competition and the extent of EC adoption. A mean score of 3.293 was reached, which indicates that the managers of hotels agree that the industry in which they are working is a highly competitive one. This indicates that hotel managers are engaged in intense professional rivalry.

Table 5.64: Descriptive statistics of competition

N	Mean	S.D.	Skewness	Kurtosis
327	3.293	1.217	-0.409	-0.844

Table 5.64 below shows the four categories of EC adoption and the strength of the relationship between competition and the extent of EC adoption. To examine the association between competition and the extent of EC adoption, Pearson's *r* correlation analysis is employed. All the categories show a positive relationship, with the extent of adoption of EC having a medium effect size. All four categories of EC adoption are therefore statistically significant. The four categories of EC adoption, showing the strength of the relationship between competition and the extent of adoption of EC are discussed below.

Table 5.65: Correlation analysis of competition of EC

	Correlation	**Sig.**
B2C outbound communication	.538**	.000
B2C order taking	.421**	.000
B2B inbound communication	.421**	.000
B2B outbound communication	.583**	.000

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

B2C outbound communication

The statistical significance of competition in B2C communication is at the significant level of 0.01. Between the competition and the extent of adoption of EC on B2C communication, the correlation coefficient *r* is 0.538. The effect is positive, with a strong relationship.

B2C order taking

The statistical significance of competition in B2C communication is at the significant level of 0.01. Between the competition and the extent of adoption of EC on B2C communication, the correlation coefficient *r* is 0.421. The effect is positive; the strength of the relationship is medium.

B2B inbound communication

The statistical significance of competition in B2C communication is at the significant level of 0.01. Between the competition and the extent of adoption of EC on B2C communication, the correlation coefficient *r* is 0.421. The effect is positive and the strength of the relationship is medium.

B2B outbound communication

The statistical significance of competition in B2C communication is at the significant level of 0.01. Between the competition and the extent of adoption of EC on B2C communication, the correlation coefficient *r* is 0.583. The effect is positive and the strength of the relationship is strong.

Multiple regression analysis on competition

Table 5.66: B2C outbound communication

Questions	Coef.	Std. Err.	t	Pt	Remarks
S3q2.1: Pressure from customers	.4343385	.4266349	1.02	0.310	Not sig.
S3q2.2: Pressure from buyers	.0913385	.3904692	0.23	0.816	Not sig.
S3q2.3: Pressure from suppliers	-.1991065	.5358613	-0.37	0.710	Not sig.
S3q2.4: Vendors actively marketing EC	-.0546639	.3065749	-0.18	0.859	Not sig.
S3q2.5: Rivalry in the business	.3720777	.3432361	1.08	0.280	Not sig.
S3q2.6: Customers switching to a competitor	-.3065555	.2069717	-1.48	0.140	Not sig.

For a unit increase in B2C inbound communication, there is an increase in S3q2.1 by 0.4 units, in S3q2.2 by 0.1 units, a decrease in S3q2.3 by 0.2 units, in S3q2.4 by 0.01 units, an increase in S3q2 by 0.4 units and a decrease in S3q2.6 by 0.3 units.

Table 5.67: B2C order taking

Questions	Coef.	Std. Err.	t	Pt	Remarks
S3q2.1: Pressure from customers	.5377401	.3069352	1.75	0.081	Not sig.
S3q2.2: Pressure from buyers	.9039425	.2809164	3.22	0.002	Sig.
S3q2.3: Pressure from suppliers	.0131297	.3847969	0.03	0.973	Not sig.
S3q2.4: Vendors actively marketing EC	.2984478	.2205601	1.35	0.178	Not sig.
S3q2.5: Rivalry in the business	.2824581	.2469354	-1.14	0.254	Not sig.
S3q2.6: Customers switching to a competitor	-.9432265	.1481828	-6.37	0.000	Sig.

For a unit increase in B2C order taking, there is an increase in S3q2.1 by 0.3 units, in S3q2.2 by 0.2 units, in S3q2.3 by 0.3 units, in S3q2.4 by 0.2 units, in S3q2.5 by 0.2 units and in S3q2.6 by 0.1 units.

Table 5.68: B2B inbound communication

Questions	Coef.	Std. Err.	t	Pt	Remark
S3q2.1: Pressure from customers	.7052035	.4849642	1.45	0.147	Not sig.
S3q2.2: Pressure from buyers	.2232561	.4438539	0.50	0.616	Not sig.
S3q2.3: Pressure from suppliers	.3273159	.6079873	0.54	0.591	Not sig.
S3q2.4: Vendors actively marketing EC	-1.265219	.3484897	-3.63	0.000	Sig.
S3q2.5: Rivalry in the business	1.72372	.3901632	4.42	0.000	Sig.
S3q2.6: Customers switching to a competitor	.2992716	.234132	-1.28	0.203	Not sig.

For a unit increase in B2B inbound communication, there is an increase in S3q2.1 by 0.5 units, in S3q2.2 by 0.4 unit, a decrease in S3q2.3 by 0.6 units, in S3q2.4 by 0.3 units, an increase in S3q2 by 0.4 units and a decrease in S3q2.6 by 0.2 units.

Table 5.69: B2B outbound communication

Questions	Coef.	Std. Err.	t	Pt	Remark
S3q2.1: Pressure from customers	-.1759869	.5128582	-0.34	0.732	Not sig.
S3q2.2: Pressure from buyers	.9129833	.4693834	1.95	0.053	Sig.
S3q2.3: Pressure from suppliers	.4339711	.6429574	0.67	0.500	Not sig.
S3q2.4: Vendors actively marketing EC	-.6470584	.368534	-1.76	0.081	Not sig.
S3q2.5: Rivalry in the business	.1155815	.4126045	0.28	0.780	Not sig.
S3q2.6: Customers switching to a competitor	-.5094369	.2475988	-2.06	0.041	Sig.

For a unit increase in B2C inbound communication, there is a decrease in S3q2.1 by 0.2 units, an increase in S3q1.2 by 0.9 units, in S3q1.3 by 0.4 units, a decrease in S3q2.4 by 0.6 units, an increase in S3q2.5 by 0.1 unit and a decrease in S3q2.6 by 0.5 units.

Table 5.70: Summary of the questions on the association between a hotel having its own Internet connection and information intensity

Questions	B2C outbound	B2C order taking	B2B inbound	B2B outbound
	P value	P value	P value	P value
S3q2.2: Pressure from buyers		0.002		0.053
S3q2.4:Vendors actively marketing EC			0.000	
S3q2.5: Rivalry in the business			0.000	
S3q2.6: Customers switching to a competitor		0.000		0.041

Discussion

In this study, six questions are used to measure the relationship between competition and the extent of EC adoption. Of the six questions, four questions proved significant, namely

S3q2.2 (pressure from buyers to use EC), S3q2.4 (vendors actively marketing EC), S3q2.5 (rivalry in the business environment of the hotels) and S3q2.6 (customers switching to a competitor).

With regard to S3q2.4 (i.e. that hotels should consider EC adoption because vendors are marketing EC), if a hotel is not using EC it will be left behind. In Chapter 2 it was shown that managers who are negative towards technology tend to be left behind. These managers have to be careful because they might buy outdated technology systems since they are not up-to-date with what is being sold in the market (Applegate *et al.*, 2009).

There is also a great deal of rivalry in the hotel business (S3q2.5) among the hotels themselves. Since it is a competitive market, then it is bound to have a great deal of rivalry, especially in B2B inbound communication because every hotel wants to look different from other hotels, and wants to please its clients. Being receptive to new ideas and innovations is crucial; otherwise a hotel will be left behind (Huang & Lin, 2006). It is in B2B inbound communication that all the innovative ideas are being put in place.

It is not surprising that there is pressure from buyers (S3q2.2) to use EC, because if a hotel does not use EC, its customers will switch to other hotels, as the hotel industry is a competitive one. The same applies to B2B outbound communication: there is much pressure from suppliers for the hotels to use EC as suppliers do not like customers who will be using a manual system when there is an easier method of working. According to Ham *et al.*, (2005), hotels that increase their customer satisfaction through website information and high quality product provision will have a significantly positive influence on their customers. Hotels have to address the customers' needs if they want to stay in business.

If a customer places an order and the hotel takes too long to respond or does not even respond at all, it is easy for that customer to take patronage elsewhere (S3q2.6). Customers will stay at hotels that listen to their suggestions and provide what they want. Once a customer discovers that another hotel is offering better benefits, it is easy for that customer to take his patronage to the latter (Ham *et al*., 2005; McCole, 2002).

B2B inbound communication significantly shows that vendors are actively marketing EC to hotels and that there is a great deal of rivalry in the business environment, thus making it necessary for hotels to consider EC.

Table 5.71: Multiple regression analysis on the extent of EC adoption

Equation	**RMSE**	**R-sq.**	**F**	**P**
B2C outbound communication	1.027	0.217	4.983	.000
B2C order-taking	.739	.437	13.977	.000
B2B inbound communication	1.167	.355	9.915	.000
B2B outbound communication	1.234	.336	9.115	.000

RMSE = Root Mean Square Error

Regarding the extent of overall adoption prediction, all the dependent variables have a positive influence on the extent of adoption of EC on competition prediction. The dependent variables significantly contribute to the model for predicting the extent of adoption of EC on competition.

The R^2 overall variation is explained by the independent variables in the model. In the case of B2C order taking, the value of R^2 is .44, which means that 44% of the variance in the overall extent of adoption of EC on competition is explained by this model. According to Leech *et al.*, (2005), the effect size of this model is large.

Conclusion

There is a positive correlation between the dependent variable and the extent of EC adoption, as well as with multiple regression *p*, which is also significant. The hotel industry is a very competitive one which leads to a great deal of rivalry within the industry. Customers switch from one hotel to another, depending on what the hotels are offering. This is why the hotels that were surveyed reported that they are receiving pressure from their customers to offer certain services that the customer expects to find. If these services are not provided, the customer will simply switch to another hotel. There is very little customer loyalty since the industry is wide and customers can easily change to hotels that

offer what they want. On the other hand, vendors are also marketing EC products and if a hotel is not up-to-date on what is happening, it may end up buying obsolete products.

5.6 The Extent of EC Adoption

The purpose behind Research Question 4 is to test for associations between the dependent variables and the independent variables. Multiple regression analysis is used to test the study model on the influence of the independent variables on the dependent variables in terms of the extent of EC adoption.

5.6.1 B2C Outbound Communication

Research Question 4 (B2B outbound communication)a: What factors can predict the extent of adoption of EC on B2C outbound from a combination of technological, organisational and environmental factors?

Compatibility, complexity, information intensity and competition show that hotel managers have an influence on the extent of EC adoption. Relative advantage has no influence on the extent of EC adoption. The correlation analysis of B2C outbound communication on the extent of adoption of EC is indicated in Table 5.72 below. The analysis shows that five factors have an influence on the extent of EC adoption. The independent variables for multiple regressions are as follows: compatibility, complexity, managers' attitudes, information intensity and competition.

Table 5.72: Correlation analysis of B2C outbound communication

	Corr.	**Sig. (P)**
Relative advantage	.033	1.
Compatibility	.165**	.003
Complexity	.122*	.027
Attitude	.205**	.000
Information intensity	.465**	.000
Competition	.538**	.000

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Using the regression method, a significance model emerged (i.e. $F_{5,266} = 15.368$, $p < .0005$). This indicates that some of the independent variables emerged as significance predictors of B2C outbound communication.

R^2 is .609, which is to say the model accounts for 61% of the variance in the B2C outbound communication scores.

Table 5.73: Multiple regression analysis of B2C outbound communication

F	**Df**	**Residual df**	**Sig. (P)**	**R**
15.368	5	266	.000	.609

The variables that proved significant are:

Predictor variable	**Beta**	**p**
Complexity	.234	.000
Manager's attitude	.273	.000
Information intensity	.418	.007
Competition	.359	.000

The beta coefficients give a measure of the contribution of each variable to the model. A large value indicates that a unit change in this predictor variable has a large effect on the dependent variable. All the variables have a positive influence on the extent of adoption of EC on B2C outbound communication, except for management attitudes, which have a negative influence. Compatibility does not significantly contribute to the model for predicting the extent of adoption of EC on B2B outbound communication.

Table 5.74: Multiple regression coefficients (a)

	Standardised coefficients		Sig.
	Beta	Std. Error	Beta
Complexity	.234**	.040	.000
Manager's attitude	-.273**	.039	.000
Information intensity	.418**	.048	.000
Competition	.359**	.050	.000
Compatibility	.052	.039	.124

Dependent variable: B2C outbound
* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Cronbach's alpha for this set of questions (i.e. Questions 4.1 to 4.5) is 0.740. This shows a consistency in the responses and, for the sake of analysis, the questions have thus been joined into a single measure of the extent of e-commerce with regard to B2C outbound communication**.**

A composite of five items on the questionnaire is used to measure the relationship between B2C outbound communication and the independent variables. Table 5.75, below, shows the descriptive data of B2C outbound communication with a mean score of 3.322.

Table 5.75: Descriptive statistics of B2C outbound communication of EC

N	**Mean**	**S.D.**	**Skewness**	**Kurtosis**
327	3.322502	1.087231	-0.21553	0.057335

Table 5.76: Association between a hotel having Internet and B2C order taking

	B2C order taking	**Chi**	**Fisher's**	**Remark**
1	We provide customers with information about our company through websites	7.58	.031	Sig.
2	We provide solutions to customers' problems	6.95	.23	Not sig.
3	We provide after-sales service to our customers	5.31	.039	Sig.
4	When placing an order, customers can link to other places of interest	14.29	.000	Sig.
5	Customers have access to online entertainment from our homepage	.002	1.000	Not sig.

In the above table (Table 5.76) there is a close association between the hotel having an Internet connection and the B2C outbound communication. Fisher's exact was significant in all the items, except item 5, where $1 > p$.

It is expected that hotels provide information to their customers; otherwise customers can take their patronage to the hotel's competitors. It is important therefore for every hotel to have a website.

The respondents reported that hotels ought to provide after-sales service to their customers as well as have an Internet connection. They asked how hotels could provide an after-sales service if they do not have Internet through which to keep potential customers informed of what they have to offer.

The respondents also accept that if customers cannot link up with the hotel's website (because none exists), they will take their patronage to one of the hotel's competitors. In addition, customers often work with agents, who charge commission and in this way it becomes very expensive for customers to book a hotel since they must pay the agent's commission fee.

Table 5.77: Table showing the association between the hotel having a website and B2C outbound communication

	B2C outbound communication	**Chi**	**Fisher's**	**Remark**
1	We provide customers with information about our company through websites	22.35	.001	Sig.
2	We provide solutions to customers' problems	12.42	.005	Sig.
3	We provide after-sales service to our customers	20.12	.000	Sig.
4	When placing an order, customers can link to other places of interest	6.04	.029	Sig.
5	Customers have access to online entertainment from our homepage	.020	1.000	Not sig.

The respondents felt that it was not necessary for customers to have access to online entertainment from a hotel's homepage. But the hotels felt it necessary for them to provide their customers with information on the website. If customers do not find the information they seek from the website then they will go to other hotels where they can find all the information they need. Hotels should be able to sell themselves through their websites, because the decision that will be taken by the customer depends on the information contained on the website.

There is an association between hotels providing solutions to their customers' problems, providing an after-sales service and placing orders. If customers' problems are not solved, the customers will be unhappy and that hotel will have lost customers. It is also advisable for hotels to provide an after-sales service to their customers; that way the customers are indirectly forced to be loyal to that hotel. It is of importance for the customers to be able to place an order and then to click on a link to other places of interest. This helps to encourage the traveler that it is in fact worth visiting that specific hotel. If a hotel offers links to other places of interest, it is marketing itself and this will encourage the customers to choose it as their destination. Links to other websites will make the customers want to

know how much information there is on that website and in this way the hotel will be encouraging its potential customers to use the Internet and make a booking at that hotel.

5.6.2 B2C Order taking

Research Question 4 (B2B order taking): What factors can predict the extent of adoption of EC on B2C order taking from a combination of technological, organisational and environmental factors.

Cronbach's alpha for this set of questions (i.e. Questions 4.6 to 4.9) is 0.650. This indicates a reasonable consistency to the responses. (The alpha value increases to 0.791 if Q4.9 is omitted from the set. However, the researcher has chosen to leave it in for the sake of completeness.) For the sake of analysis, the questions have thus been joined into a single measure of the extent of e-commerce with regard to B2C order taking.

Table 5.78, below, indicates the correlation analysis of EC adoption on B2B communication. Compatibility, complexity, information intensity and competition have shown that they have an influence on the extent of adoption of EC on B2C order taking. The rest of the independent variables do not have a relationship with the dependent variable. A composite of four items on the questionnaire is used to measure the relationship between B2C order taking and the independent variables.

Table 5.78: Correlation analysis of B2C order taking

Independent	**Corr.**	**Sig.**
Relative advantage	.117	1.
Compatibility	.244**	.000
Complexity	.295**	.000
Attitude	.072	.192
Information Intensity	.358**	.000
Competition	.421**	.000

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

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

Table 5.79: Multiple regression analysis of B2C order taking

F	Df	Residual df	Sig. (P)	R
15.111	4	286	.000	.526

Using the regression method, a significance model emerged (i.e. $F_{4,286} = 15.111$, $p < .000$). R^2 is .526, which is to say that the model accounts for 53% of the variance in the B2C order taking.

The significant variables include:

Predictor variable	Beta	p
Compatibility	.144	.000
Complexity	.521	.000
Information intensity	.171	.000
Competition	.371	.000

Relative advantage and managers' attitudes offer no significant contribution to this model. The beta coefficients give a measure of the contribution of each variable to the model. All the variables have a positive influence on the extent of adoption of EC on B2C outbound communication.

Table 5.80: Multiple regression coefficients

	Standardised coefficients		Sig.
	Beta	Std. Error	Beta
Complexity	.521**	.042	.000
Information intensity	.171**	.041	.000
Competition	.371**	.042	.000
Compatibility	.144**	.041	.000

Dependent variable: order taking
* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

A composite of four items on the questionnaire is used to measure the relationship between B2C outbound communication and the independent variables. Table 5.81 below shows the descriptive data of B2C order taking with a mean of 3.548.

Table 5.81: Descriptive statistics of B2C order taking of EC

N	Mean	S.D.	Skewness	Kurtosis
328	3.547631	1.288917	-0.73104	1.735809

Table 5.82: Association between the hotel having a website and B2C order taking

	B2C order taking	Chi	Fisher's	Remark
6	We accept electronic bookings	11.005	.007	Sig.
7	We allow customers to electronically track and inquire after their bookings	4.51	.050	Sig.
8	We accept electronic payments from customers	17.23	.001	Sig.
9	We allow customers to check out electronically	0.13	1.000	Not sig.

In Table 5.82 above there is a close association between the hotel having a website and B2C order taking. Fisher's exact is significant in all the items, except in item 9 where $p<1$. There is an association between having a website and B2C order taking and there has to be one because if the hotels accept bookings electronically then they must email the customer. This is why when the respondents were asked if they use email, in total only 6% reported they do not use email.

If customers are to be allowed to track their bookings electronically, then the hotel needs to offer a website through which clients can make bookings. Customers are allowed to electronically pay their accounts to the hotel, which means that a client can transfer his/her money from any country to the account of the hotel where he/she will be staying. Such an

action involves both the customer and the hotel using EC, and this is done through the hotel's website.

The only question that did not prove significant is that of e-checkout, where 86% of the respondents reported that they do not use e-checkout, but instead want their customers to come to the hotel's reception counter and they will check them out manually. It takes time for the customer to stand in the queue in order to check out, especially when that customer has already made payment.

Table 5.83: Association between the hotel having Internet and B2C order taking

	B2C order taking	**Chi**	**Fisher's**	**Remark**
6	We accept electronic bookings	23.07	.000	Sig.
7	We allow customers to electronically track and inquire after their bookings	6.69	.018	Sig.
8	We accept electronic payments from customers	9.15	.007	Sig.
9	We allow customers to check out electronically	.727	.548	Not sig.

All but one question (item 9) is not significant; the other questions show that there is an association between having an Internet connection and B2C order taking. Booking is done over the Internet and in that way the hotel is able to confirm its bookings with customers. Ninety-five percent of the respondents reported that they use the Internet to make electronic bookings; customers can check and track their bookings by way of the Internet as well as do payments. Orders are taken by way of the Internet and the customer receives a response via the Internet. If it is an online booking then the customer receives booking information back immediately as to whether or not there is a room available and when the room will be available. If the customer does not use online booking, he/she can book by way of email and then wait for an email response from the hotel.

The question on customers checking out electronically still comes out as insignificant in that customers are expected to check out via the hotel reception counter. The same hotels accept electronic payments yet expect their customers to check out manually, even though it takes time and the customer may well have to stand in a queue.

5.6.3 B2B Inbound Communication

Research Question 4 (B2B inbound communication): What factors can predict the extent of adoption of EC on B2B inbound communication from a combination of technological, organisational and environmental factors?

Cronbach's alpha for this set of questions (i.e. Questions 4.10 to 4.13) is 0.794. This shows a consistency to the responses and, for the sake of analysis, the questions are thus joined into a single measure of the extent of e-commerce with regard to B2B inbound communication.

Table 5.84 below indicates the correlation analysis of EC adoption on B2B communication. Compatibility, complexity, manager's attitude, information intensity and competition show that they have an influence on the extent of adoption of EC on B2C order taking. The relative advantage is not significant. A composite of four items on the questionnaire is used to measure the relationship between B2B inbound communication and the independent variable.

Table 5.84: Correlation analysis of B2B inbound communication

Independent	**Corr.**	**Sig.**
Relative advantage	.029	1.
Compatibility	.143*	.011
Complexity	.338**	.000
Manager's attitude	.234**	.000
Information intensity	.503**	.000
Competition	.583**	.000

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Table 5.85: Multiple regression analysis of B2B inbound communication

F	Df	Residual df	Sig. (P)	R
27.420	5	264	.000	.737

Using the regression method, a significance model emerged (i.e. $F_{5,264} = 27.420$, $p < .000$). R^2 is .737, which to say that the model accounts for 74% of the variance in the B2B inbound communication.

The significance variables include:

Predictor variable	Beta	p
Complexity	.306	.000
Information intensity	.331	.000
Competition	.483	.000
Compatibility	-.109	.000
Manager's attitude	-.207	.000

The beta coefficients have given a measure of the contribution of each variable to the model. A large value indicates that a unit change in this predictor variable has a large effect on the dependent variable. All the variables have a positive influence on the extent of adoption of EC on B2B inbound communication, except for compatibility and manager's attitude, which have significantly contributed to the model but have a negative relationship with the extent of adoption of EC on B2B inbound communication.

Table 5.86: Multiple regression coefficients

	Standardised coefficients		Sig.
	Beta	Std. Error	Beta
Complexity	.306**	.034	.000
Information intensity	.331**	.038	.000
Competition	.483**	.038	.000
Compatibility	-.109**	.032	.000
Manager's attitude	-.207**	.034	.000

Dependent variable: B2B.inbound
* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Table 5.87 below shows the descriptive data of B2B inbound communication and has a mean score of 2.412.

Table 5.87: Descriptive statistics of competition of EC

N	**Mean**	**S.D.**	**Skewness**	**Kurtosis**
324	2.418059	1.76369	3.681124	44.80607

Table 5.88: Association between the hotel having a website and B2B inbound communication

	B2B inbound communication	**Chi**	**Fisher's**	**Remark**
10	We share product and inventory planning information with our suppliers through email	.095	1.000	Not sig.
11	We permit suppliers to link up to our database through Enterprise Resource Planning	.62	.5	Not sig.
12	We send suppliers regular updates about new developments in our company	.002	1.000	Not sig.
13	We provide specific online information about the product specifications that our suppliers must meet through email	1.94	.199	Not sig.

In Table 5.88 above there is no association between the hotel having a website and B2B outbound communication. Fisher's exact was >*p* in all the items. There is no association between the Internet and B2B outbound communication. The results of the questions asked show that there is no association and the hotels do not see any of the questions as significant to the hotel. The hotel's interest is more focused on customer care and what the customer wants. The customer should be able to obtain all the information that he/she wants through the Internet. But the hotel's relationship with its suppliers is different because the former are not interested in providing all the information about the hotel to the supplier. The hotel also probably wants to be treated as a customer by its suppliers, as it should be the responsibility of the suppliers to make sure the hotel is a happy customer. There is also no association between the hotel having an Internet connection and B2B inbound communication.

5.6.4 B2B Outbound Communication

Research Question 4 (B2B outbound communication): What factors can predict the extent of adoption of EC on B2B outbound from a combination of technological, organisational and environmental factors?

Cronbach's alpha for this set of questions (i.e. Questions 4.14 to 4.17) is 0.886. This shows consistency of responses and, for sake of analysis, the questions are thus joined into a single measure of the extent of e-commerce with regard to B2B outbound communication.
Table 5.89 below indicates the correlation analysis of EC adoption on B2B communication. Compatibility, complexity, information intensity and competition show that they have an influence on the extent of adoption of EC on B2C order taking.A composite of four items on the questionnaire is used to measure the relationship between B2B outbound communications.

Table 5.89: Correlation analysis on B2B outbound communication

Independent	**Corr.**	**Sig.**
Relative advantage	.013	1.
Compatibility	.347**	.000
Complexity	.195**	.000
Manager's attitude	-.014	.803
Information intensity	.467**	.000
Competition	.421**	.000

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Table 5.90: Multiple regression analysis of B2B outbound communication

F	**Df**	**Residual df**	**Sig. (P)**	**R**
12.116	4	273	.000	.482

Using the enter method, a significance model emerged of $F_{4,273} = 12.116$, $p < .000$.
R^2 is .482, which is to say that the model accounts for 48% of the variance in the B2B outbound communication scores.

The significance variables include:

Predictor variable	**Beta**	**p**
Compatibility	.197	.000
Complexity	.288	.000
Information intensity	.336	.000
Competition	.268	.000

The beta coefficients give a measure of the contribution of each variable to the model. All the variables have a positive influence on the extent of adoption of EC on B2B outbound communication. Relative advantage does not significantly contribute to the model for predicting the extent of adoption of EC on B2B communication.

Table 5.91: Multiple regression coefficients

	Standardised coefficients		Sig.
	Beta	Std. Error	Beta
Complexity	.288**	.045	.000
Information intensity	.336**	.051	.000
Competition	.268**	.052	.000
Compatibility	.197**	.045	.000

Dependent variable: B2B outbound
* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Table 5.92 below shows the descriptive data of B2B outbound communication with a mean score of 3.098.

Table 5.92: Descriptive statistics of B2B outbound communication

N	**Mean**	**S.D.**	**Skewness**	**Kurtosis**
312	3.097974	1.256711	-014192	-0.91972

In the multiple regression table (Table 5.91) all the variables significantly contribute to the model predicting the extent of adoption of EC on B2C outbound communication. The independent variables have a positive influence on the extent of adoption of EC on B2C communication. The effect size of this model is medium.

Table 5.93: Association between a hotel having Internet and B2B outbound communication

	B2B outbound communication	**Chi**	**Fisher's**	**Remark**
14	We search and locate potential suppliers online	14.5	.001	Sig.
15	We always place and track orders with suppliers electronically	2.14	.176	Not sig.
16	We use online market places to source suppliers	4.795	.039	Sig.
17	We allow suppliers to submit bids online	5.31	.025	Sig.

In Table 5.93, above, there is an association between hotels having Internet and B2B outbound communication, except in item 15. Fisher's exact was $p<$ in the other items.

The results of most of the questions asked show that there is an association between a hotel having an Internet connection and all the questions asked, except where the hotel has to track orders with suppliers electronically. The hotel has to have an Internet connection to be able to check up on and look for suppliers. The hotel can do this by way of the yellow pages, but the Internet will give a better view of what the supplier has to offer. What has not proved significant is that hotels track orders electronically. But the other questions have proved significant (i.e. using online markets to source suppliers and allowing suppliers to submit their bids online).

Table 5.94: Table showing the association between the hotel having a website and B2B outbound communication

	B2B outbound communication	**Chi**	**Fisher's**	**Remark**
14	We search and locate potential suppliers online	30.652	.000	Sig.
15	We always place and track orders with suppliers electronically	10.148	.002	Sig.
16	We use online market places to source suppliers	11.861	.001	Sig.
17	We allow suppliers to submit bids online	4.468	.043	Sig.

The results from all the questions show that there is an association between a hotel having its own website and B2B outbound communication. A hotel needs a website to be able to locate potential suppliers and also see what it is that the suppliers claim they can deliver to the hotel. A hotel will be able to see the products that are offered by the suppliers. For all the activities that need doing, the hotel needs a website. To be able to use online markets and source suppliers, a website is needed. If the hotel is using a website then it must also be using the Internet to obtain all that it needs. Interestingly, placing and tracking orders with a supplier proved not to be significant in relation to having an Internet connection, but it did prove significant in terms of having a website. The reason for this could be that the

respondents assumed that it is more important to have a website than to just have Internet access and respond to a supplier without first checking that supplier's website.

Table 5.95: Correlation among independent variables and dependent variables

Variable

Variable	1	2	3	4	5	6	7	8	9
1	….								
2	.000								
3	.228	.201							
4	.094	.005	1.000						
5	1.000	1.000	.563	.000					
6	1.000	1.000	1.000	.000	.000				
7	1.000	.260	.000	.000	.000	.000			
8	1.000	1.000	.001	.007	.000	.000	.000		
9	1.000	1.000	1.000	.000	.000	.000	.000	.000	….

1 = relative advantage; 2 = compatibility; 3 = complexity; 4 = Information intensity; 5 = competition.

6 = B2C outbound; 7 = B2C order-taking; 8 = B2B inbound communication; 9 = B2B outbound communication.

Table 5.98 above shows a summary of the dependent and independent variables and how they relate to each other.

Technological factors: The only variables that have proved significant in the dependent variables were complexity with B2C order taking and B2B inbound communication. There is also a relationship between compatibility and information intensity, as well as another relationship between relative advantage and compatibility.

Environmental factors: Information technology and competition have proved significant with each other and with all the dependent variables. The relationship between the extent of EC and environment is good.

B2C outbound: The only variables that have proved significant are the environmental variables. This means that there is a good relationship between the environment and B2C outbound, and a poor relationship between B2C and technological factors.

B2C order-taking: The variables that have proved insignificant are the technological factors, except for compatibility. The variables that have proved significant are the environmental variables. This means that there is a good relationship between the environment and B2C order taking and compatibility, and a poor relationship between B2C order taking and the other technological factors. B2C order taking also has shown a good relationship with B2C outbound communication.

B2B inbound: Environmental variables are significant, having a good relationship between B2B inbound and environmental factors. In the case of technological factors, complexity has a positive relationship while the other two variables are not significant. B2C outbound and B2C order taking also show a positive relationship with B2B inbound communication.

B2B outbound: There is a positive relationship between the environmental factors and B2B outbound. While there is no relationship at all with the technological factors, the variables are not significant. In relation to the other dependent variables, there is a positive relationship between B2B outbound and all the other dependent variables.

5.7 Manova

5.7.1 Website

Table 5.96: Comparison of dependent variables by having a website or not

		N	Mean	SD	T	Sig	Remarks
B2C inbound	yes	182	54.9	28.6	.5	0.627	Not sig
	No	117	50.9	25.9			
B2C order taking	yes	125	69.1	19.7	0.3	0.778	Not sig
	No	48	67.5	16.8			
B2B inbound	yes	125	50.6	15.1	-0.7	0.496	Not sig
	No	48	57.1	23.8			
B2B outbound	yes	118	72.0	30.1	0.2	0.831	Not sig
	No	65	66.7	38.1			

The table shows that there is not statistical significance between the independent variables and having a website. All the *p* values are greater than 0.05.

5.7.2 Location

Table 5.97: Comparison of dependent variables by location of respondent

Dependent		SS	Df	Mean squares	F	P
B2C	Between groups	1251.202	6	208.534	18.687	.000
	Within groups	3570.908	320	11.159		
	Total	4822.110	326			
B2C	Between groups	518.777	6	86.463	7.397	.000
	Within groups	3752.122	321	11.689		
	Total	4270.899	327			
B2B	Between groups	1434.979	6	239.163	16.333	.000
	Within groups	4641.712	317	14.643		
	Total	6076.691	323			
B2B	Between groups	3557.629	6	592.938	75.451	.000
	Within groups	2396.880	305	7.859		
	Total	5954.510	311			

The F-value of each of the dependent variables has a corresponding p-value that is 0.000 in each variable. Since the values are less than 0.05 it follows that the null hypotheses of equal means are rejected; that is, there are statistically significant differences among the means.

5.7.3 Gender

Table 5.98: Comparison of dependent variables by gender of respondent (B2C Outbound)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
B2C outbound	Equal variances assumed	.034	.854	-2.316	284	.021	-1.05496	.45551	-1.95157	-.1583
	Equal variances not assumed			-2.324	271.755	.021	-1.05496	.45398	-1.94873	-.1611

Levene's test for equality of variance shows that the variances of the two groups are equal. Hence we can assume equal variance to test for equality of means.

Table 5.99: Comparison of dependent variables by gender of respondent (B2C Order taking)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
B2Corderta king	Equal variances assumed	5.41	.021	-1.070	285	.285	-.46204	.43169	-1.31175	.3876
	Equal variances not assumed			-1.048	243.373	.296	-.46204	.44086	-1.33043	.4063

Levene's test for equality of variance shows that the variances of the two groups are equal. Hence we can assume equal variance to test for equality of means.

Table 5.100: Comparison of dependent variables by gender of respondent (B2B Inbound)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
B2Binbound	Equal variances assumed	.004	.949	-1.512	281	.132	-.77028	.50960	-1.77341	.2328
	Equal variances not assumed			-1.512	266.798	.132	-.77028	.50931	-1.77305	.2324

The variance for equality shows that there is no relationship between B2B inbound communication and gender (p = 0.949, which is greater than 0.05) and the variances can therefore be assumed to be equal.

Table 5.101: Comparison of dependent variables by gender of respondent (B2B Outbound)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
B2B outbound	Equalvariances assumed	.890	.346	-1.287	274	.199	-.68654	.53359	-1.73699	.3639
	Equal variances not assumed			-1.294	261.141	.197	-.68654	.53064	-1.73142	.3583

The variance for equality shows that there is no relationship between B2B outbound and gender (p = 0.346, which is greater than 0.05) and the variances can therefore be assumed to be equal.

5.7.4 Age

Table 5.102: Comparison of dependent variables by age of respondent

Dependent		SS	df	Mean squares	F	P
B2C	Between groups	1438.984	4	359.746	.43	.784
	Within groups	154808.932	187	827.855		
	Total	156247	191	818.052		
B2C	Between groups	2190.725	4	547.681	1.28	.279
	Within groups	88563.991	207	427.845		
	Total	90754.717	211			
B2B	Between groups	2129.36	4	532.339	1.59	.1813
	Within groups	36423.272	109	334.158		
	Total	38552.632	113	341.174		
B2B	Between groups	4995.522	4	1248.88	1.34	.258
	Within groups	110584.115	119	929.28		
	Total	115579.637	123			

The F-value of each of the dependent variables has a corresponding p-value where p> 0.000 in each variable. Since the values are greater than 0.05 it follows that the null hypothesis of equal means are accepted; that is, there are statistically insignificant differences among the means. The p-value shows that there is no relationship between each of the dependent variables and the age of the managers.

5.7.5 Position

Table 5.103: Comparison of dependent variables by position of respondent

Dependent		SS	df	Mean squares	F	P
B2C	Between groups	398.378	12	33.198	2.629	.002
	Within groups	3510.783	278	12.629		
	Total	3909.162	290			
B2C	Between groups	279.965	12	23.330	2.141	.015
	Within groups	3040.049	279	10.896		
	Total	3320.014	291			
B2B	Between groups	692.215	12	57.685	3.643	.000
	Within groups	4354.115	275	15.833		
	Total	5046.330	287			
B2B	Between groups	1055.139	12	87.928	5.500	.000
	Within groups	4236.231	265	15.986		
	Total	5291.371	277			

At 0.05 level of analysis, the data demonstrated that the difference in position based on B2C inbound communication, B2C order taking, B2B inbound communication and B2B outbound communication is significant. The difference was significant for all the dependent variables and shows the relationship between the dependent variables and the position of the manager. Since the values are less than 0.05, it follows that the null hypotheses of equal means are rejected that is there are statistically significant differences among the means.

6 CHAPTER: DISCUSSION

6.1 Introduction

Chapter 6 contains a review of this study. A summary of the study's findings is presented, as well as interpretations and final recommendations for practical implementation of the findings.

6.2 Findings

The purpose of this study has been to identify the determinants that influence the decision-makers of hotels in South Africa to either adopt or reject EC. Based on the TOE model (technological, organisational and environmental contexts), the research questions that were posed focused on identifying the factors that affect the decision of South African hotel managers to adopt EC and establishing the extent of adoption of EC. The results for each specific research question were as follows:

6.2.1 Research Question 1: Technological context

Among the three technological factors that were researched, the results show that complexity and compatibility have a positive relationship with the extent of EC adoption. Comparing the two factors, the results indicate that the relationship between complexity and the extent of EC adoption is stronger than it is between compatibility and the extent of adoption of EC. The results also show that relative advantage does not correlate with the extent of adoption of EC. The research in this study therefore confirms that:

1. Managers' perceptions of EC, regarding compatibility, have a significantly positive relationship with the extent of adoption of EC in B2C outbound communications, B2C order taking, B2B inbound communication and B2B outbound communication.

2. Managers' perceptions of EC, regarding complexity, have a significantly positive relationship with the extent of adoption of EC in B2C outbound communications,

B2C order taking, B2B inbound communication and B2B outbound communication.

6.2.2 Research Question 2: Organisational context

The organisational factors have three variables, namely size, managers' attitude, and managers' IT knowledge. Managers' attitude is the only factor that has a positive relationship with the extent of adoption of EC. The managers' attitude correlated with the extent of adoption of EC only in B2C outbound communication. The relationship was negligible. Research in this study therefore confirms that:

The managers' attitude toward EC has a significantly positive relationship with the extent of adoption of EC in B2C communication.

6.2.3 Research Question 3: Environmental context

The environmental factors that are used in this study are information intensity and competition. There is a positive relationship with the extent of adoption of EC with the two environmental factors. Between the two factors, the relationship is stronger between competition and the extent of adoption of EC than it is between information intensity and the extent of adoption of EC.

The research in this study therefore confirms that:

1. Information intensity has a significantly positive relationship with the extent of adoption of EC in B2C outbound communications, B2C order taking, B2B inbound communication and B2B outbound communication.

2. Competition has a significantly positive relationship with the extent of adoption of EC in B2C outbound communications, B2C order taking, B2B inbound communication and B2B outbound communication.

6.2.4 Research Question 4: Extent of adoption of EC

Regression analysis is used to assess the extent of EC adoption. The results are as follows:

1. Correlation analysis indicates that there are five factors that influence the extent of adoption of EC in B2C outbound communication. The prediction of EC adoption, when using regression analysis, indicates that the four independent variables significantly predict the model, with R^2 being 61% of variance. The independent variables that are shown to influence the extent of adoption of EC in B2C outbound communication are: compatibility, complexity, managers' attitude, information intensity and competition.

2. Correlation analysis indicates that four factors influence the extent of adoption of EC in B2C order taking. The prediction of EC adoption, when using regression analysis, indicates that the four independent variables significantly predict the model, with R^2 being 53% of variance. The independent variables that are shown to influence the extent of adoption of EC in B2C order taking are: compatibility, complexity, information intensity and competition.

3. Correlation analysis indicates that five factors influence the extent of adoption of EC in B2B inbound communication. The prediction of adoption of EC, when using regression analysis, indicates that the four independent variables significantly predict the model, with R^2 being 74% of variance. The independent variables that are shown to influence the extent of adoption of EC in B2B outbound communication are: compatibility, complexity, manager's attitude, information intensity and competition.

4. Correlation analysis indicates that four factors influence the extent of adoption of EC in B2C outbound communication. The prediction of adoption of EC, when using regression analysis, indicates that the three independent variables significantly predict the model, with R^2 being 48% of variance. The independent variables that are shown to influence the extent

of adoption of EC in B2B outbound communication are: compatibility, complexity, competition and information intensity.

6.3 Interpretations

The findings of socio-demographic, technological, organisational and environmental factors are discussed in this section. This section discusses the research findings in relation to the relevant literature.

6.3.1 Socio-demographic Factors

The socio-demographic factors that have been used in this study relate to the manager's gender, age, position, years of experience and qualifications. Based on the data that was collected, the hotel managers in the South African hotel industry are 56% female and 44% male. With regard to age, at the time of the investigation, 43.35% of the managers were between the ages of twenty-five and thirty-five years and 24.3% were between the ages of thirty-six and forty-five years. There are more employees in the age range of twenty-five to thirty-five years. This is because employees do not stay long in the hotel industry as they do not consider working in the hotel industry to be a career. Instead, they use a job in the hotel industry as a waiting place while they look for something better. Over 60% of the respondents have a managerial position, either as front desk managers, assistant managers or duty managers. The length of service for the managers varied a great deal: the highest percentage (13%) is for those who have worked in the industry for three years, followed by 11%, which are those who have worked in the industry for five years. Those who have worked in the industry for over twenty-five years constitute only 1% of those surveyed.

In respect of:

(a) Qualifications - 20% of the managers have no qualifications. Lertwongsatien & Wongpinunwatana (2003) state that general managers with higher education levels have more positive attitudes towards IT. In the present study, even though some of the managers surveyed did not have any qualifications, they felt that they were able to learn on the job, as over 90% of them said they use all the software

needed to do the job. 20% have a national diploma in hospitality management and 13% have a diploma in hotel management.

(b) Employees - 80% of the hotels have fewer than fifty employees. It could be that some hotels maintain fewer employees so as to achieve the advantages of increased flexibility and the capacity to adjust to changes within the market.

(c) Guestrooms in hotels - 36% of the hotels have fewer than fifty rooms, thus there is no need to employ too many people.

(d) Types of ownership - 39% of the hotels are independent hotels and the other 58% are chain hotels. For the remainder there was no information available.

The findings from the sampled hotels indicate that 94% of the hotels have their own website and only 6% do not have a website. Hotels in the Western Cape are more likely to have a website than hotels in the other provinces. The Western Cape currently has more resources and is better developed compared to Limpopo and Mpumalanga. These findings confirm the fact that those hotels established in big cities make use of technology (Wolff & Pett, 2000). Whether a hotel has a website or not does not make any difference to the extent of adoption of EC, as far as the dependent variables are concerned. The findings show that hotels have to make their own website in order to conduct business effectively and competitively.

Previous studies indicate that older managers are more reluctant to adopt EC innovation than their younger counterparts. The present study also indicates a positive statistical relationship between the extent of adoption of EC and the age of South African hotel managers. The reason for this could be that there are only a few managers surveyed who are older (only 3% of those surveyed are above fifty-five years). Thus, the managers that work in the industry are young and willing to adopt EC. The long service factor has a similar positive correlation with age. The findings of the present study indicate that the

longer a manager has served in the hotel industry, the easier it is for him/her and the more he/she is willing to adopt EC.

6.3.2 Technology Factors

Rogers (2003) discusses five factors in terms of the theory of diffusion of innovation, but the present study has made use of only three factors. These three factors are to do with the manager's perceptions of EC in terms of relative advantage, compatibility and complexity, and are amongst those discussed by Tornatzky& Fleicher (2003).

6.3.2.1 Relative Advantage

Rogers (2003: 229) defines relative advantage as "an innovation that is better than the idea it supersedes". The study indicates that relative advantage is not a predictor of the extent of adoption of EC within the hotel industry. Managers in the South African hotel industry (those surveyed) agree that relative advantage is not a predictor of adoption of innovation.

The results of this study agree with the findings of previous studies, which is to say that managers are not sure about the direct benefits that can be derived from EC (Seyal & Rahman, 2003). In a study by Molla & Heeks (2007), South African firms were asked to state the benefits of EC and it was found that most of the firms at that time were not aware of its advantages. In relation to multiple regression analysis, $p < .01$, in B2C order taking and the overall adoption prediction, three of the dependent variables have a positive influence, even though there is no correlation between them and relative advantage.

6.3.2.2 Compatibility

Compatibility has been defined as "the degree to which a technological innovation is perceived as being consistent with existing operating practices, beliefs, values, past experiences, and needs" (Rogers, 2003: 240). Most of the South African hotel managers surveyed agree that EC is compatible with their organisational business needs, values and beliefs. This is shown by this factor achieving an average score of 4.26. The correlation analysis indicates that there is a positive association between the extent of adoption of EC and managers' perceptions of compatibility. The association is at the significant level of

0.01. There is a positive relationship between a manager's perception of adoption of EC and its compatibility with all the dependent variables.

The findings of this study are consistent with the findings of other studies, which state that compatibility has a positive association with the adoption of innovation (Zhu *et al*., 2003). Lin & Lin (2008) have state that organisations would be more willing to adopt technology if innovations were compatible with the environment and work practices. The present study has found that some of the factors affecting adoption of EC are: whether or not EC is compatible with business needs, and the earlier experiences of innovation adoption.

6.3.2.3 Complexity

Complexity has been defined as "the degree to which an innovation is perceived as relatively difficult to understand and use" (Rogers, 2003: 257). Correlation analysis indicates that there is a positive association, with a medium degree of effect, between the extent of adoption of EC and a manager's perception of complexity. The average score for complexity is 3.87, which indicates that the managers of the hotels surveyed in South Africa agree that EC is complex if there is no industry standard or if the hotel lacks the necessary funding. The relationship between complexity and the extent of adoption of EC is seen in each of the four dependent variables.

This study agrees with prior studies, which have concluded that complexity has a positive relationship with managers' adoption of EC (Riemenschneider, 2003). Lin & Lin (2008) state that, if employees change their existing business procedures, it will have a negative effect on adoption, and no technology will be accepted because of negative previous experience.

6.3.3 Organisational Factors

According to Tornatzky & Fleicher (2003), organisational context can be analysed from two aspects, namely organisational process and structure. The organisational process consists of a manager's attitude towards EC adoption and his/her technology knowledge. For the organisational structure, the factor of size is used. On the decision as to whether or

not to adopt technological innovation, organisational factors are the most frequently cited factors.

6.3.3.1 Organisational Size

In the present study, four questions are asked with regard to organisational size, and each question is a stand-alone question. Two direct questions are asked which measure the size of the business; these questions are related to: (1) the number of rooms available at the hotel and (2) the number of employees employed by the hotel. These are the questions used by Van der Merve & Wocke (2007) as indicators of organisational size.

The results of this study indicate that the employees have an effect on the extent of adoption of EC within the hotel industry. Lin & Lee (2005) state that, if firms have employees who possess technical knowledge of the skills necessary for EC, then those firms are likely to improve their EC. The relationship can be seen in the extent of EC in B2C order-taking and B2B outbound communication.

The reason size is not a predictor could be that 80% of the hotels that responded to this research have fewer than fifty employees. In the case of guestrooms, 36% (the highest percentage) of the respondents said they have fewer than fifty guestrooms.

The results pertaining to size are consistent with those of previous studies, which agree that the size of a hotel does not correlate with the use of IT. Lertwongsatien & Wongpinunwatana (2003) and Zhu & Kraemer (2005) all state that small firms are engineers of innovation but they account for a small share in terms of research and development. Khemtkong & Roberts (2006) claimed that large hotels in Thailand are more ready for IT adoption than smaller hotels. The present study does not agree with that statement because most of the hotels sampled in South Africa have few rooms and yet 96% are connected to the Internet, 95% have their own website and their staff is using the IT available to them.

6.3.3.2 Manager's Attitude Towards EC Adoption

Attitude can be explained as the extent of an individual's favourable or unfavourable reactions toward a given behaviour. The correlation analysis indicates that there is a positive association between the extent of EC, in both B2C outbound communications and B2B outbound communication. Of the managers surveyed from the South African hotel industry, 50% are neutral in their attitude towards EC (p = .0005 on both variables, at a significant level of 0.01), and the effect size is small and positive.

The findings of this study are consistent with the findings of other studies, which state that there is a positive relationship between B2C outbound communication and B2B outbound communication managers' attitude. Of the managers surveyed, 50% showed that they did not perceive attitude to be a predictor of EC. The findings confirm the assessment that, when technologies are considered by managers to be of strategic significance, a realistic approach is taken to analyse new technologies, and it is easier to obtain the necessary resources if management agrees (Zhu & Kraemer, 2005).

6.3.3.3 Manager's Technology Knowledge

There is no correlation between a manager's technological knowledge and the extent of EC adoption. The results are consistent with those of prior studies, which did not find the technological knowledge of managers to be significant (Ham *et al.*, 2005). Lin & Lin (2008) state that low technical ability of managers means that the hotel industry will continue to be at a high risk of experiencing IT problems. The managers surveyed in this study are computer literate (see Table 5.44). In addition, most of the managers were, at the time of the survey, between the ages of twenty-five and thirty-five, and they expected their staff to be computer literate. Of the respondents surveyed, 60% have attended computer classes and 30% have formal qualifications. Over 90% are able to use the software that the hotel expects them to use; this figure includes those who did not attend any classes and/or have no formal qualifications.

6.3.4 Environmental Factors

The environmental context is the field in which the hotels conduct their business (Lertwongsatien & Wongpinunwatana, 2003; Lin & Lin, 2008). Since environmental factors cannot be controlled by organisations, the need exists for organisations to adopt innovations. The factors that were used to investigate environmental context are information intensity and competition.

6.3.4.1 Information Intensity

Information intensity can be explained as the degree of information that is in the product or service of an organisation (Thong, 1999). The average score for information intensity was 4.21, and this indicates that most of the South African hotel managers who were surveyed believe that the hotel industry is an industry of high information intensity. This finding, which is consistent with the findings of Mithas & Whitaker (2007), shows that if the information intensity of a product or service is high, the degree of information system acceptance will be high as well. The correlation analysis indicates that there is a positive association between the extent of adoption of EC and information intensity. The significant level of information intensity is 0.01. The relationship between information intensity and each of the following categories is positive: B2C outbound communications, B2C order taking, B2B inbound communication and B2B outbound communication.

The findings of this study are consistent with studies stating that information intensity has a positive association with the adoption of innovation (Chandra & Calderon, 2009). Lin & Lee (2005) also found information intensity is significant to the extent of IS adoption, unlike Al-Qirim (2006), however, who found information intensity to be an insignificant factor regarding the adoption of innovation.

6.3.4.2 Competition

Competition refers to the degree of competition in the environment in which an organisation operates (Zhu & Kraemer, 2005; Ranganathan *et al*., 2004; Lin & Lee, 2005). The average score for information intensity was 3.29, which indicates that most of the

South African hotel managers surveyed believed that the hotel industry is a highly competitive industry.

This finding is consistent with Zhu & Kraemer's 2005 findings, stating that EC initiatives may be considered as providing a competitive advantage for managing in competitive environments. The correlation analysis indicates a positive association between the extent of adoption of EC and competition. The significant level of information intensity is 0.01. The relationship between the degree of competition and each of the following categories of adoption is positive: B2C outbound communications, B2C order taking, B2B inbound communication and B2B outbound communication.

The findings of this study are consistent with other studies' findings, which state that competition has a positive association with adoption of innovation. Lin & Lin (2008) and Chi *et al.,* (2005) also state that competition is a significant factor in terms of the adoption of EC.

6.4 Practical Implications and Recommendations

The findings have significant implications for (1) managers of hotels who have the intention of adopting EC, or have adopted EC and are looking for full advantages from adoption of EC and (2) suppliers or value chain partners who have adopted EC and target their marketing at EC business with hotels. In this study, the findings indicated that organisations with sufficient resources are more willing to adopt EC.

Using correlation analysis, the managers' perception on relative advantage of EC had a significantly positive influence on the degree of adoption of EC. It is important that managers are aware of the benefits and advantages of EC before they fully implement EC. Hotels may prefer the advantages of EC over traditional methods of buying and selling processes or communications with customers or suppliers. However, managers have to consider how EC will fit with organisational objectives. There are a number of advantages of EC that the hotel can benefit from, for example, increasing sales, reducing costs, enlarging market share or enhancing organisational image. The advantages must be suited to the organisation's ways of doing things.

Using regression analysis, the study found that most of the hotels sampled did not emphasise the organisational ability to adopt EC, but were more concerned about the benefits of adoption of EC. This means that when the hotels realise there are no benefits from adopting EC, there is a possibility that they can continue with the current systems. For suppliers who target their marketing at EC businesses with the hotels, the researcher suggests that more effort be put in by suppliers into promoting the potential benefits of EC adoption.

Using multiple regression analysis and correlation analysis, it is noted that the variable of managers' attitudes towards adoption of EC is influential on the extent of adoption of EC. For suppliers who target their marketing to businesses with the hotels, the researcher suggests that these suppliers take steps to create EC awareness for the hotels with less adoption of EC. Managers may develop more positive attitudes towards adoption of EC when they understand its potential benefits and will be more willing to adopt EC. As managers' attitudes become positive, they are likely to be more receptive to new ideas of adoption. Therefore, suppliers can develop new markets and new production processes, such as innovative product and imaginative advertising.

The managers' technological knowledge did not have a statistically significant influence on the extent of adoption of EC, therefore the result cannot support the conclusion that the managers' technology knowledge did not have an indirect impact on the extent of adoption of EC. Better knowledge of technology will influence managers' attitudes. Knowledge of EC will help the manager understand the current circumstances of industry. The manager will realise which EC systems are most appropriate for the organisation, as it has been shown that the appropriate adoption of EC can bring more competitive advantages and benefits.

The findings of this study show that the extent of adoption of EC by the suppliers and customers has a significant influence on the extent of adoption on B2B EC. The organisation would like to diffuse the EC to as many suppliers and customers as possible to gain full benefit from the B2B EC system. However, it may encounter suppliers who are not interested in EC adoption. The hotel may have to buy from suppliers who are using EC. If these suppliers realise the advantages of EC and successfully implement it, the organisations would benefit competitive advantages in the long term.

7. CHAPTER: LIMITATIONS, RECOMMENDATIONS AND CONCLUSIONS

The chapter provides limitations of the present study, recommendations for future research and a conclusion.

7.1 Limitations

The shortcomings of this study are discussed in this section. The major limitations the researcher experienced during this research process are as follows:

Firstly, one respondent was used from each organisation to fill in the questionnaire. The aim was to have respondents who are in managerial level positions respond to the questionnaire. Over 70% of the respondents were managers at the time of the survey. Although managers are key decision-makers, one person's opinion cannot be truly representative of the entire organisation. The data collected from the managers is also likely to show a self-report bias that presents an enhanced image rather than reflecting the actual case.

Secondly, some of the variables in the study focused on the perceptions of the managers. Managers often discuss what should be happening and not necessarily what is really happening on the ground.

Thirdly, two types of hotel ownership are discussed in the study, that is, the independent hotels and the chain hotels. The independent hotels tend to have resource constraints such as capital and skilled workers, yet the chain hotels get help from the main branch. This results in differing views and some organisational characteristics being potential determinants of EC adoption by hotels.

Fourthly, at the time the data was collected, most of the hotels were being renovated for the 2010 FIFA World Cup competition. It is possible that the information collected at that time and what has happened to date may not be comparable, especially with regard to the

use of e-commerce. The number of employees working at the hotel could have changed and, certainly, the star rating could also have changed since then.

Fifthly, in provinces where data was collected between the months of September and November, the managers tended to be more willing to complete the instrument than in provinces where data was collected in December. In December, the hotels were busy preparing for the Christmas holidays and most of the hotel managers did not have the time to complete the questionnaire. Thus, the researcher ended up with a low response rate and the questionnaire being completed in haste.

Sixthly, the present study is based on the TOE model, which focuses on technological, organisational and environmental factors. The TOE model has been used to examine the factors that affect the adoption of EC. Over forty factors relating to innovation adoption have been looked into in previous studies. Eight factors are examined in this study. There are other important factors that could have been used in the study, such as user satisfaction, government support, organisational policy, social expectations and vendor support. These factors may also influence the decision to adopt EC or not.

Finally, the research model and the directionality of effects were derived from the literature. However, the revisions that are required clearly point to the need for further testing and refinement of the model, that is, the R^2 values of the variables in the model are low. This shows that the model is far from being fully specified, which means there are other values that have to be incorporated and evaluated. In addition, some of the variables had no direct influence and could therefore be omitted in further studies.

7.2 Recommendations for Future Research

According to the study, there are a number of recommendations that can be made.

1. Other studies could be performed using different methods of data analysis. The main analysis methods of this study were correlation analysis and regression analysis. One level of causality of relationships was assumed. Therefore, certain predictors may be the main causes of association. Other tools, therefore, for example structural equation models (SEM), which analyse the associations

between dormant and obvious factors, could be used for further analysis, so as to investigate the result of some factors and increasing awareness of causality relationships on the extent of adoption of EC.

2. The multiple regression analysis of the degree of adoption of EC in this study showed that the "adjusted R^2" for each of the four dependent variables was not 100%, meaning that some further research is needed. For B2C outbound communication, the "adjusted R^2" is .61, meaning that 61% of variance in the extent of adoption of EC can be predicted from the independent variables combined. This means that 39% of variance is unpredictable as a result of a number of unknown factors not examined in this study.

   In the case of B2C order taking, the "adjusted R^2" is .53, meaning that 53% of variance in the degree of adoption of EC can be expected from the independent variables combined. Thus 47% of variance is unpredictable because of factors that were not examined in the study.

   For B2B inbound communication, the "adjusted R^2" is .74, meaning that 74% of variance in the extent of adoption of EC can be expected from the independent variables combined. Thus 26% of variance is unpredictable.

   Finally, for B2B outbound communication, the "adjusted R^2" is .48, meaning that 48% of variance in the extent of adoption of EC can be expected from the independent variables combined. Thus 52% of variance is unpredictable as a result of unknown factors not examined in this study.

3. Further studies could extend this research by incorporating other potential determinants from different perspectives as it has been shown that there are gaps in the adjusted R^2 for the four dependent variables.

4. Of the hotels surveyed, 39% are independent and 58% are chain-owned hotels. The findings of this study should be applicable to other countries as well because most hotels suffer from similar constraints. There could be differences in terms of cross-cultural factors, and environmental factors may have a

significant influence on the adoption of EC in hotels in other countries. To compare these differences, further research could be undertaken in other countries. Such findings would help increase the generalisability of the findings of this study to other countries.

5. The study found that the following factors had no direct effect the extent of adoption of EC: managers' perceptions on relative advantage and size, and managers' technological knowledge. These factors may, however, have an indirect effect on the degree of adoption of EC. More research is needed to examine the association between these factors more extensively.

6. Another study that could be conducted could research why some of the aspects of EC are not being adopted, e.g. the use of online payments, monitoring of online hotel rating sites as the current study revealed that these variables influenced the adoption of EC.

7.3 Conclusions

The present study focused on hotels. Electronic commerce marketing channels can bring more benefits, such as lower prices and better shopping convenience, to customers. The nature of the industry forces hotels to adopt EC, not because they see the benefits, but because they are expected by the industry. The question of whether current theories regarding EC adoption are appropriate for the hotels in South Africa was raised in this study. Hence, the objective of this study was to identify the determinants of the extent of adoption of EC by hotels in South Africa.

The research framework of the study was based on the TOE model of Tornatzky & Fleischer (1990), a model that has been used to examine factors that affect organisational adoption of technology. The study identified eight determinants, which were divided into three types of factors, namely organisational, technological and environmental factors, all of which have an influence on the decision of South African hotels to either adopt or reject EC. The findings indicate that some of the determinants were less important to the decision by hotels in South Africa to adopt EC. As a result of this, the conclusions below could be drawn.

The findings supported the theory of Diffusion of Innovation Theory that relative advantage and compatibility of adopting innovations are considerations that form a manager's attitude towards EC adoption. Managers evaluate adoption on the basis that the innovation will be compatible with the system or cultures used by the hotel and that the innovation will bring additional gain to the organisation. This positive perception shows that managers have already been initiated into the innovation-decision process, as defined by Rogers (1995).

The relationship between a manager's perception of relative advantage and the extent of adoption of EC is statistically insignificant. The most likely explanation for this result is that the factor of relative advantage may have an effect on the primary phase of EC adoption only. When the hotels enhance their level of EC adoption, the determinants of this adoption level would be dependent upon the degree of risks and benefits attached to EC adoption. Also, it could be that managers are unaware of the full benefits of EC.

The study found that when EC is compatible with previous experience of technology, innovation adoption and organisational beliefs, the factor of values is significant in terms of the adoption of EC. Managers with a positive perception EC are more willing to expand the adoption of EC within their organisations.

If an innovation is perceived by the manager as being difficult to use, it is highly possible that the technology will not be adopted. The adoption of EC is affected by previous experience, particularly where technology has been found to be difficult to use in the past. Manager's perception of complexity of the adoption of EC is statistically significant**.** EC adoption does not influence the extent of adoption but only affects the likelihood of EC adoption.

The present study was not in agreement with prior studies, which found that large organisations are better able to adopt EC than small organisations. Most of the hotels surveyed are small, yet, they are willing to expand their EC adoption by employing staff with specialised expertise. Size does not seem to have an impact as far as hotel specific factors are concerned. In terms of adopting EC, small hotels are on the same wavelength as big hotels. There is, therefore, no need of segmenting hotels according to size when

marketing EC products. However, hotels of a higher grade are predicted to have a high level of adoption.

Managers' perceptions towards EC adoption have been recognized as an important factor for the success of technology integration in the hotel industry. Findings from this study show that participants have a positive attitude to adopting EC if they have enough information or knowledge on the technology to be used. The participants seem to have totally accepted the need for EC and are able to base their judgments on the industry's expectations. Otherwise they will lose potential customers. The majority of the managers consider EC as a viable business tool that has the potential to engender significant improvements in the hotel industry.

When hotel managers have a positive attitude towards adoption of EC, they then ensure that the required resources are quickly accessible. The findings of the present study are in agreement with those of previous studies, which show that managers with positive attitudes are more willing to expand their hotels' EC adoption and that they have a strong influence on the hotels (Zhu & Kraemer, 2005). The managers seem to have accepted the rationale for introducing EC in the hotels; their positive attitudes are evident in B2C outbound communication and B2B outbound communication.

EC is technology that is very relevant to hotels if it is explained to the managers. This is because the hotels will appreciate the technology that is being introduced. It is nevertheless important that the technology is introduced properly to the hotels. If it is not introduced properly, it will affect the adoption of technologies to be introduced in the future and the hotels will be reluctant to adopt these. Intensive information would increase the extent of EC adoption by making the organisation aware of the advantages of EC as a competitive tool. The relationship between information intensity and the degree of EC is statistically significant.

The hotel industry is a very competitive one, as the results of this study have shown, and if a hotel is not competitive it will not survive. Due to the competitiveness of the industry, hotels are being forced to become aware of EC as a competitive tool. They are also being forced to increase the extent of their EC adoption. The association between the level of competition and the extent of EC adoption is statistically significant.

Finally, the researcher concludes that hotels can accept EC if managers are made to see the advantages of EC which will also benefit the customers and buyers wanting to use it in the hotels. Unfortunately, technology adoption and use is mistaken for technology availability.

The researcher hopes that this study will supply the managers and owners of South African hotels with useful information, which will help them to understand the importance of EC adoption. It is also hoped that the present study will help them to develop strategies with regard to EC, so that they might obtain the potential benefits of EC and gain a competitive advantage. The purpose of this study has been to identify the important factors that affect the decision of hotels with regard to EC adoption. The results will not only expand the current body of knowledge on EC, but also contribute to the knowledge of hotel managers, the South African Ministry of Economic Development, EC consultants and the South African Tourism Industry.

The developed framework helps to better understand the relationship between each of the factors used and the extent of EC adoption, and also to verify what the factors affecting this relationship are. The study contributes to the literature on EC adoption in hotels by increasing the empirical evidence available, applying the TOE model to the hotel industry in South Africa, an area to which it had not been applied yet. The study helps to achieve a better understanding of the driving forces of EC incidence.

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APPENDIX 1: Questionnaire

Section 1: TECHNOLOGICAL CONTEXT

Relative Advantage of EC

For each of the following questions, please indicate by a **tick** the answer that best describes your hotel or how you feel.

Questions	Yes	No
1. Does the hotel have internet service?		
2. Does the hotel have its own website?		

Question 3

If your answer in **question 2 was NO, please answer** the following question

Why has your business chosen not to have its own website?

Costs associated with it are too high	Experts not available to maintain Website	Other, please specify

Question 4 The question below is about how long the hotel has had the following features.

Facilities available at your Hotel	N/A	0-2yrs	2-4yrs	4-6yrs	6-8yrs	8-10yrs
4.1 e-mail based bookings						
4.2 Online real time booking						
4.3 Global Distribution System						
4.4 Internet Café						
4.5 Internet in all guest rooms						
4.6 Wireless Internet						
4.7 Property Management Software						
4.8 E-check out from room						
4.9 Video conferencing						
4.10 Local area network for back office						
4.11 Other, please specify						

Question 5: The question below is about your perception on technology characteristics.

My Perception of EC in the Hotel Industry:	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
5.1 we can reach international markets because of EC					
5.2 we can sell our products and services because of EC					
5.3 EC allows us to save time in searching for resources					
5.4 we can gain IT expertise because of EC					
5.5 we can easily purchase products and service for the business because of EC					
5.6 we learn more about our competitors from EC					
5.7 we can advertise and market better because of EC					
5.8 EC provides timely information for decision making purposes					
5.9 EC enhances the company's image					
5.10 we can gather information more efficiently					
5.11 we can reduce cost of performing business transaction					
5.12 we can increase the hotel's ability to compete					
5.13 profits have increased because of EC					
5.14 we can increase productivity					
5.15 EC enhances the relationship with suppliers					

Compatibility

Question 6 The question below is about your perception of EC as consistent with existing values and past experiences.

My perception of the Compatibility of EC	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
6.1 EC is compatible with the business needs and values of the hotel					
6.2 EC is compatible with our customers' technology					

6.3 EC is compatible with our IT infrastructure					
6.4 EC is compatible with the activities adopted by our suppliers and partners					

Complexity

Question 7 The question below is about your perception of EC as relatively difficult to understand and use.

My Perception of the Complexity of EC	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
7.1 EC is complex when the hotel lacks appropriate tools					
7.2 EC is complex when the hotel staff lack expertise					
7.3 EC is complex when the company faces lack of industry standards					
7.4 EC is complex when the company faces lack of funding					

Section 2: ORGANISATIONAL CONTEXT

Size of hotel

Question 1 Please indicate your hotel ownership affiliation:

Chain	Independent	Other, please specify

Question 2 What is the approximate number of employees in your organisation? (At your site)

01-50	**51-100**	**101-150**	**151-200**	**Above 200**

Question 3 How many guest rooms does the hotel have?

01-50	**51-100**	**101-150**	**151 - 200**	**Over 200**

Question 4 **How many stars does your hotel have? (**As per the Tourism Council of SA)

___5 star ___4 star ___3 star ___2 star ___1 star ___not sure

Manager's IT Knowledge

Question 5 Please **tick** the following computer skills that you have.

Please indicate your Computing qualification and experience	Yes	No
2.5.1 I have attended computer classes		
2.5.2 I have formal qualifications in the use of and operation of a computer		
2.5.3 I use the Internet to gather information in my job		
2.5.4 I can use a database program (e.g. MS-Access/Excel to manage data)		
2.5.5 I can use Microsoft Word for my Report presentation to the Management		
2.5.6 I can use Microsoft Power Point for Report presentation		

Manager's Attitude

Question 6 The question below is about your attitude toward EC adoption.

Perception on Attitude to Use of EC	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
2.6.1 I seek out new ways of doing things					
2.6.2 I am involved in the adoption of new IT					
2.6.3 I am involved in the implementation of IT					
2.6.4 I like to take the lead in technology change					
2.6.5 I think the cost of implementing IT is too high					
2.6.6 I often find myself sceptical of new ideas					
2.6.7 I am receptive to new ideas					
2.6.8 I tend to feel that the old way of doing things is the best way					
2.6.9 I am reluctant about adopting new ways of doing things until I see them working for other people					

2.6.10 Training in IT is costly					
2.6.11 Maintenance of IT in hotels is costly					
2.6.12 I have to come up with my own original ideas of IT needed by the hotel					

Section 3: ENVIRONMENTAL CONTEXT

The questions below are about the situation of the hotel in the industry

Information Intensity

Question 1.

Information Intensity in the Hotel Industry	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
3.1.1 Information about our products and services is suitable for EC					
3.1.2 It is important for the hotel to access information quickly whenever we need it.					
3.1.3 Our products and services can easily be obtainable through EC					
3.1.4 The hotel is dependent on up to date information					

Competition

Question2

Competition: We should consider EC because of:	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
3.2.1 pressure from customers to use EC					
3.2.2 pressure from buyers to use EC					
3.2.3 pressure from suppliers to use EC					
3.2.4 vendors actively marketing EC					
3.2.5 rivalry in the business environment of the hotels					
3.2.6 customers switching to a competitor					

Section 4: THE EXTENT OF E- COMMERCE

The questions below are about the extent to which your hotel uses E-Commerce.

Please indicate your response by a **tick** to the answer that best indicates the extent of EC usage in the hotel:

Never = not used at all; **Rarely** = use once or twice a year; **Sometimes** = once a month

Regularly = several times a month; Always = use all the time

Business to Consumer (B2C) **Outbound Communication**	Never	Rarely	Sometimes	Regularly	Always
4.1 We provide customers with information about our company through the web sites					
4.2 We provide solutions to customers' problems					
4.3 We provide after-sales service to our customers					
4.4 When placing an order, customers can link to other places of interest e.g. game reserves					
4.5 Customers have access to online entertainment from our home page					

Business to Consumer (B2C) **Order Taking**	Never	Rarely	Sometimes	Regularly	Always
4.6 We accept bookings electronically					
4.7 We allow customers to track and inquire about their bookings electronically					
4.8 We accept payments electronically from customers					
4.9 We allow customers to check out electronically					

Business to Business (B2B) **Inbound Communication**	Never	Rarely	Sometimes	Regularly	Always
4.10 We share product and inventory planning information with our suppliers through e-mail					

web pages					
4.11 We permit suppliers to link up to our database through Enterprise Resource Planning					
4.12 We send suppliers regular updates about new developments of our company					
4.13 We provide specific online information about product specifications that our suppliers must meet through e-mail					

Business to Business (B2B) **Outbound Communication**	Never	Rarely	Sometimes	Regularly	Always
4.14 We search and locate potential suppliers on line					
4.15 We always place and track orders with suppliers electronically i.e. online order placement					
4.16 We use on line market places to source suppliers					
4.17 We allow suppliers to submit bids online					

Profile of Respondent

Please enter the following demographic information

Gender: Male Female

Age of Respondent

Less than 25 years	**25 – 35 years**	**36 – 45 years**	**46 – 55years**	**Above 55 years**

Rank/Position.

Years of Experience.

Qualification.

Add any other relevant information.

Thank you

UNIVERSITY OF KWAZULU-NATAL
School of Information Systems and Technology

PhD Research Project

Researcher: Nomsa Mndzebele (0767114659)

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Prof B McArthur (Ext. 5605)

Research Office: Ms P Ximba 031-2603587

CONSENT

I_____(full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project. I understand that I am at liberty to withdraw from the project at any time, should I so desire.

_____ _____

Signature of Participant **Date**

APPENDIX 2

List of Hotels used in the Pilot Study

1. Hotel Thistle
2. Redlands Hotel
3. Protea Hotel Imperial
4. Beach Hotel
5. Albany Hotel
6. Blue Waters
7. Beverly Hills Hotel
8. Holiday Inn Express Durban

APPENDIX 3: Factor Loading

Table 2.1. Factor loading for the manager's perception

	1	2	3	4
Relative Advantage 1	.746			
Relative Advantage 2	.726			
Relative Advantage 5.1	.578			
Relative Advantage 5.2	.717			
Relative Advantage 5.3	.697			
Relative Advantage 5.4	.519			
Relative Advantage 5.5	.650			
Relative Advantage 5.6	.533			
Relative Advantage 5.7	.595			
Relative Advantage 5.8	.575			
Relative Advantage 5.9	.622			
Relative Advantage 5.10	.621			
Relative Advantage 5.11	.528			
Relative Advantage 5.12	.524			
Relative Advantage 5.13	.612			
Relative Advantage 5.14	.649			
Relative Advantage 5.15	.676			
Compatibility		.749		
Compatibility		.732		
Compatibility		.762		

Compatibility		.707		
Complexity			.707	
Complexity			.828	
Complexity			.669	
Complexity			.746	
Attitude 1				.404
Attitude 2				.835
Attitude 3				.880
Attitude 4				.756
Attitude 5				.700
Attitude 6				.692
Attitude 7				.629
Attitude 8				.555
Attitude 9				.762
Attitude 10				.678
Attitude 11				.756
Attitude 12				.597

Table 2.2. Factor loading for the environmental factors

	1	2
Information intensity	.816	
Information intensity	.812	
Information intensity	.821	
Information intensity	.732	
Competition		.844
Competition		.753
Competition		.823
Competition		.568
Competition		.617
Competition		.627

Factor loading for the extent of EC adoption	**1**	**2**	**3**	**4**
B2C outbound	.679			
B2C outbound	.512			
B2C outbound	.601			
B2C outbound	.700			
B2C outbound	.536			
B2C order taking		.632		
B2C order taking		.854		
B2C order taking		.598		

B2C order taking		.591		
B2B inbound			.677	
B2B inbound			.705	
B2B inbound			.663	
B2B inbound			.504	
B2B outbound				.715
B2B outbound				.809
B2B outbound				.847
B2B outbound				.619

APPENDIX 4: MANOVA for all the Variables

Relative advantage

B2C Outbound Communication

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.358(a)	.128	.073	3.70284	.128	2.312	17	268	.003

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	538.811	17	31.695	2.312	.003(a)
	Residual	3674.564	268	13.711		
	Total	4213.374	285			

Table C.1 Results of multiple linear regression analysis on relative Advantage

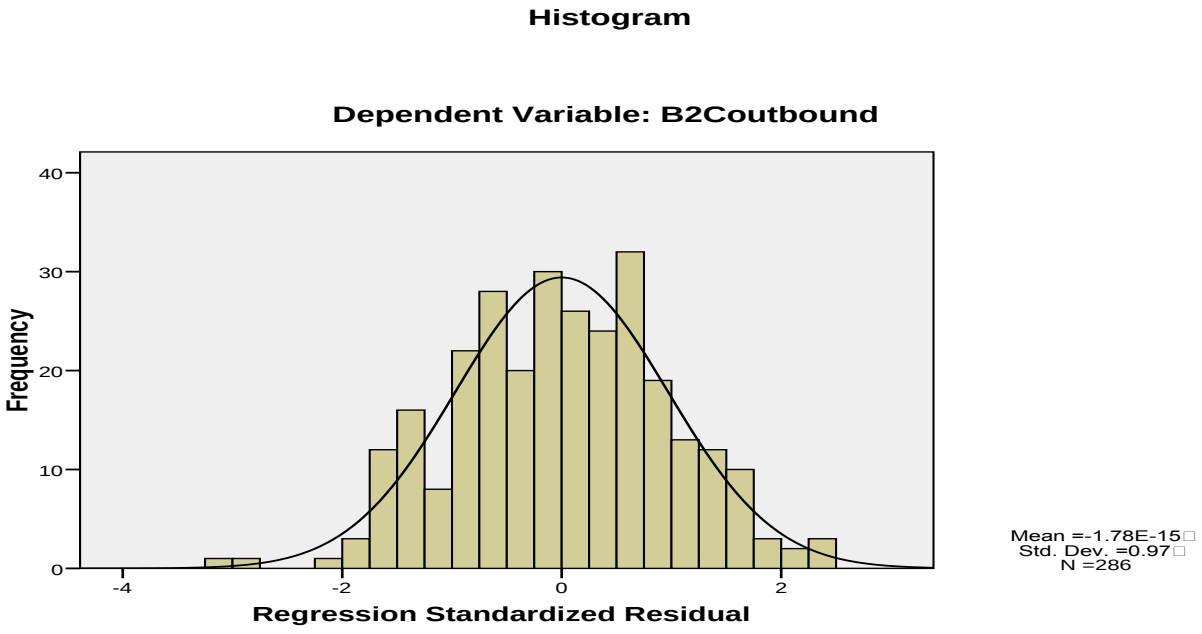

Figure C.5.1 Histogram showing frequency of Regression Standardised with Relative Advantage

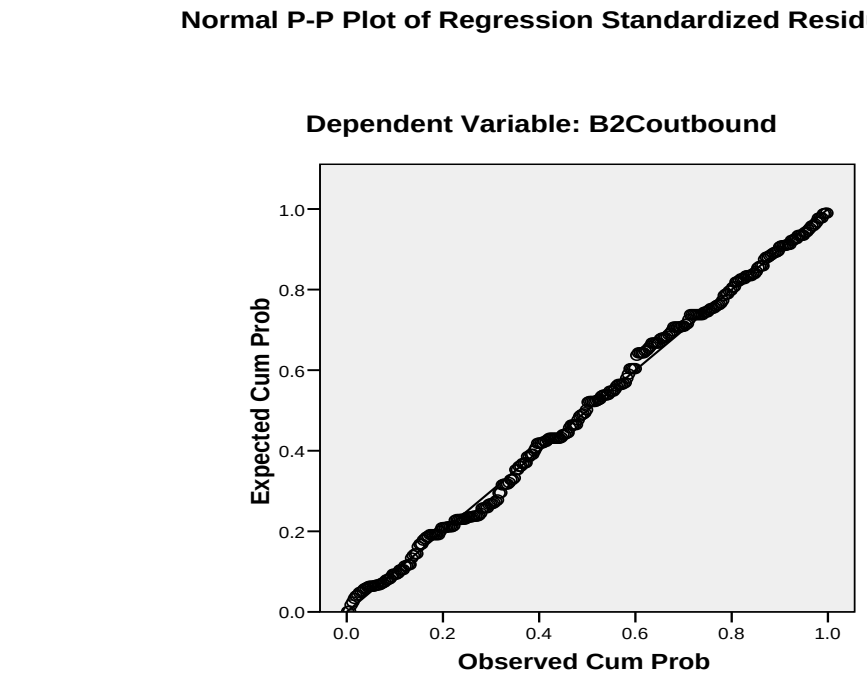

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Relative Advantage

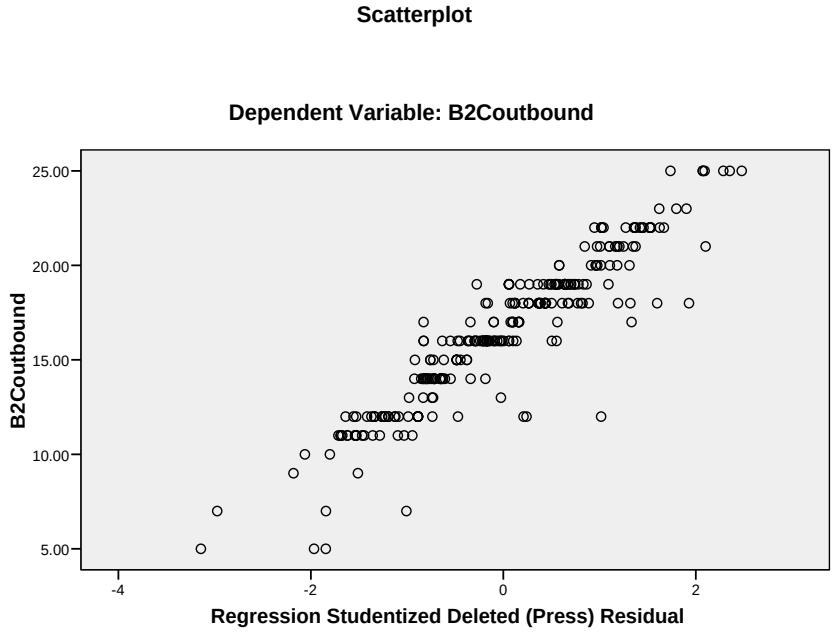

Figure C.5.3 Scatter plot of Regression Standardised Residual with Relative Advantage

B2C Order taking

Relative Advantage

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.429(a)	.184	.133	3.39013	.184	3.574	17	269	.000

The model used is only able to account for 43% of the variance in relative advantage. However the test statistics is very significant at the 0.05 level of significance, ($F_{17,\ }$)=3.574; p<0.000). It follows that the null hypothesis of equal means is rejected that is there are statistically significant differences among the means.

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	698.329	17	41.078	3.574	.000(a)
	Residual	3091.608	269	11.493		
	Total	3789.937	286			

Table C.1 Results of multiple linear regression analysis on relative Advantage

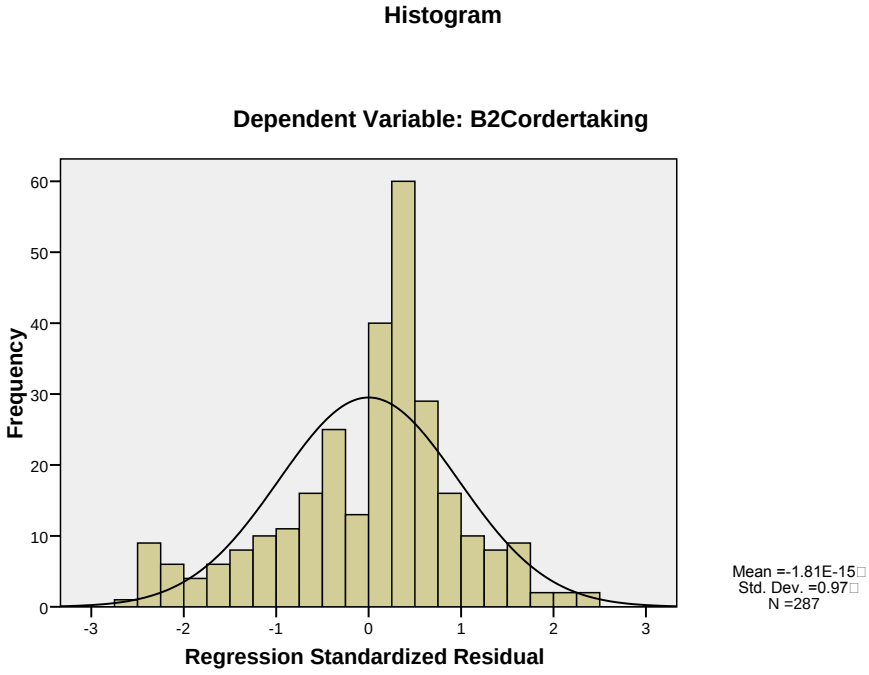

Figure C.5.1 Histogram showing frequency of Regression Standardised with Relative Advantage

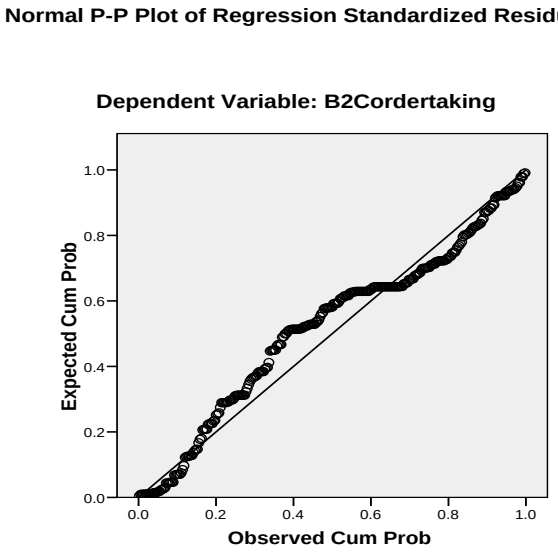

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Relative Advantage

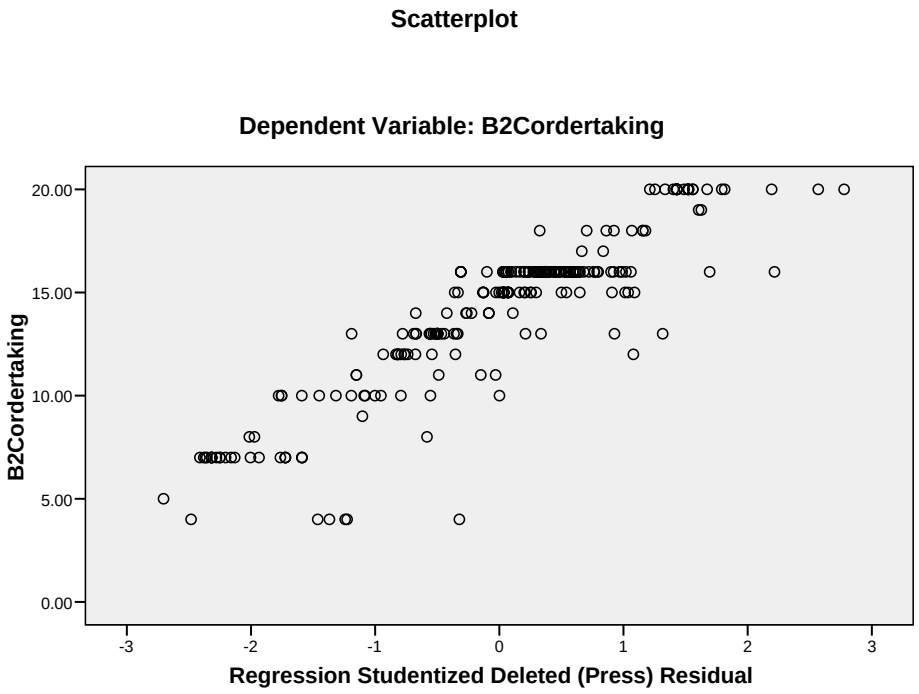

Figure C.5.3 Scatter plot of Regression Standardised Residual with Relative Advantage

B2B INBOUND COMMUNICATION

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.317(a)	.101	.044	4.29135

The model used is only able to account for 32% of the variance in relative advantage. However the test statistics is very significant at the 0.05 level of significance, ($F_{17,\ }$)=1.766; p<0.032). It follows that the null hypothesis of equal means is rejected that is there are statistically significant differences among the means.

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	553.001	17	32.529	1.766	.032(a)
	Residual	4935.405	268	18.416		
	Total	5488.406	285			

Table C.1 Results of multiple linear regression analysis on relative Advantage

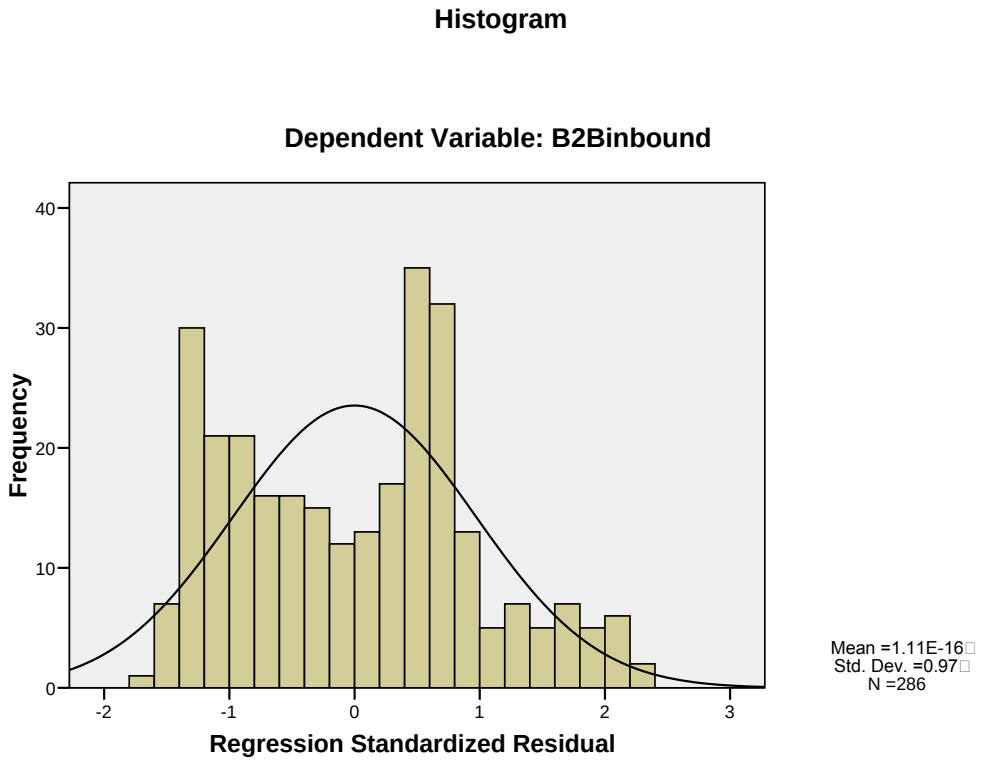

Figure C.5.1 Histogram showing frequency of Regression Standardised with Relative Advantage

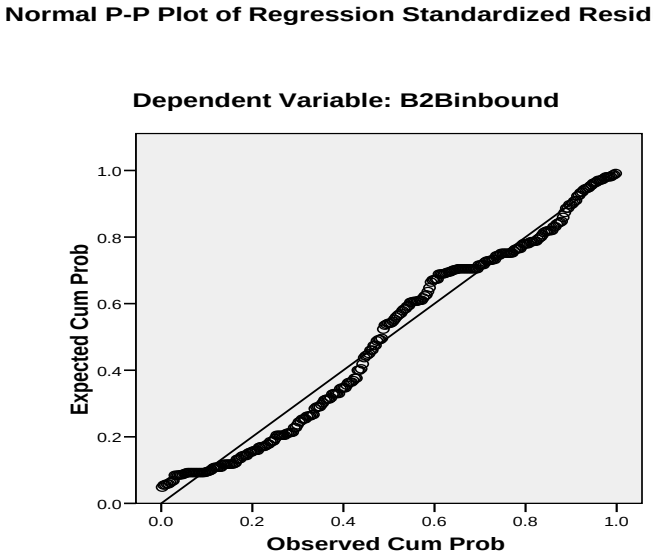

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Relative Advantage

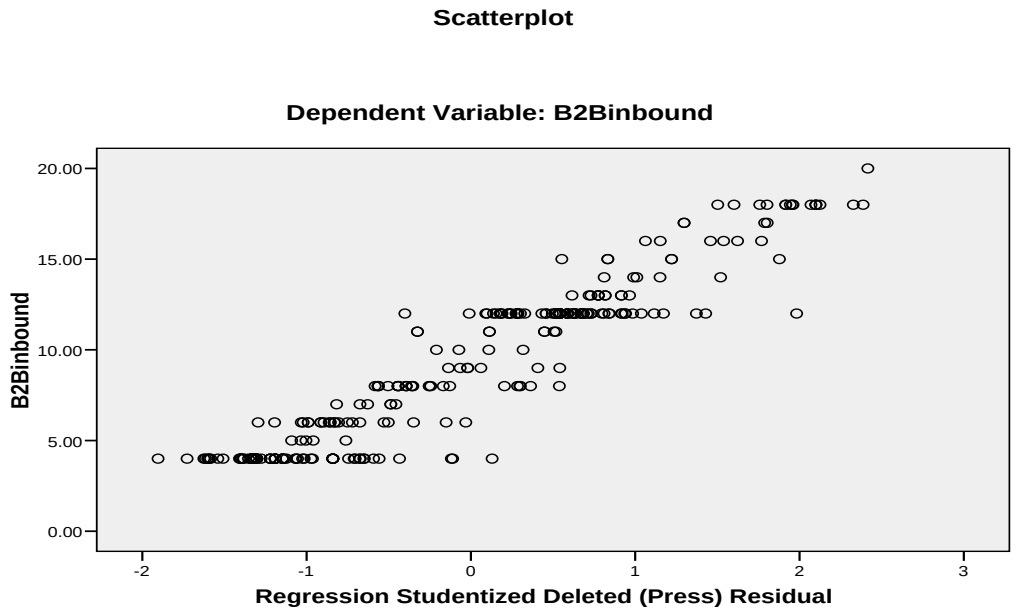

Figure C.5.3 Scatter plot of Regression Standardised Residual with Relative Advantage

B2B OUTBOUND

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.458(a)	.210	.158	3.94713

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1069.144	17	62.891	4.037	.000(a)
	Residual	4019.592	258	15.580		
	Total	5088.736	275			

Table C.1 Results of multiple linear regression analysis on relative Advantage

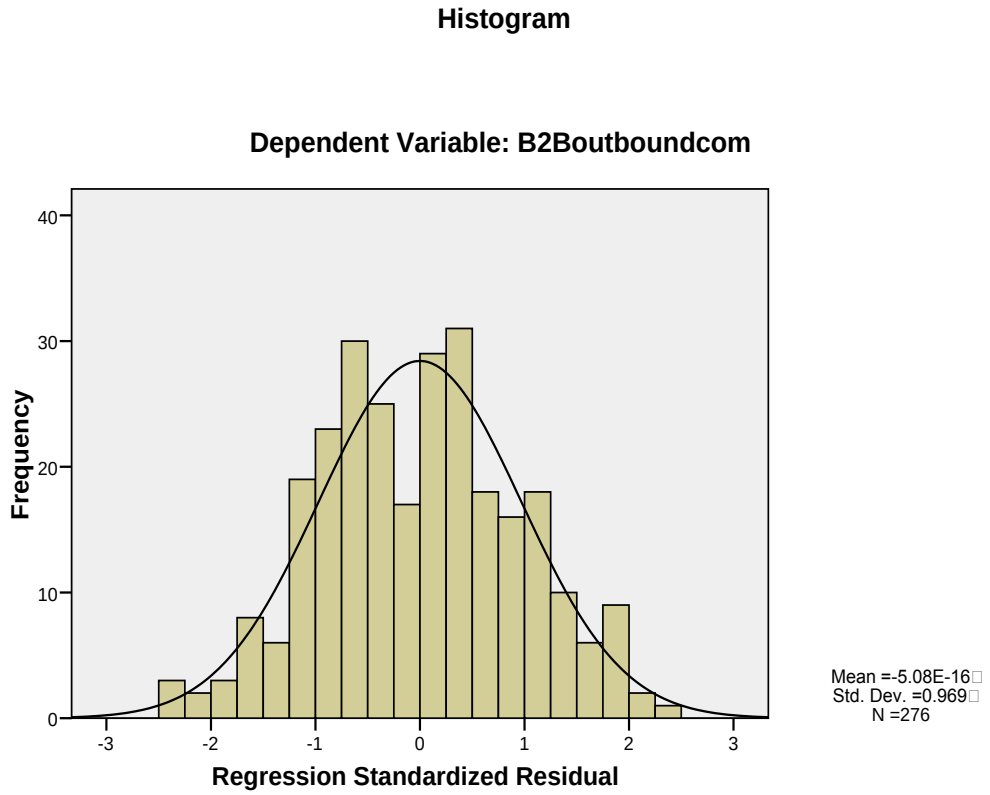

Figure C.5.1 Histogram showing frequency of Regression Standardised with Relative Advantage

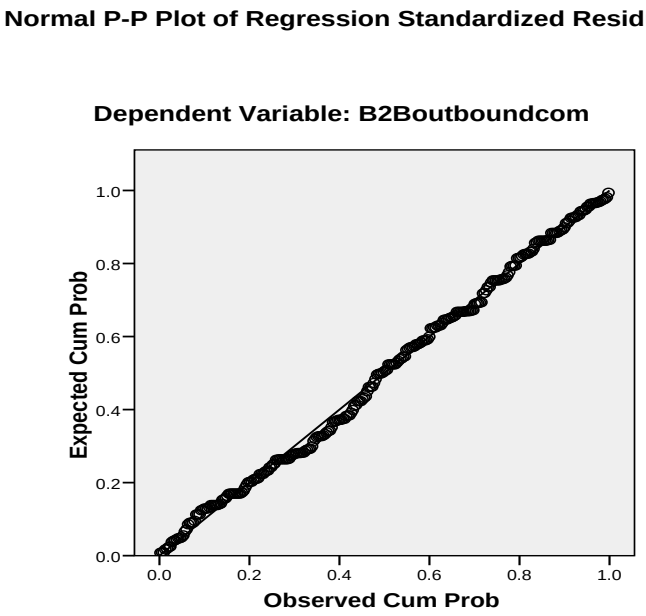

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Relative Advantage

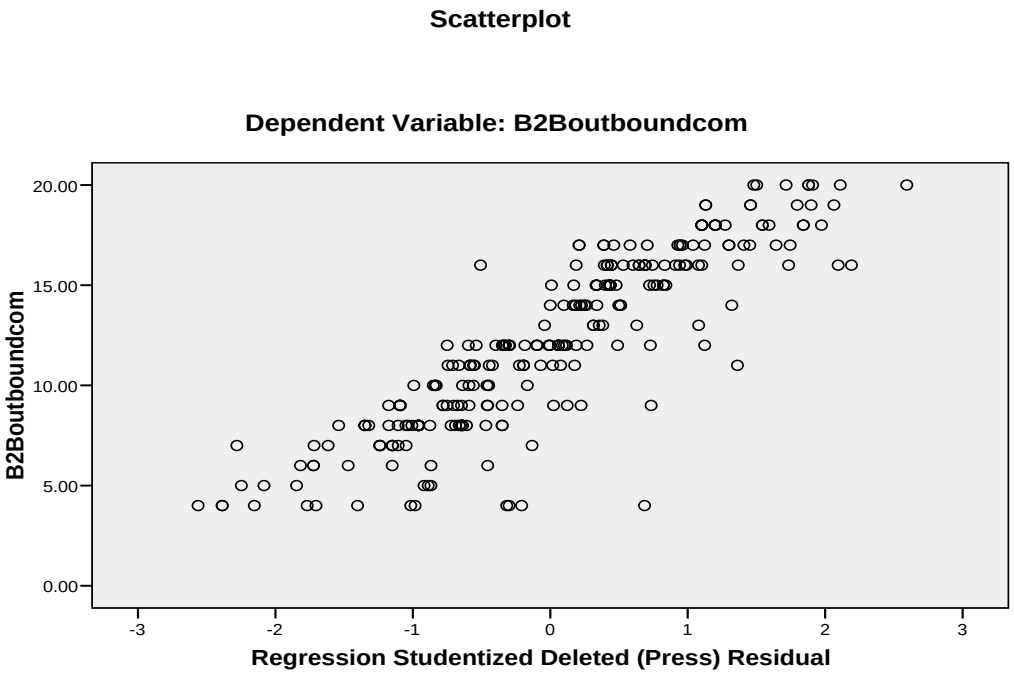

Figure C.5.3 Scatterplot of Regression Standardised Residual with Relative Advantage

COMPATIBILITY

B2C OUTBOUND

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.191(a)	.036	.024	3.84751	.036	2.906	4	307	.022

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	172.086	4	43.021	2.906	.022(a)
	Residual	4544.632	307	14.803		
	Total	4716.718	311			

Table C.1 Results of multiple linear regression analysis on compatibility

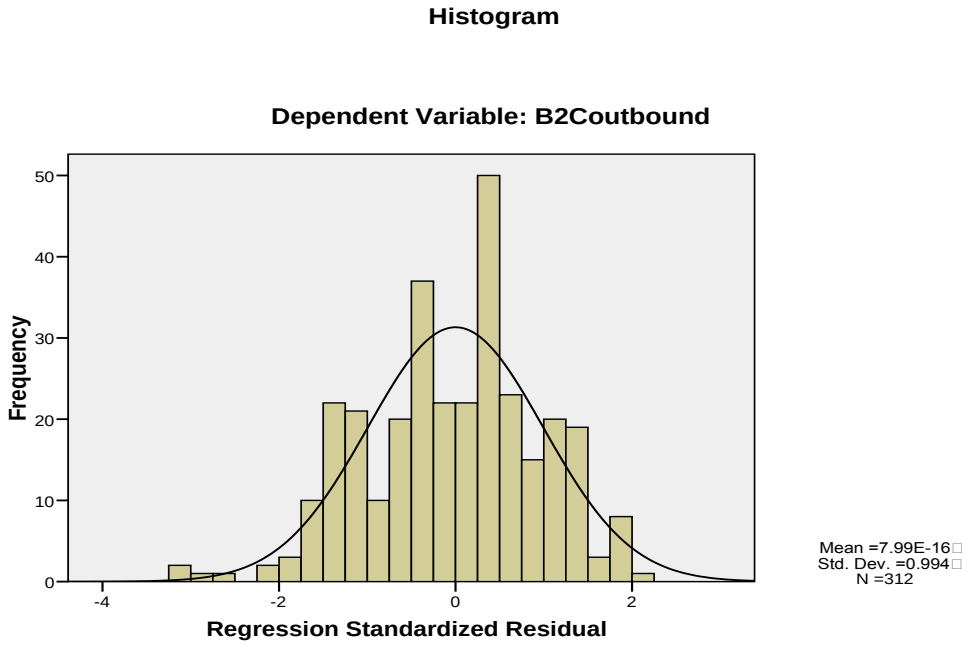

Figure C.5.1 Histogram showing frequency of Regression Standardised with Compatibility

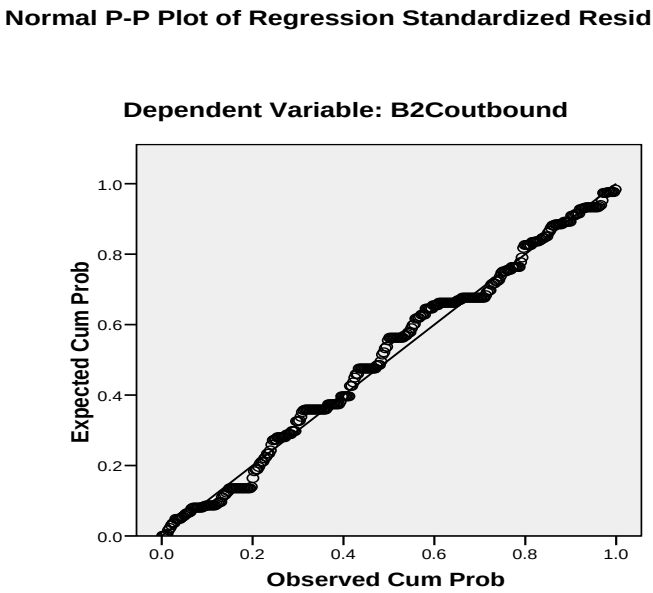

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Compatibility

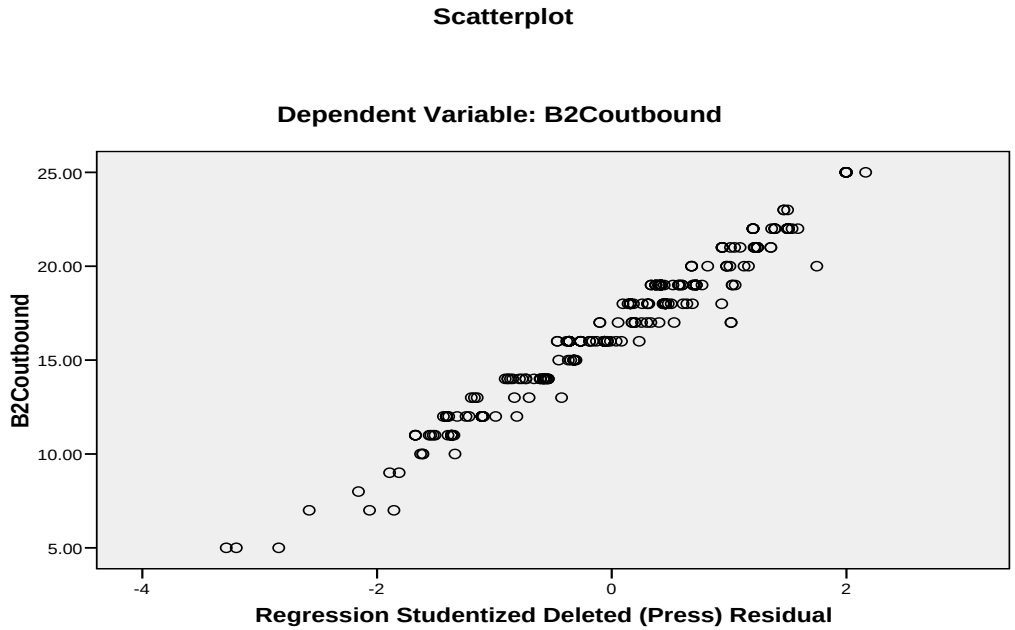

Figure C.5.3 Scatter plot of Regression Standardised Residual with Compatibility

B2C ORDER TAKING

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.197(a)	.039	.026	3.53272	.039	3.108	4	308	.016

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	155.165	4	38.791	3.108	.016(a)
	Residual	3843.864	308	12.480		
	Total	3999.029	312			

Table C.1 Results of multiple linear regression analysis on compatibility

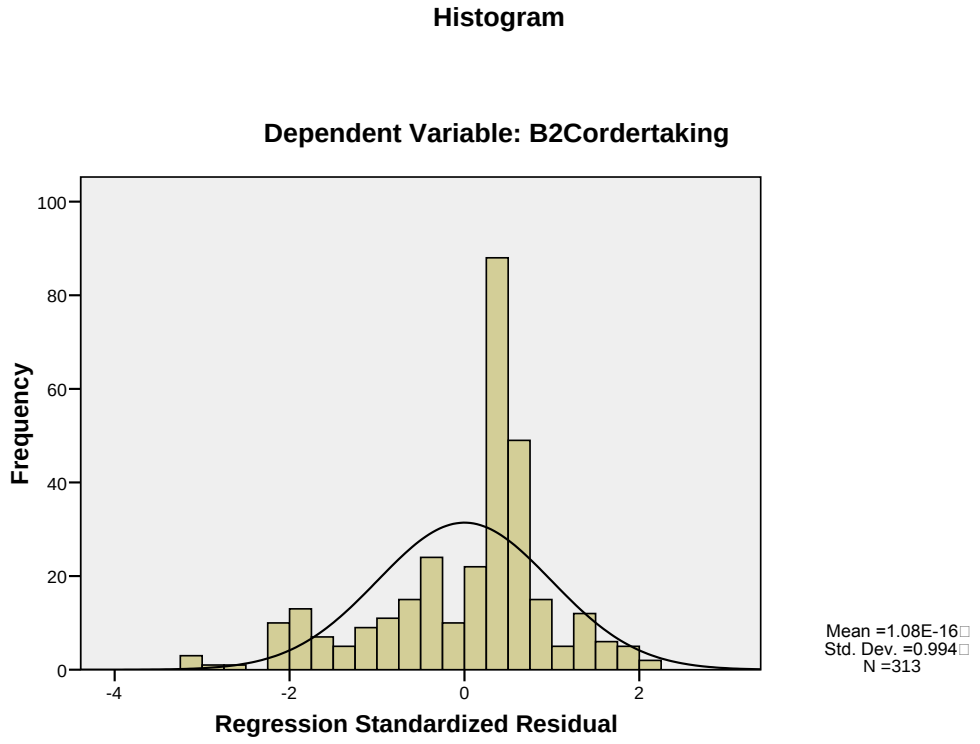

Figure C.5.1 Histogram showing frequency of Regression Standardised with Compatibility

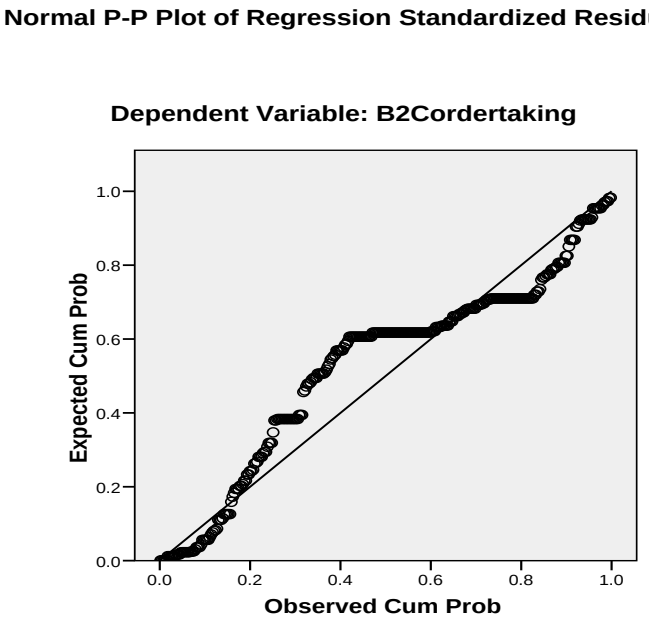

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Compatibility

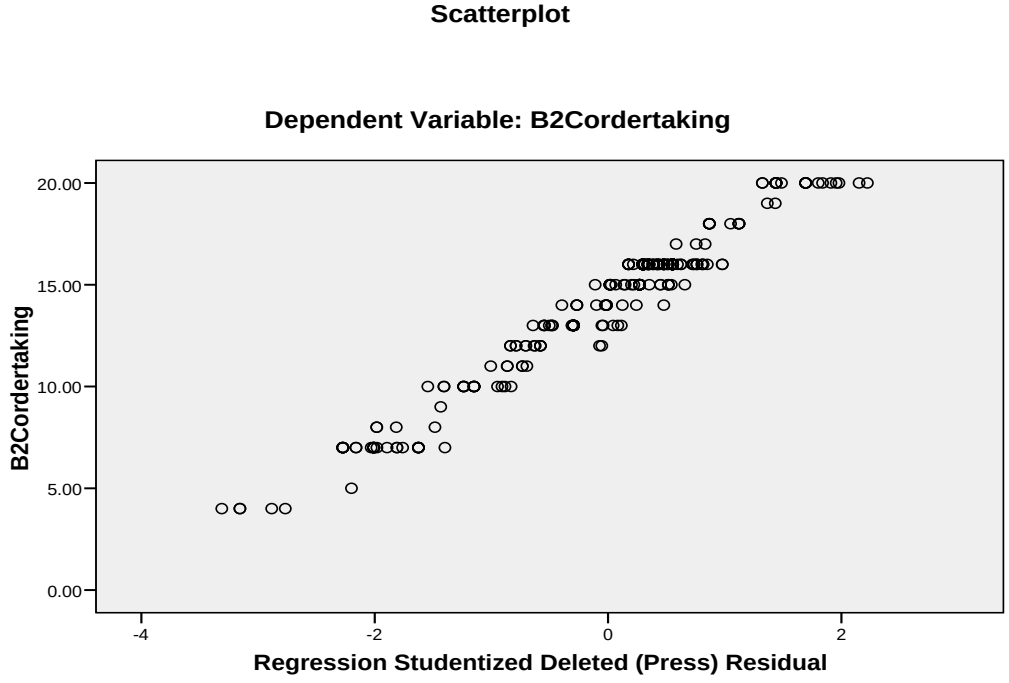

Figure C.5.3 Scatter plot of Regression Standardised Residual with Compatibility

B2B INBOUND

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.164(a)	.027	.014	4.34298

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	158.019	4	39.505	2.094	.081(a)
	Residual	5752.755	305	18.861		
	Total	5910.774	309			

Table C.1 Results of multiple linear regression analysis on compatibility

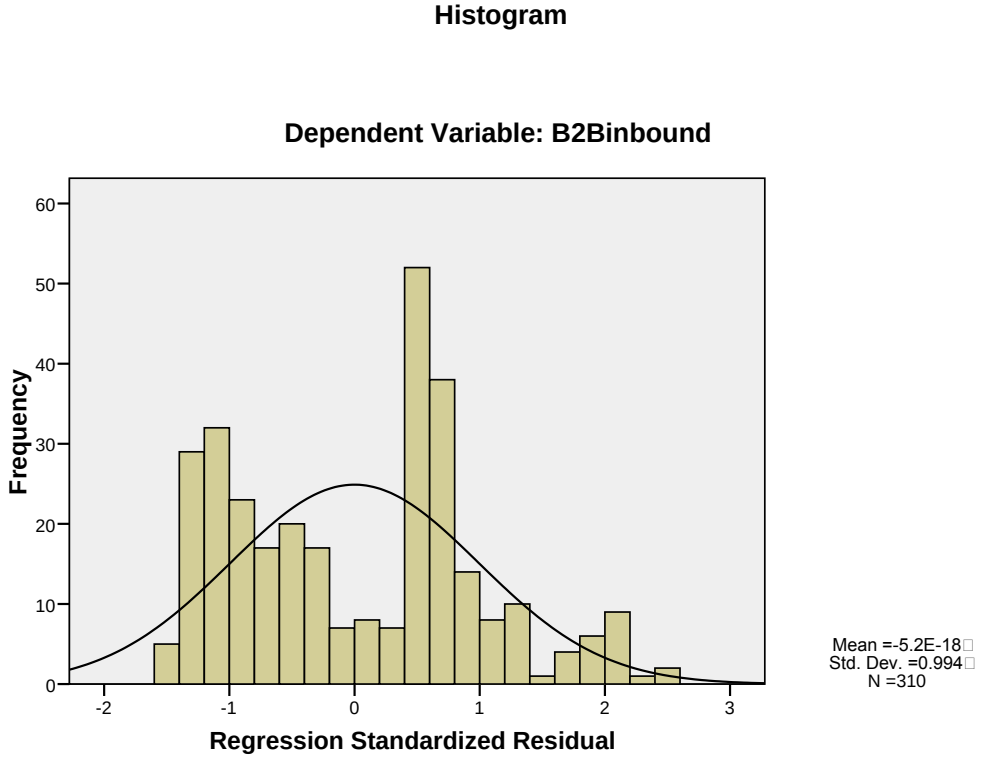

Figure C.5.1 Histogram showing frequency of Regression Standardised with Compatibility

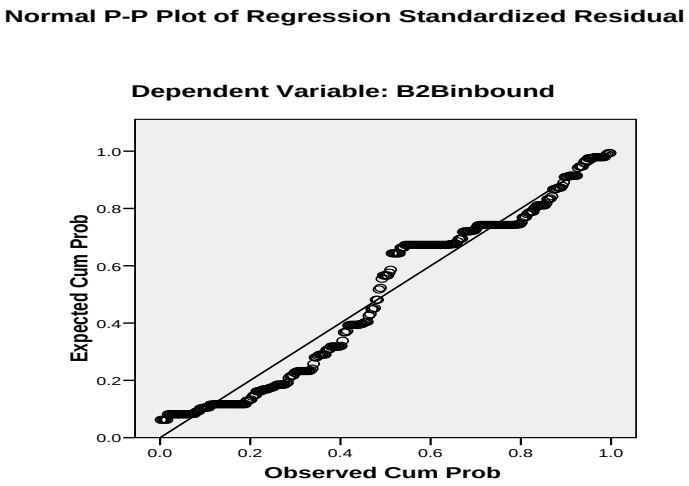

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Compatibility

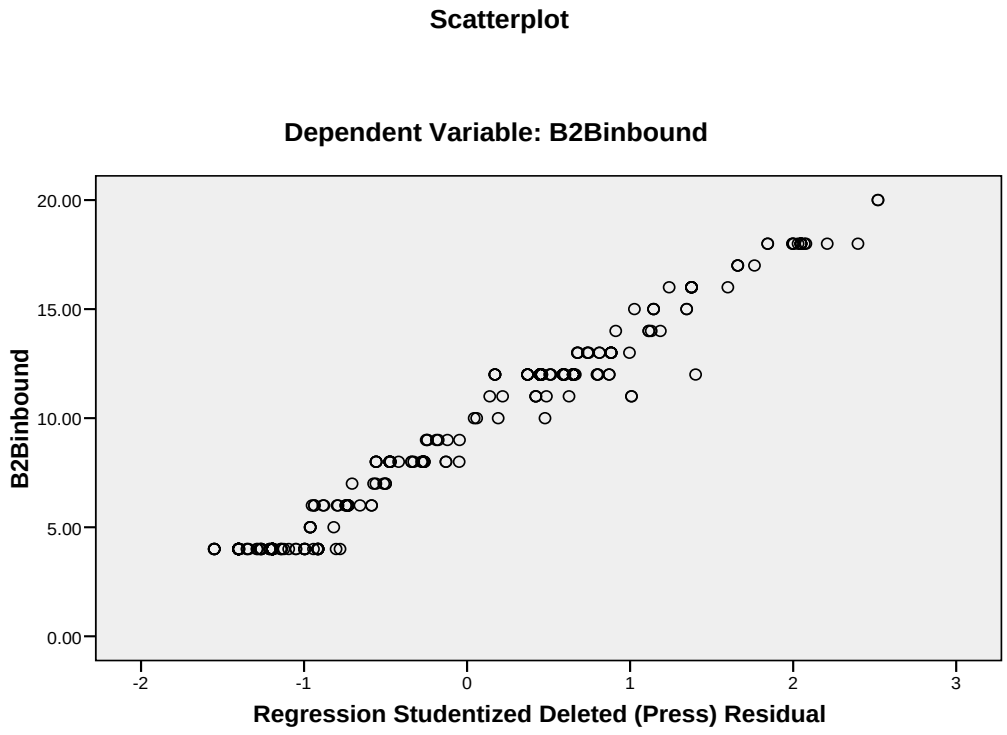

Figure C.5.3 Scatter plot of Regression Standardised Residual with Compatibility

B2B OUTBOUND

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.314(a)	.099	.086	4.17598

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	560.290	4	140.072	8.032	.000(a)
	Residual	5127.014	294	17.439		
	Total	5687.304	298			

Table C.1 Results of multiple linear regression analysis on compatibility

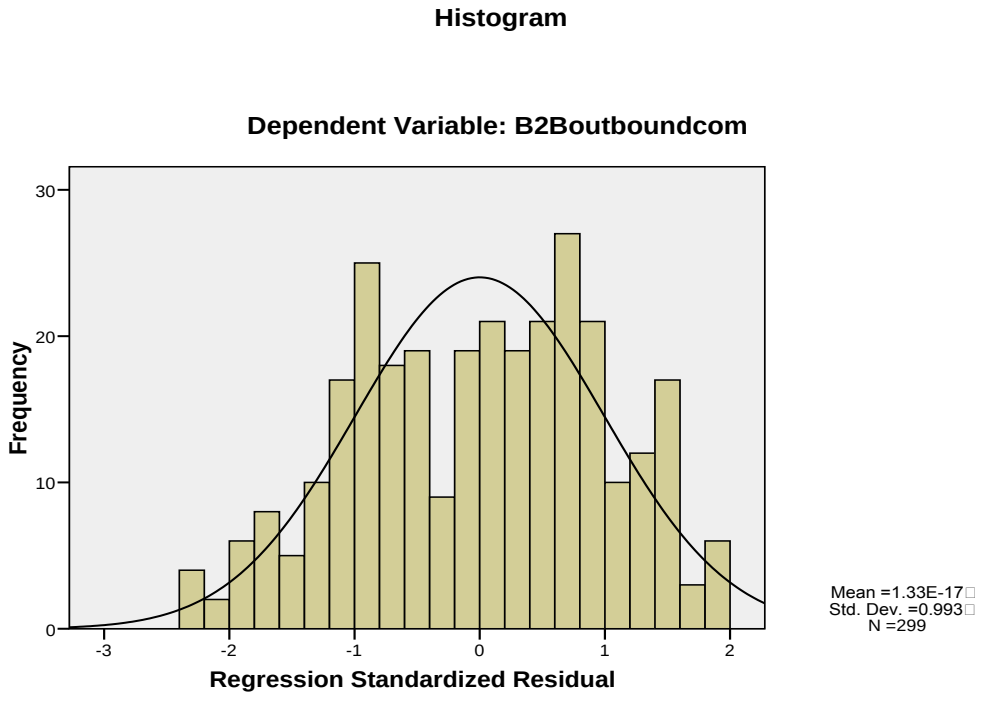

Figure C.5.1 Histogram showing frequency of Regression Standardised with Compatibility

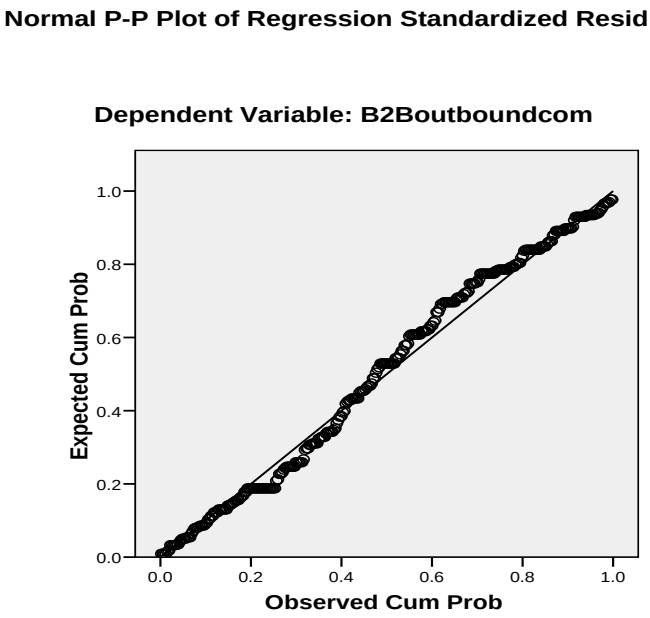

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Compatibility

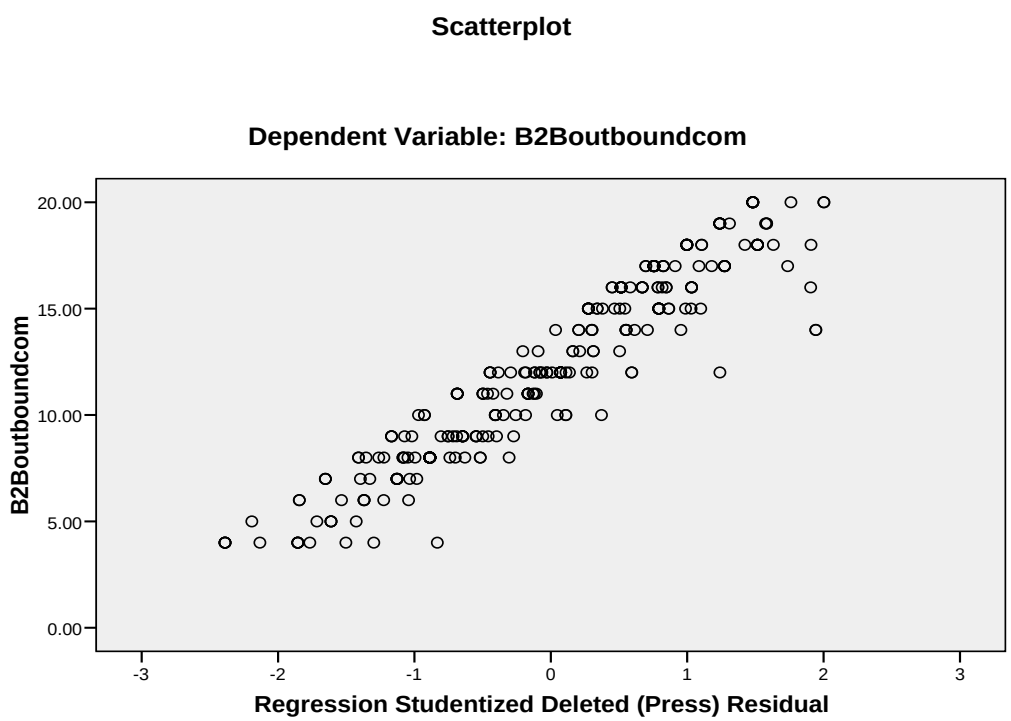

Figure C.5.3 Scatter plot of Regression Standardised Residual with Compatibility

COMPLEXITY

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.316(a)	.100	.089	3.66869	.100	8.923	4	321	.000

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	480.392	4	120.098	8.923	.000(a)
	Residual	4320.443	321	13.459		
	Total	4800.834	325			

Table C.1 Results of multiple linear regression analysis on Complexity

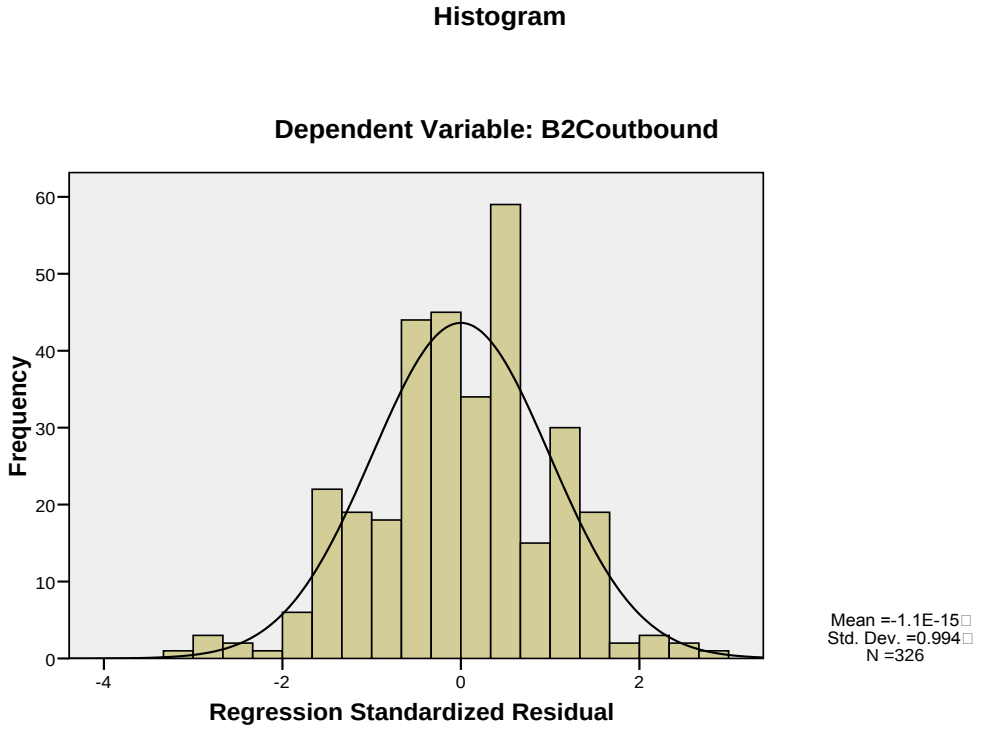

Figure C.5.1 Histogram showing frequency of Regression Standardised with Complexity

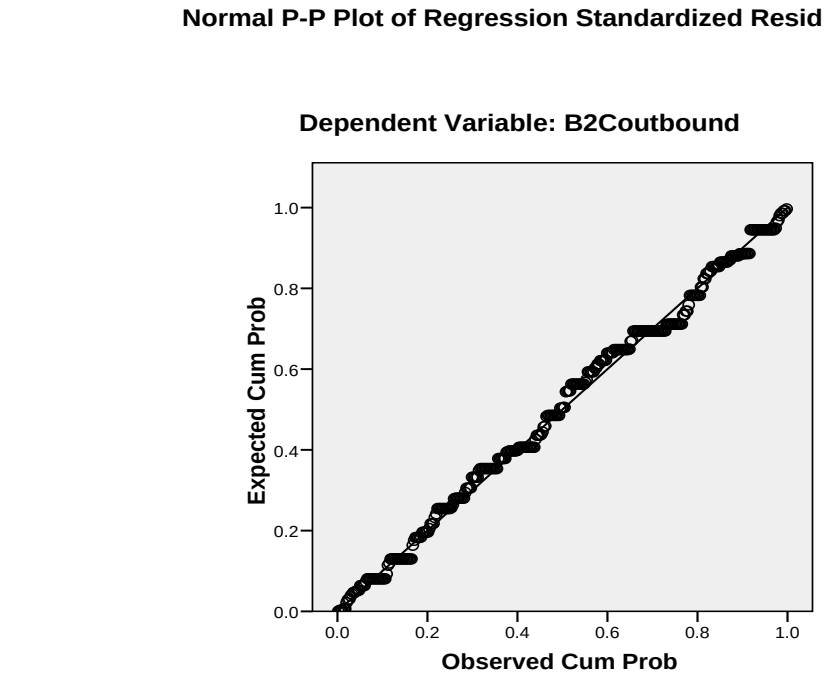

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Complexity

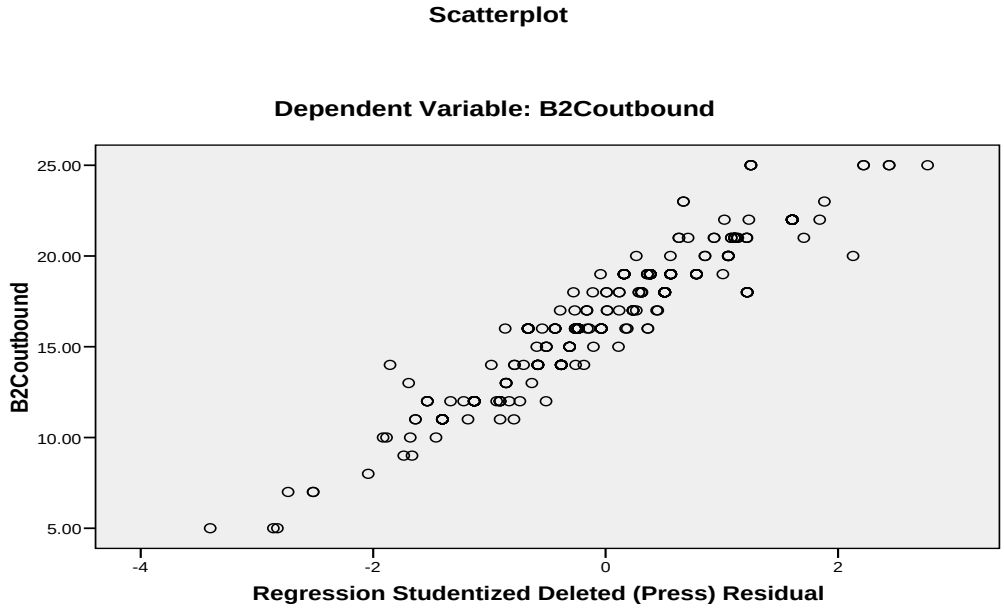

Figure C.5.3 Scatter plot of Regression Standardised Residual with Complexity

B2C ORDER TAKING

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.376(a)	.141	.130	3.37471	.141	13.222	4	322	.000

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	602.329	4	150.582	13.222	.000(a)
	Residual	3667.145	322	11.389		
	Total	4269.474	326			

Table C.1 Results of multiple linear regression analysis on Complexity

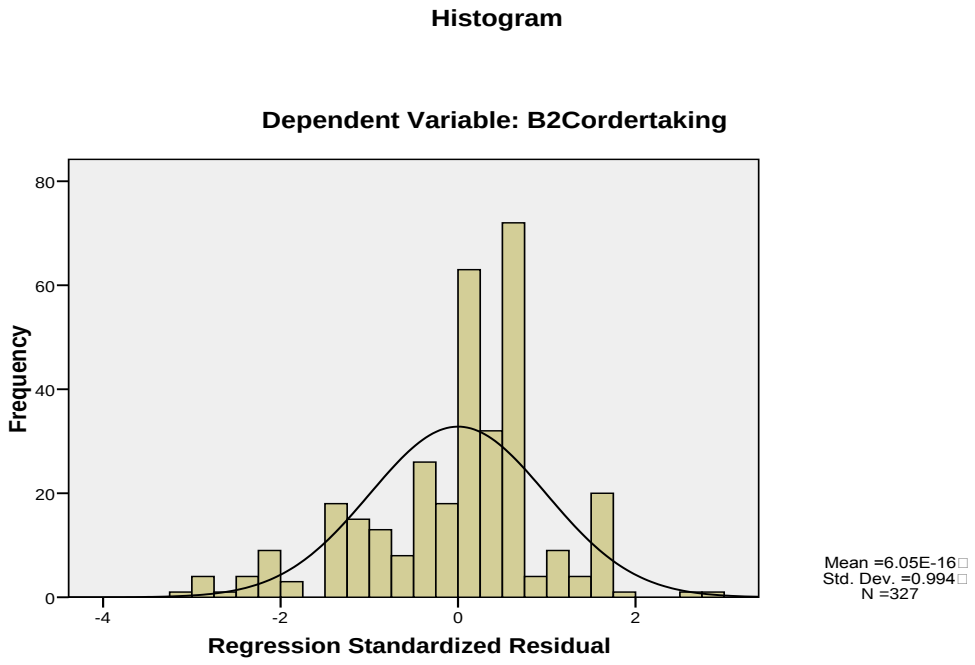

Figure C.5.1 Histogram showing frequency of Regression Standardised with Complexity

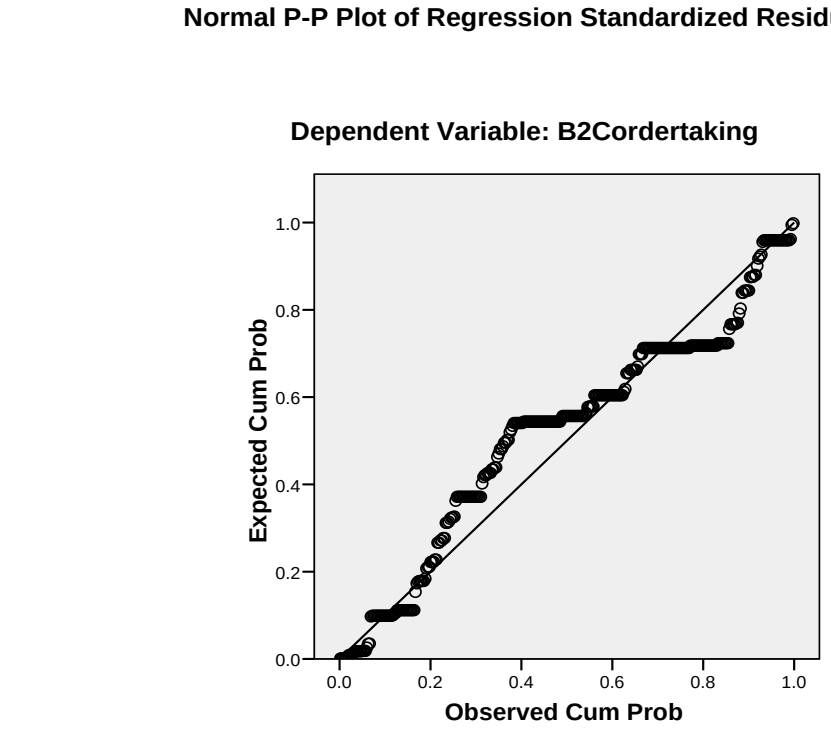

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Complexity

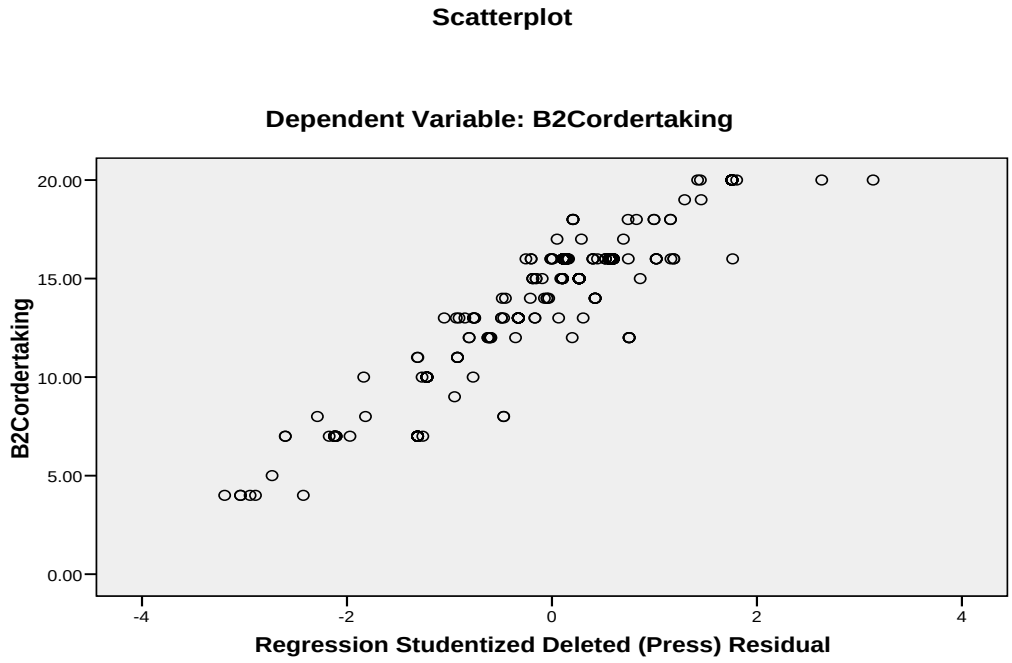

Figure C.5.3 Scatter plot of Regression Standardised Residual with Complexity

B2B INBOUND

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.389(a)	.151	.140	4.01779

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	913.325	4	228.331	14.145	.000(a)
	Residual	5133.362	318	16.143		
	Total	6046.687	322			

Table C.1 Results of multiple linear regression analysis on Complexity

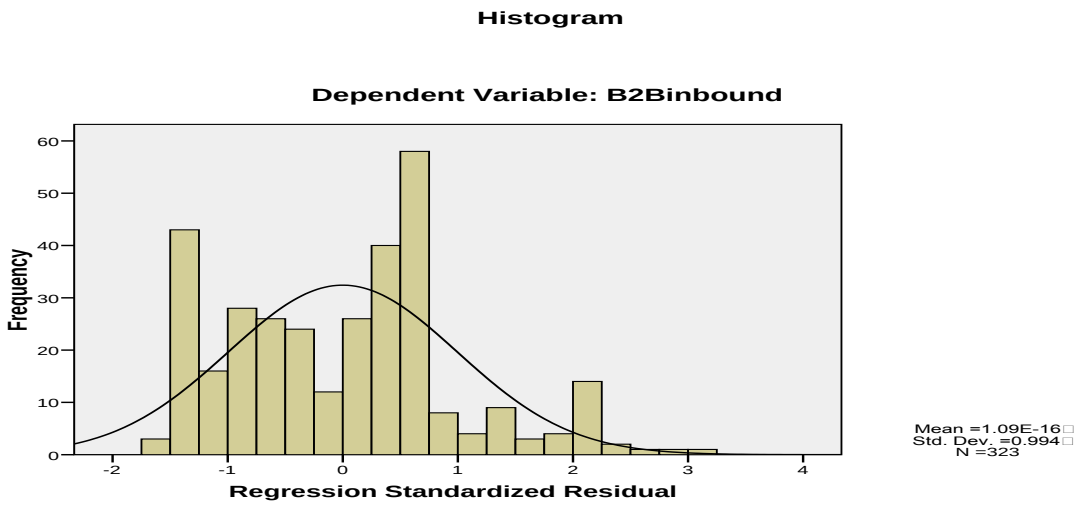

Figure C.5.1 Histogram showing frequency of Regression Standardised with Complexity

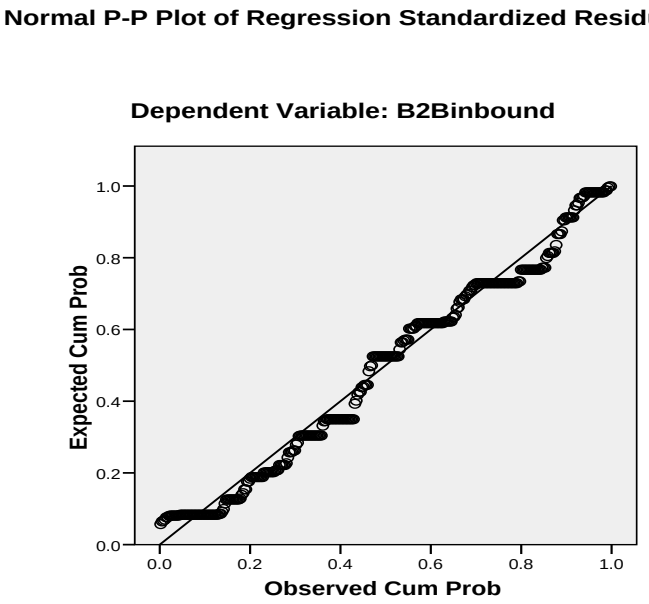

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Complexity

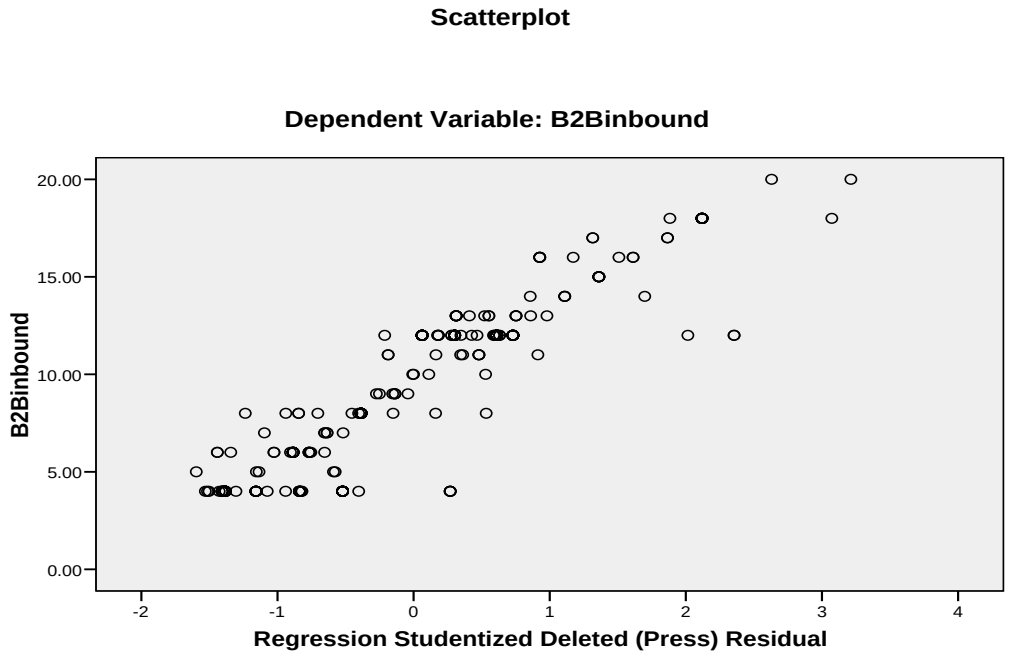

Figure C.5.3 Scatter plot of Regression Standardised Residual with Complexity

B2B OUTBOUND

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.413(a)	.171	.160	4.01337

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1014.158	4	253.540	15.741	.000(a)
	Residual	4928.794	306	16.107		
	Total	5942.952	310			

Table C.1 Results of multiple linear regression analysis on Complexity

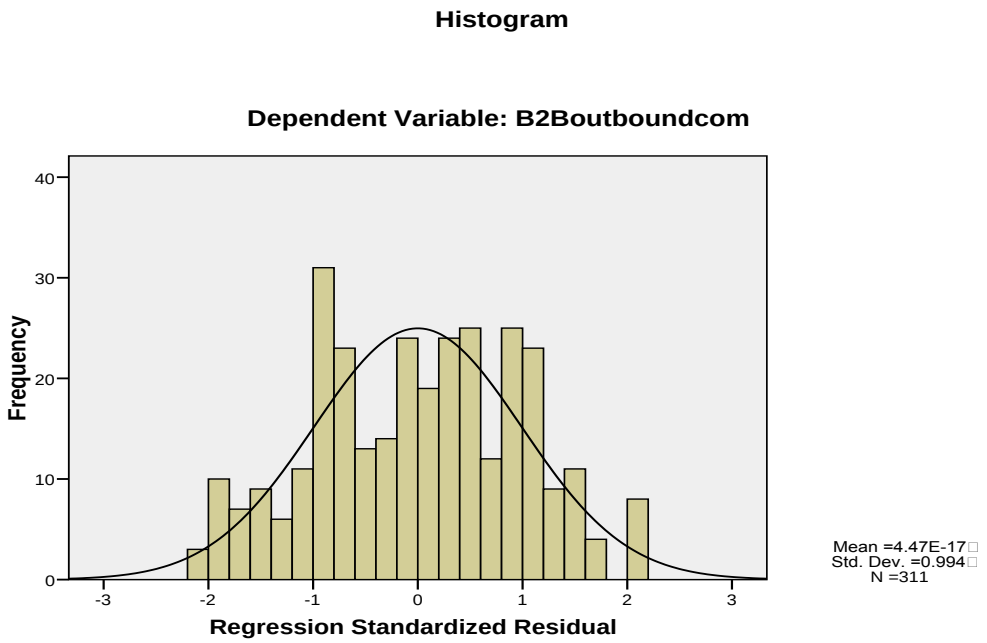

Figure C.5.1 Histogram showing frequency of Regression Standardised with Complexity

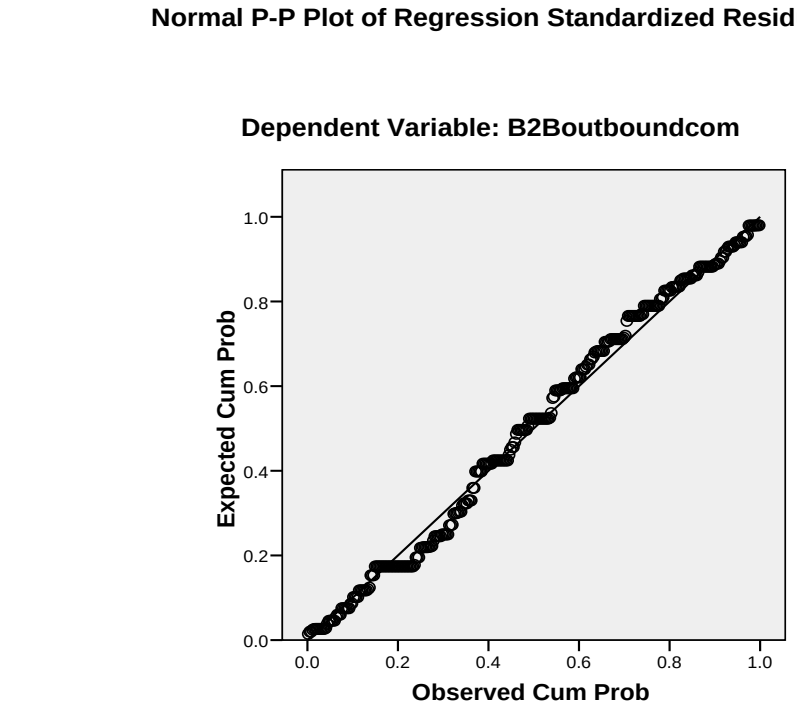

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Complexity

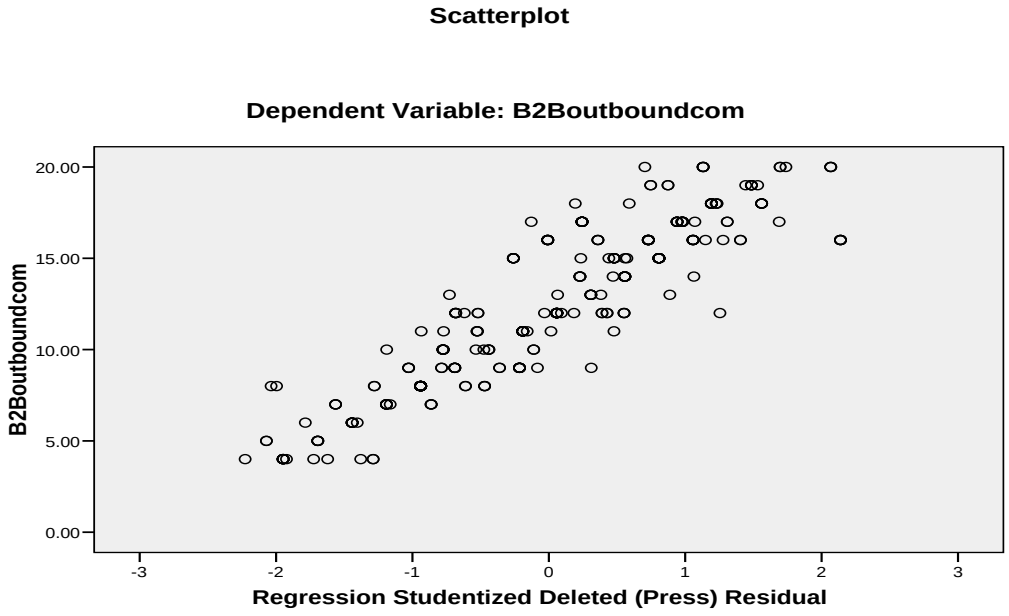

Figure C.5.3 Scatterplot of Regression Standardised Residual with Complexity

MANAGERS' ATTITUDE

B2C OUTBOUND

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.499(a)	.249	.219	3.32103	.249	8.281	12	300	.000

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1095.954	12	91.329	8.281	.000(a)
	Residual	3308.781	300	11.029		
	Total	4404.735	312			

Table C.1 Results of multiple linear regression analysis on managers attitude

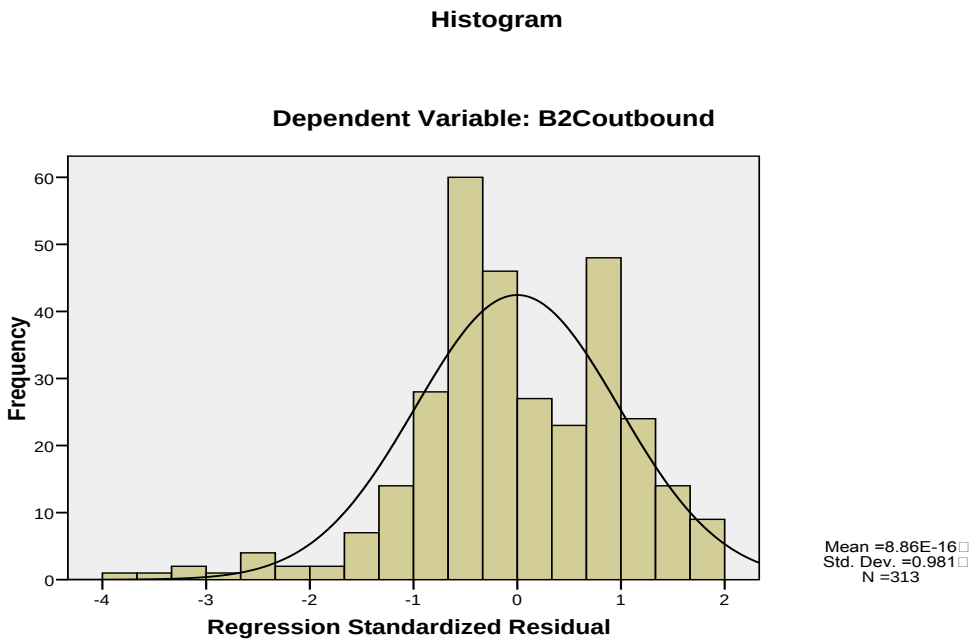

Figure C.5.1 Histogram showing frequency of Regression Standardised with Managers Attitude

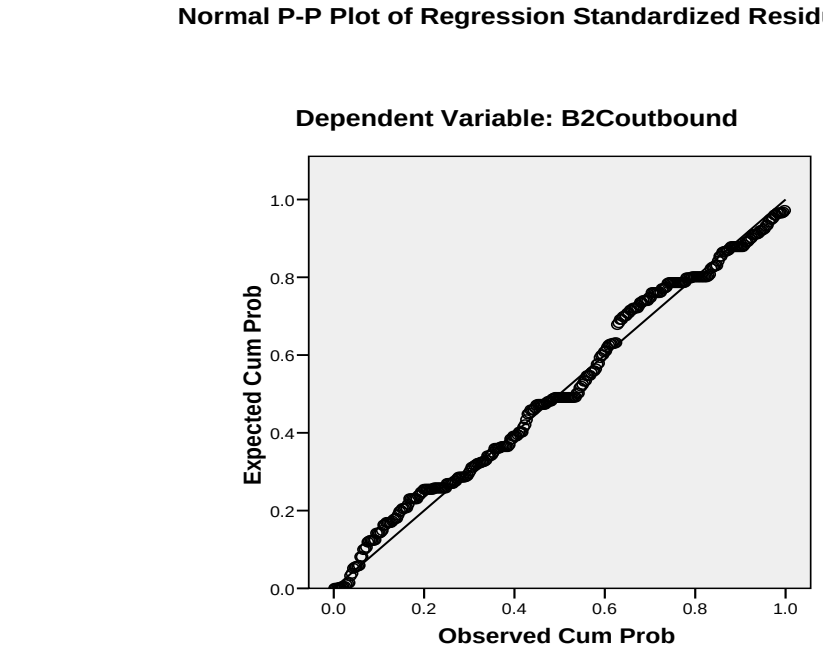

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Managers Attitude

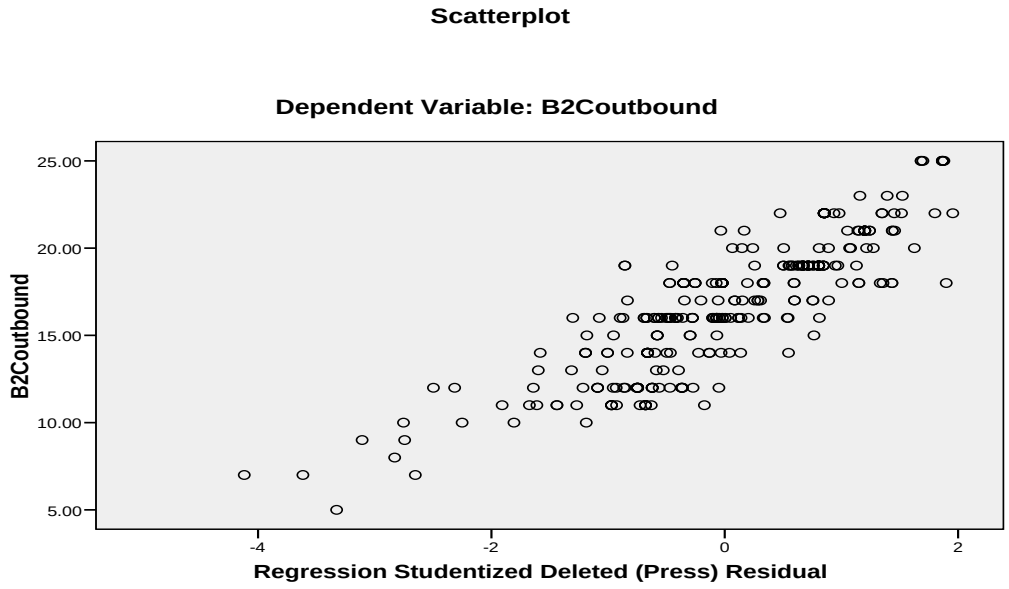

Figure C.5.3 Scatter plot of Regression Standardised Residual with Managers Attitude

B2C ORDERTAKING

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.396(a)	.157	.124	3.29835	.157	4.678	12	301	.000

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	610.728	12	50.894	4.678	.000(a)
	Residual	3274.610	301	10.879		
	Total	3885.338	313			

Table C.1 Results of multiple linear regression analysis on managers attitude

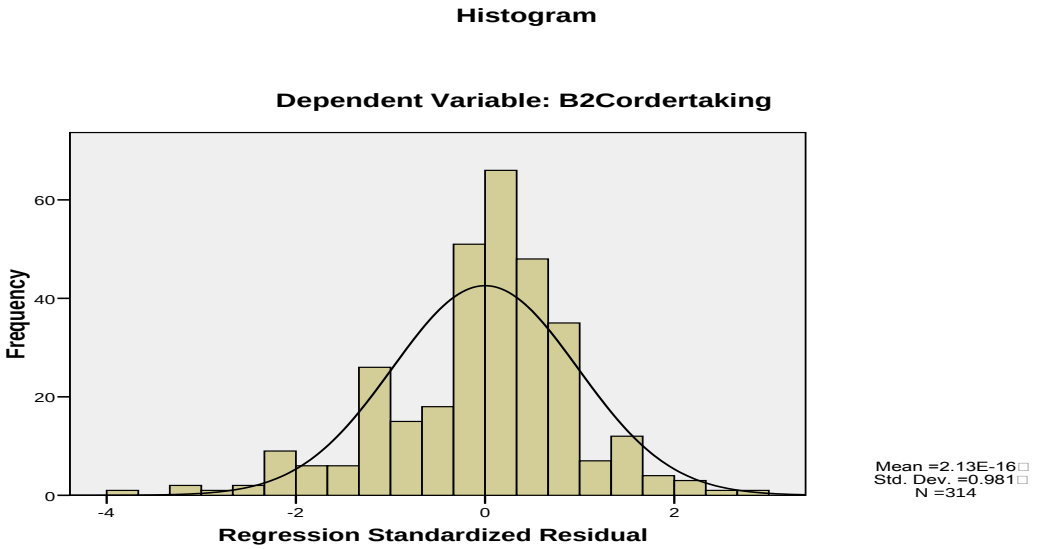

Figure C.5.1 Histogram showing frequency of Regression Standardised with Managers Knowledge

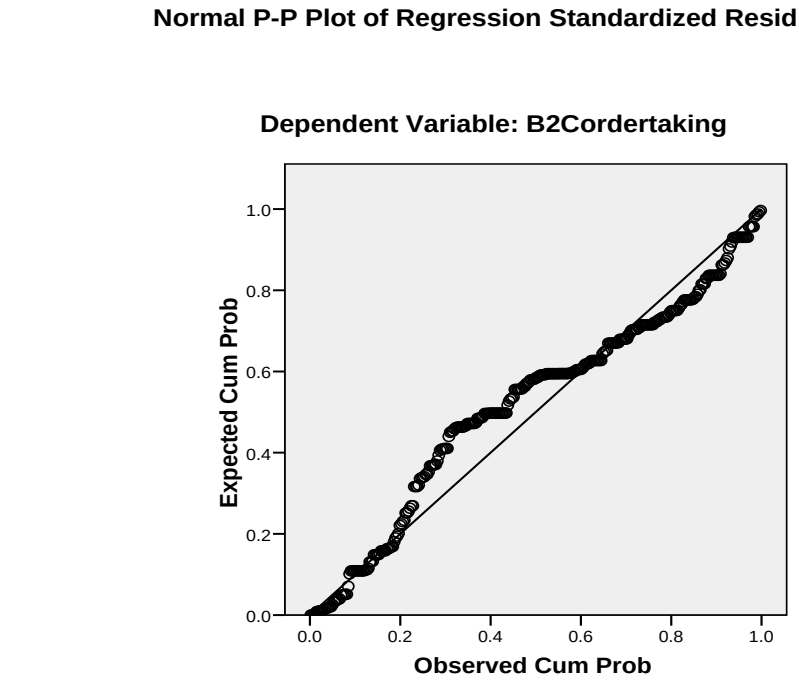

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Managers Attitude

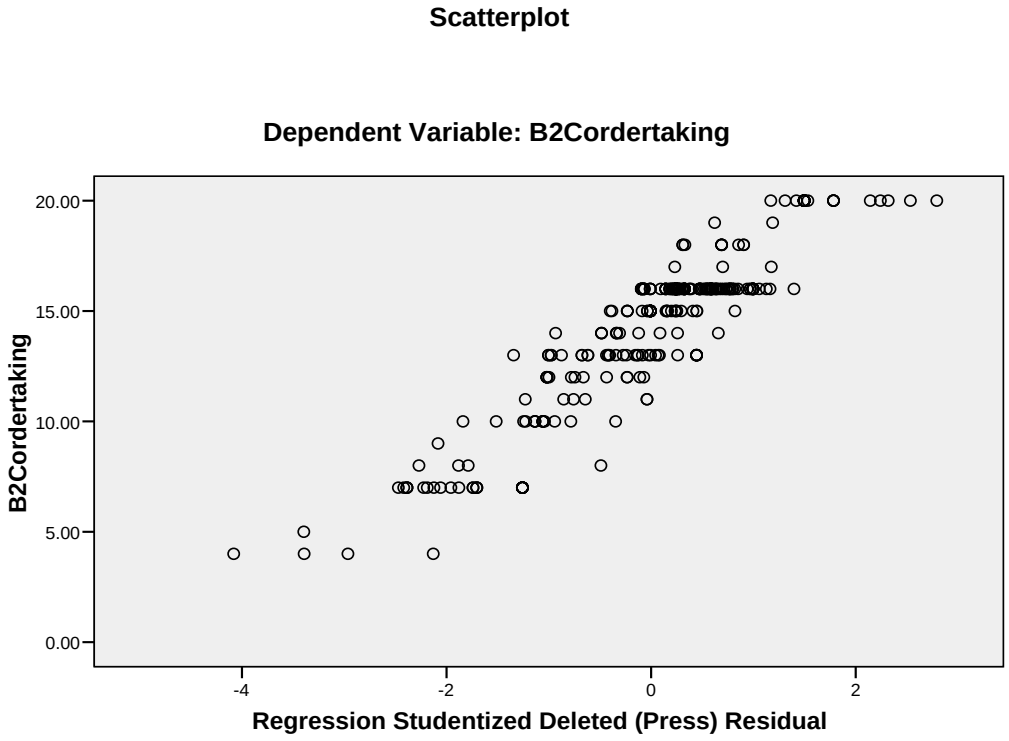

Figure C.5.3 Scatter plot of Regression Standardised Residual with Managers Attitude

B2B INBOUND

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.533(a)	.284	.256	3.71144

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1626.341	12	135.528	9.839	.000(a)
	Residual	4091.108	297	13.775		
	Total	5717.448	309			

Table C.1 Results of multiple linear regression analysis on managers attitude

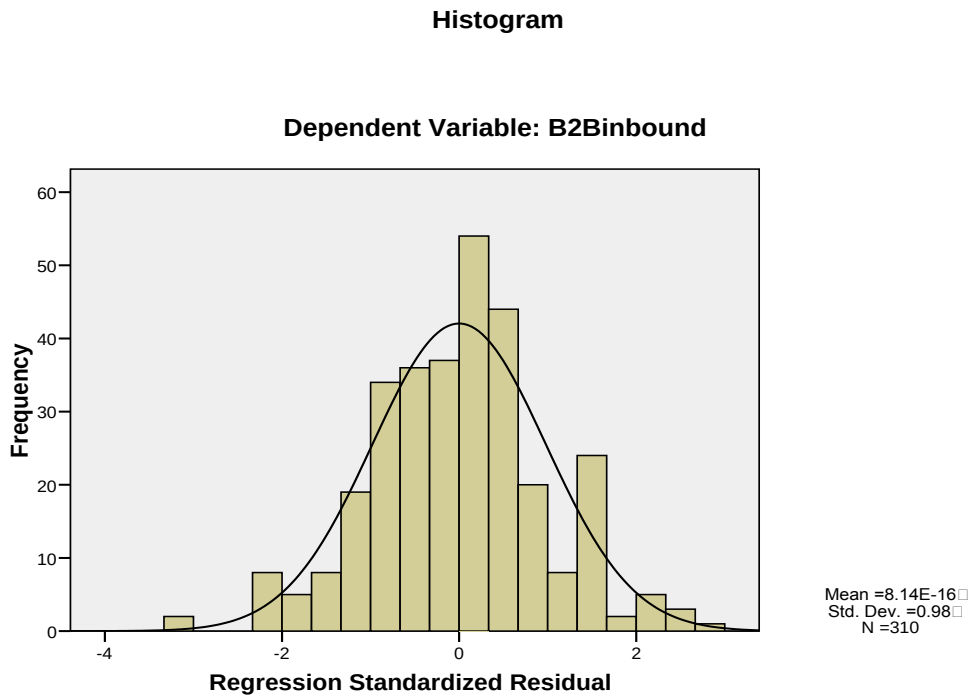

Figure C.5.1 Histogram showing frequency of Regression Standardised with Managers Knowledge

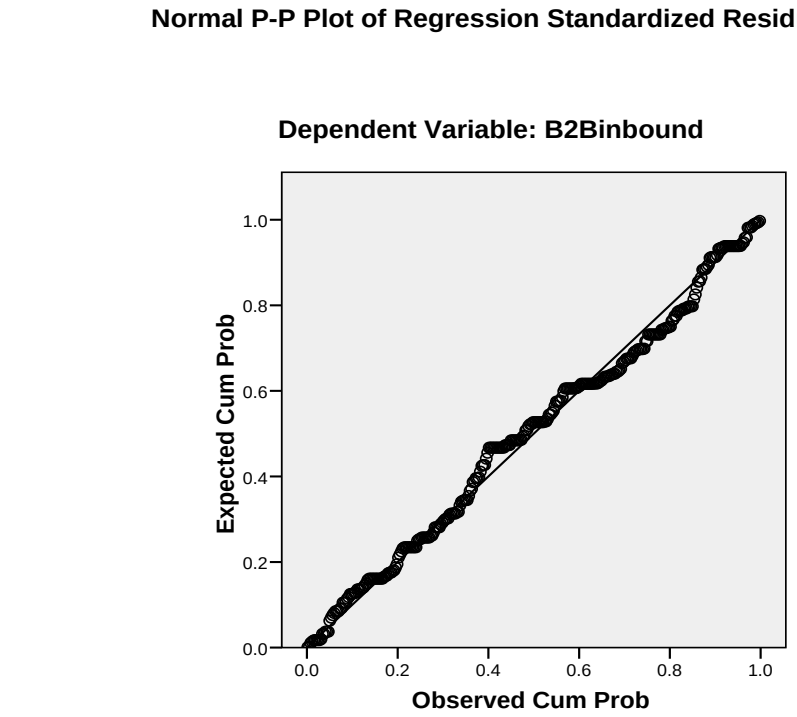

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Managers Attitude

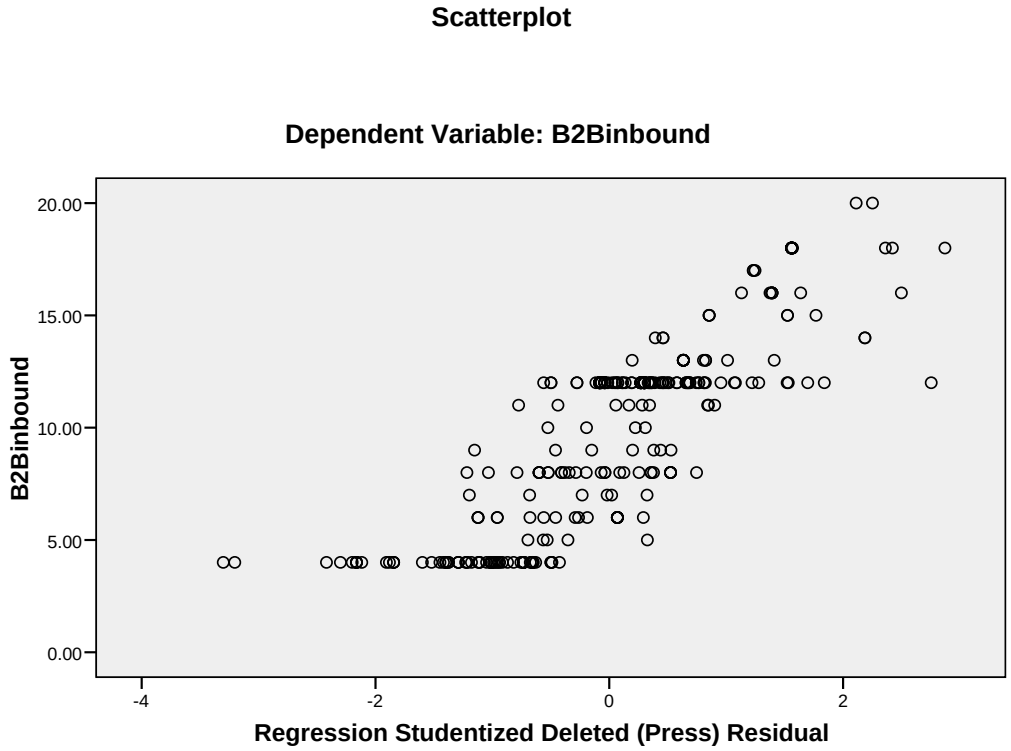

Figure C.5.3 Scatter plot of Regression Standardised Residual with Managers Attitude

B2B OUTBOUND

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.572(a)	.327	.299	3.63854

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1833.402	12	152.784	11.540	.000(a)
	Residual	3773.098	285	13.239		
	Total	5606.500	297			

Table C.1 Results of multiple linear regression analysis on managers attitude

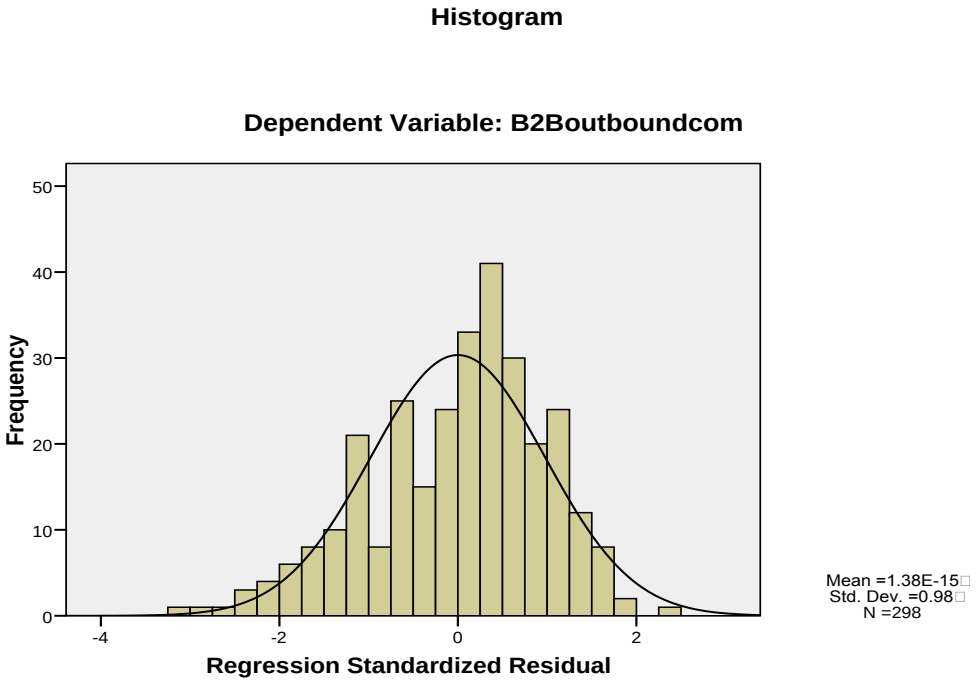

Figure C.5.1 Histogram showing frequency of Regression Standardised with Managers Knowledge

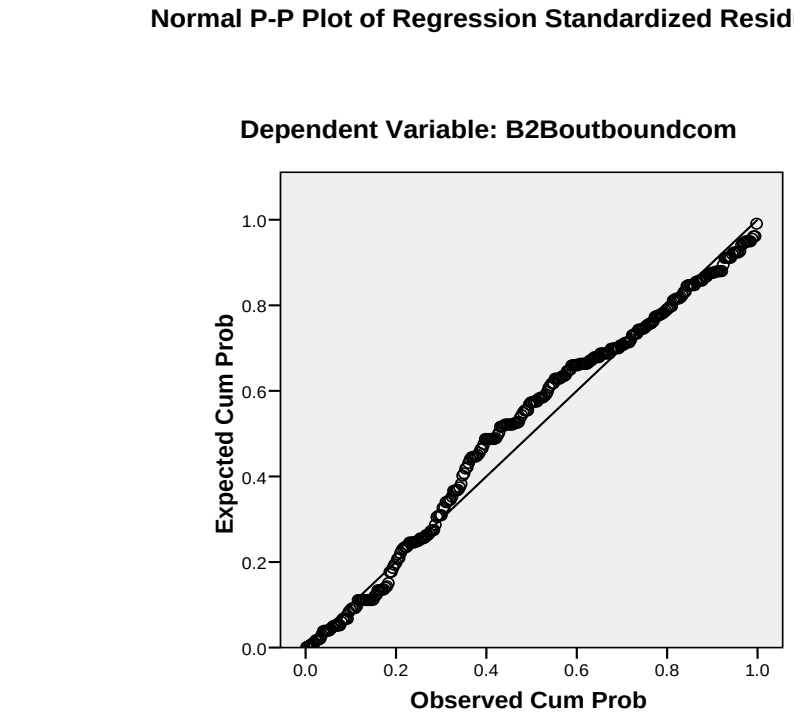

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Managers Attitude

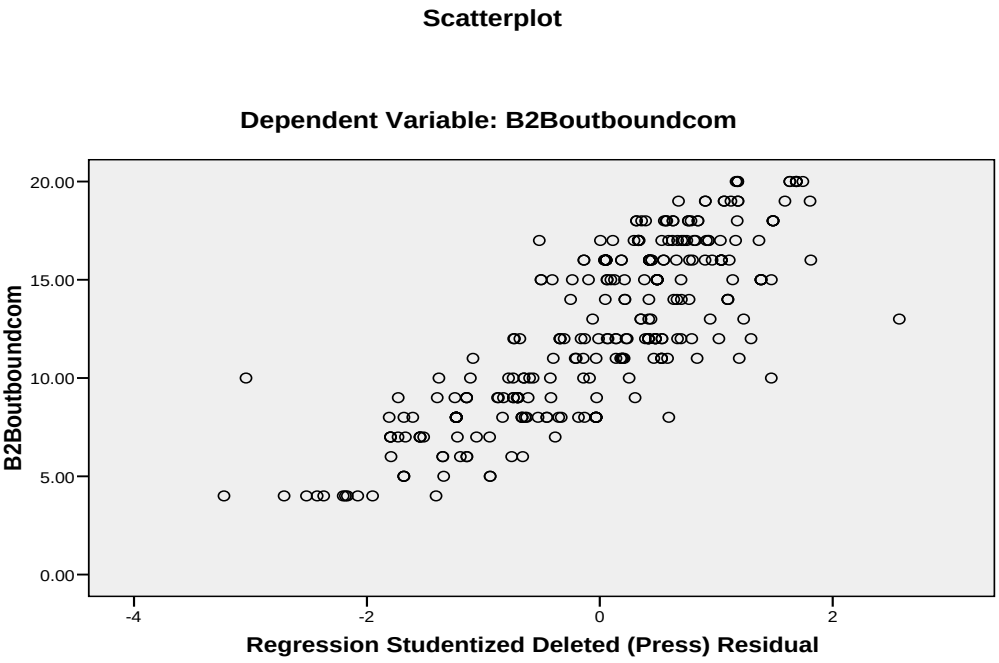

Figure C.5.3 Scatter plot of Regression Standardised Residual with Managers Attitude

ENVIRONEMNTAL CONTEXT

INFORAMTION INTENSITY

B2C OUTBOUND

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.512(a)	.262	.253	3.32778	.262	28.456	4	321	.000

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1260.509	4	315.127	28.456	.000(a)
	Residual	3554.792	321	11.074		
	Total	4815.301	325			

Table C.1 Results of multiple linear regression analysis on information intensity

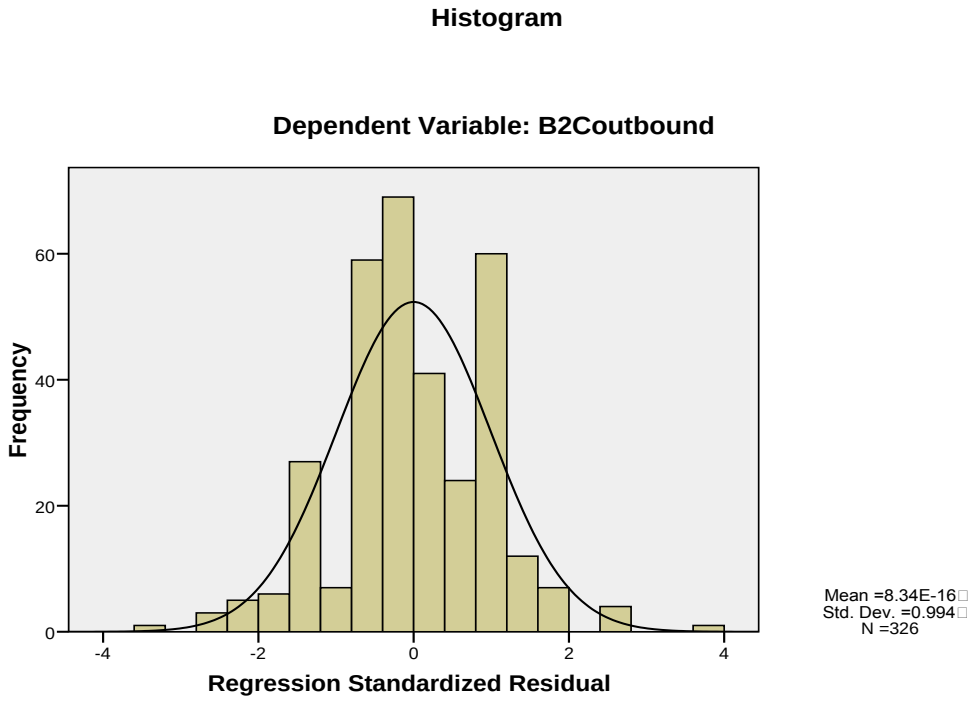

Figure C.5.1 Histogram showing frequency of Regression Standardised with Information Intensity

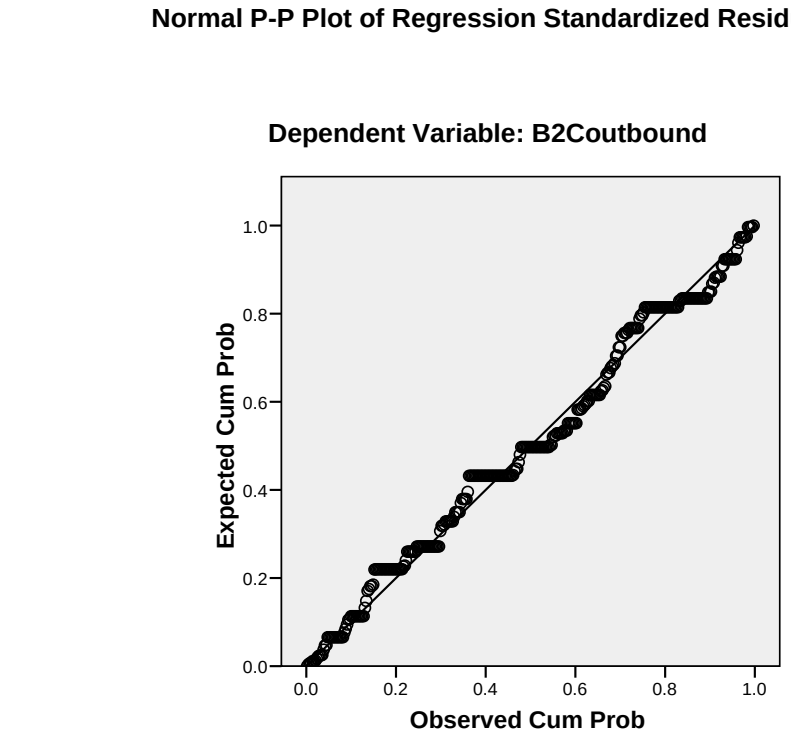

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Information Intensity

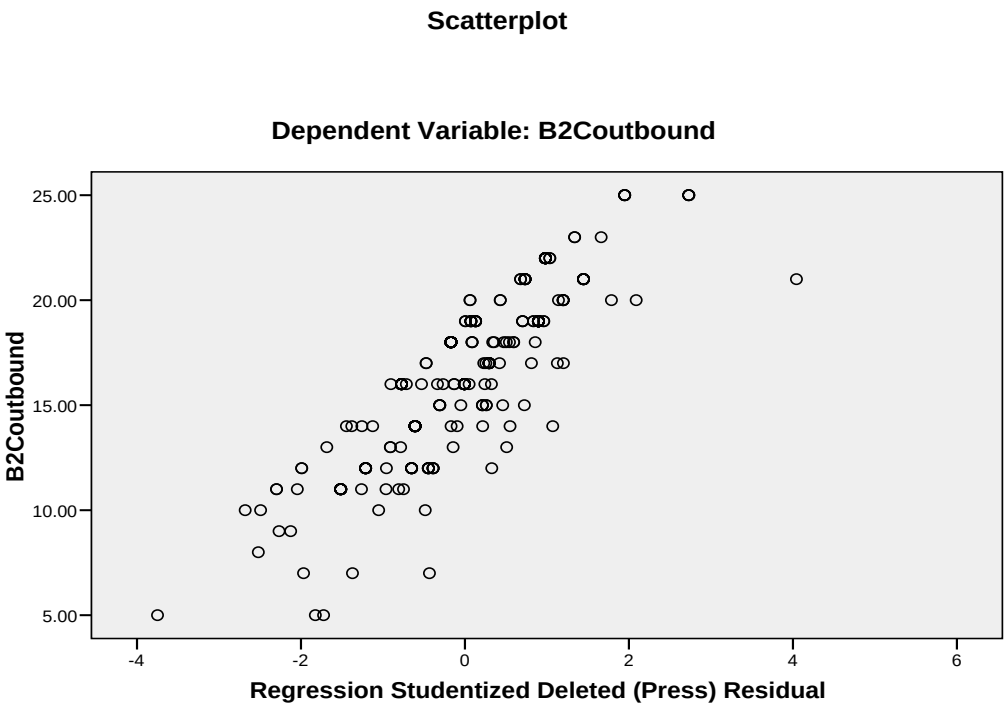

Figure C.5.3 Scatter plot of Regression Standardised Residual with Information Intensity

B2C ORDERTAKING

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.400(a)	.160	.149	3.33729	.160	15.294	4	322	.000

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	681.340	4	170.335	15.294	.000(a)
	Residual	3586.281	322	11.138		
	Total	4267.621	326			

Table C.1 Results of multiple linear regression analysis on information intensity

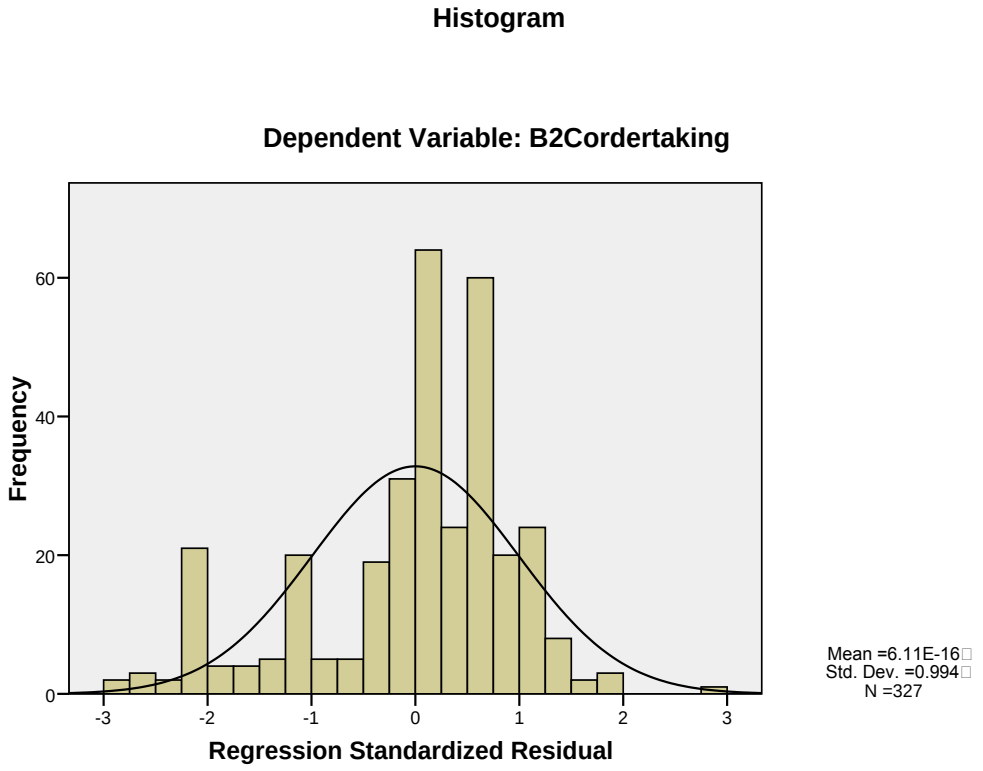

Figure C.5.1 Histogram showing frequency of Regression Standardised with Information Intensity

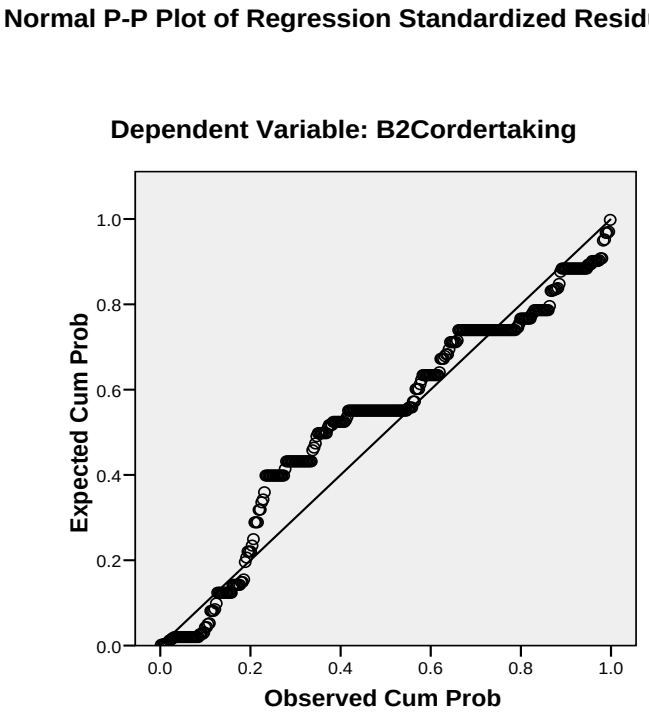

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Information Intensity

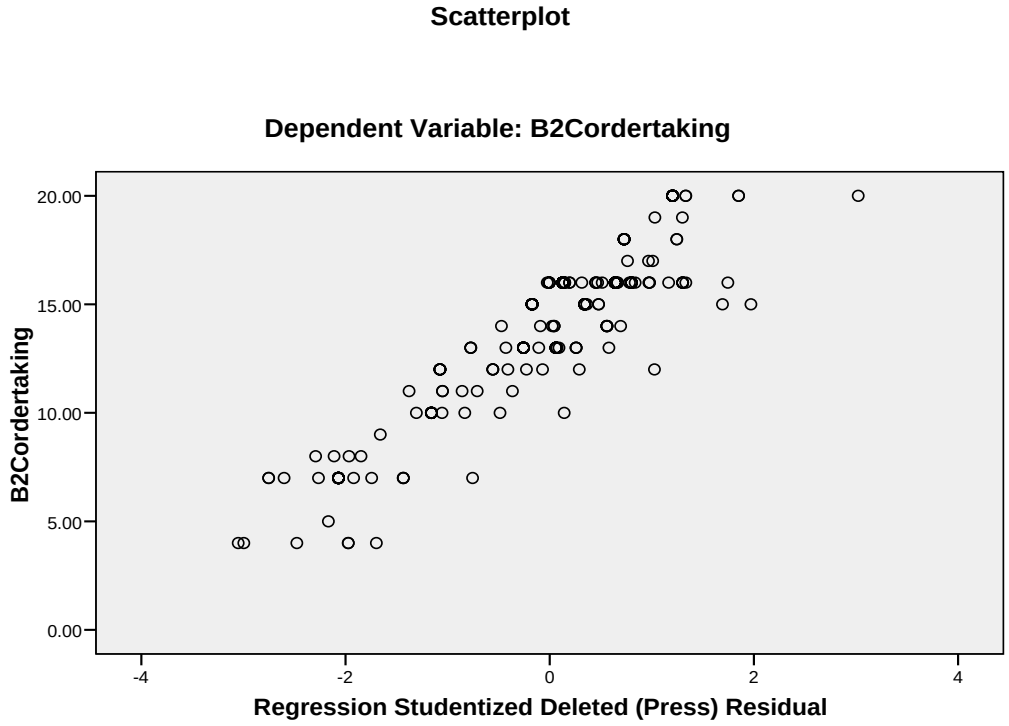

Figure C.5.3 Scatter plot of Regression Standardised Residual with Information Intensity

B2B INBOUND

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.523(a)	.273	.264	3.72263

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1657.774	4	414.444	29.906	.000(a)
	Residual	4406.845	318	13.858		
	Total	6064.619	322			

Table C.1 Results of multiple linear regression analysis on information intensity

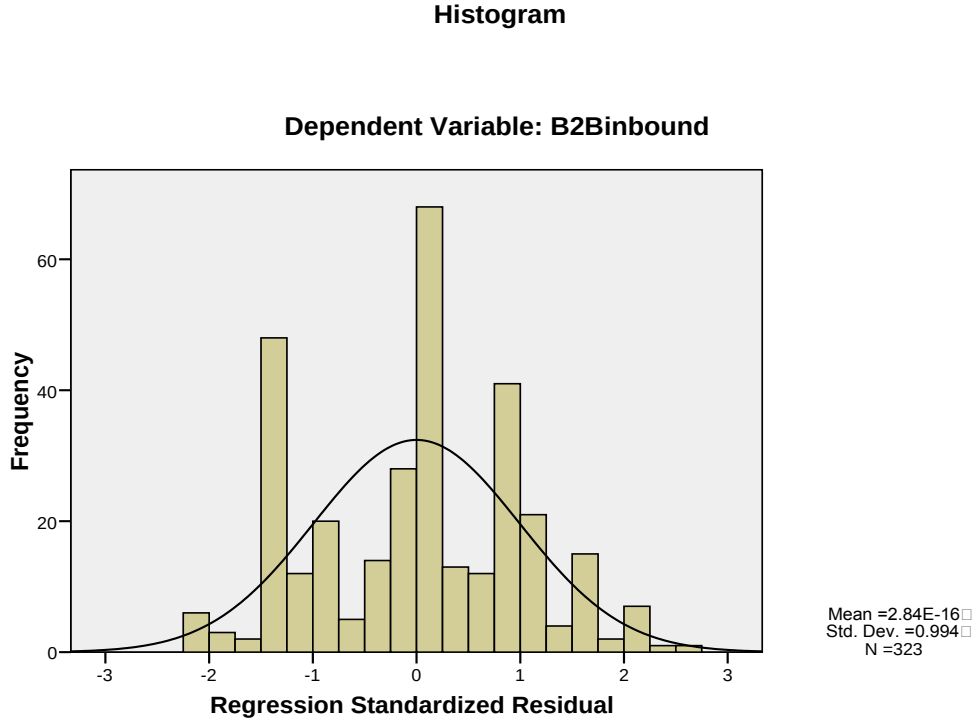

Figure C.5.1 Histogram showing frequency of Regression Standardised with Information Intensity

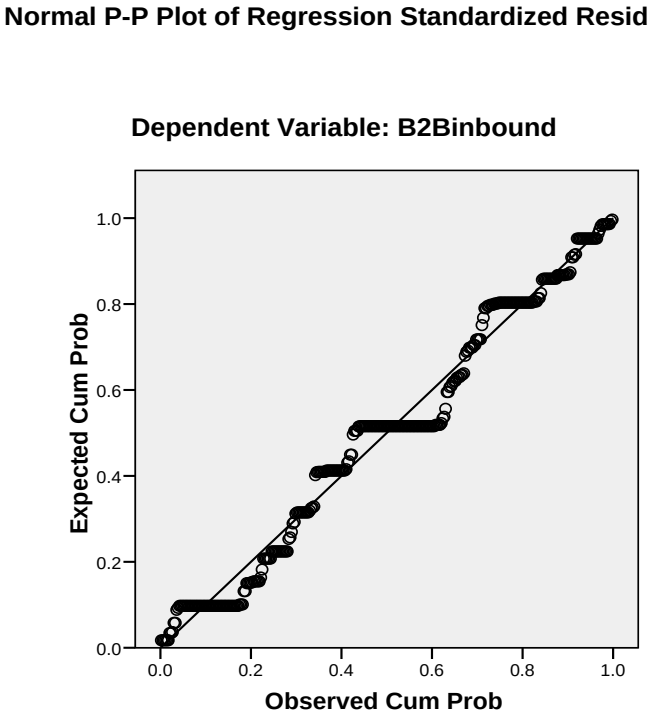

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Information Intensity

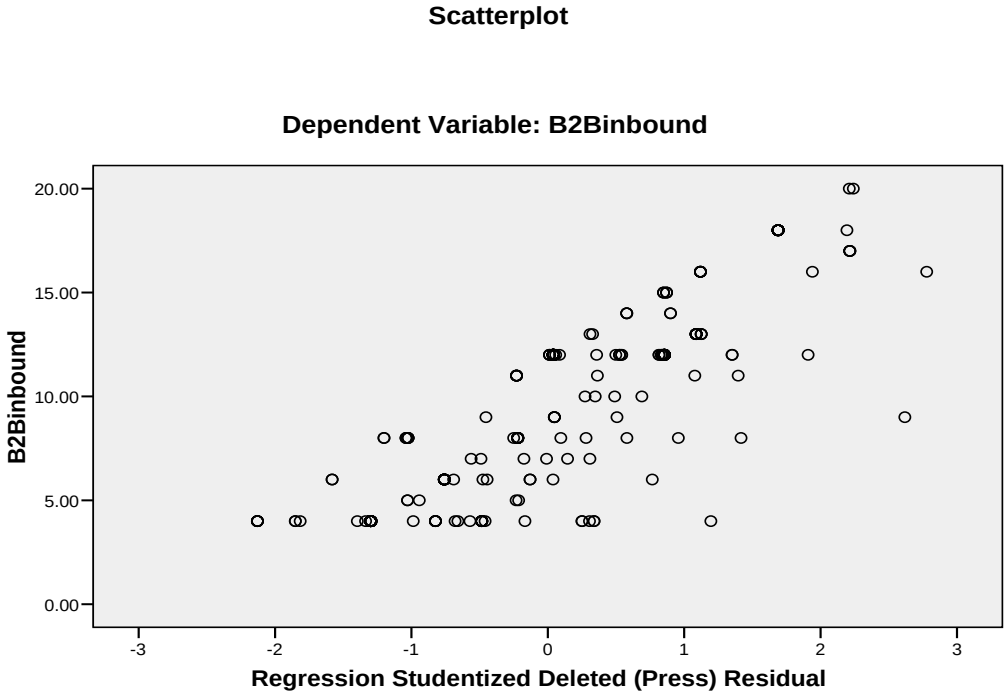

Figure C.5.3 Scatter plot of Regression Standardised Residual with Information Intensity

B2B OUTBOUND

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.464(a)	.215	.205	3.89014

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1268.909	4	317.227	20.962	.000(a)
	Residual	4630.751	306	15.133		
	Total	5899.659	310			

Table C.1 Results of multiple linear regression analysis on information intensity

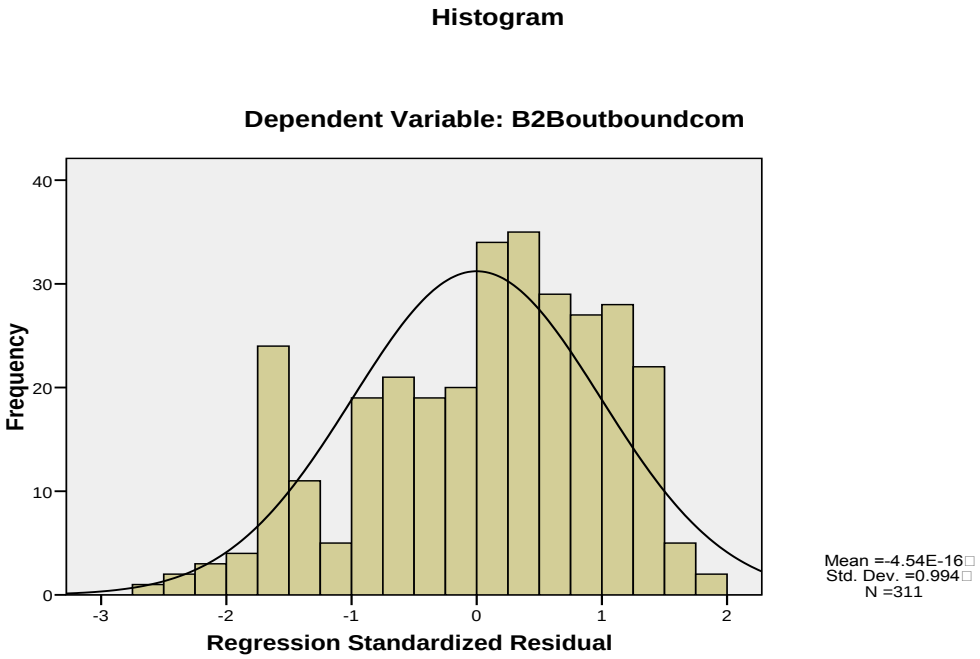

Figure C.5.1 Histogram showing frequency of Regression Standardised with Information Intensity

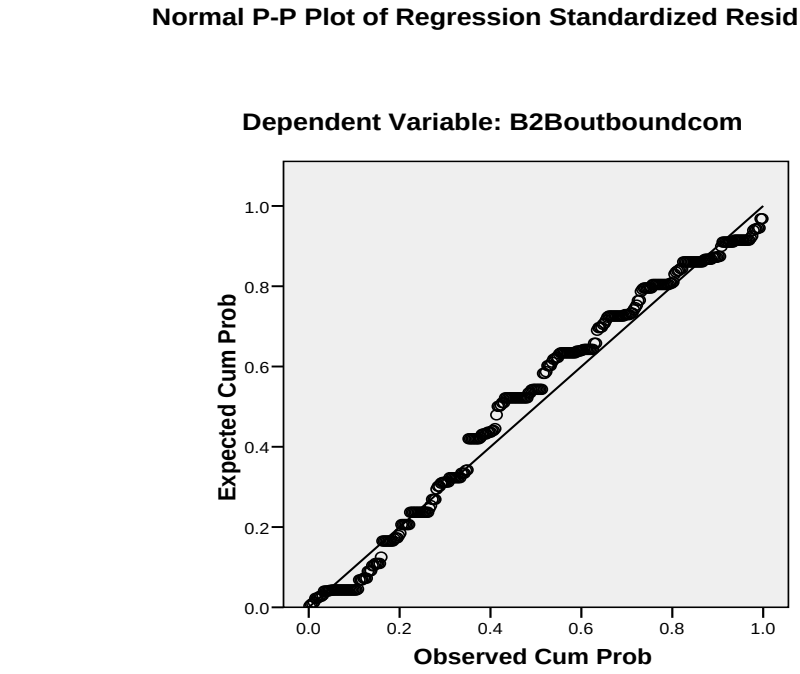

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Information Intensity

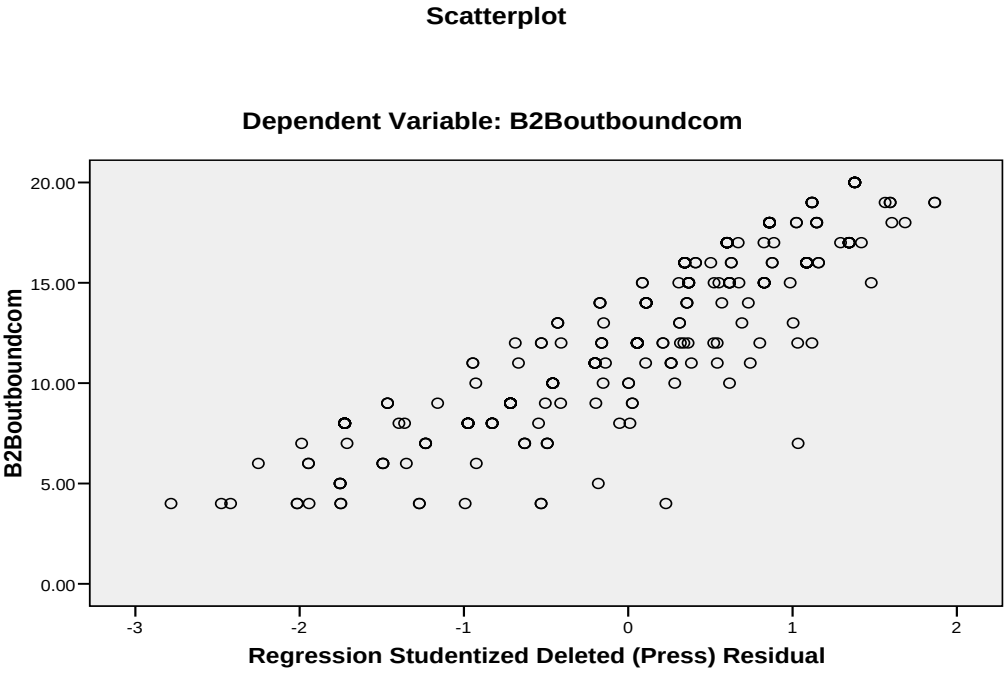

Figure C.5.3 Scatter plot of Regression Standardised Residual with Information Intensity

COMPETITION

B2C OUTBOUND

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.590(a)	.348	.336	3.14689	.348	28.203	6	317	.000

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1675.768	6	279.295	28.203	.000(a)
	Residual	3139.232	317	9.903		
	Total	4815.000	323			

Table C.1 Results of multiple linear regression analysis on competition

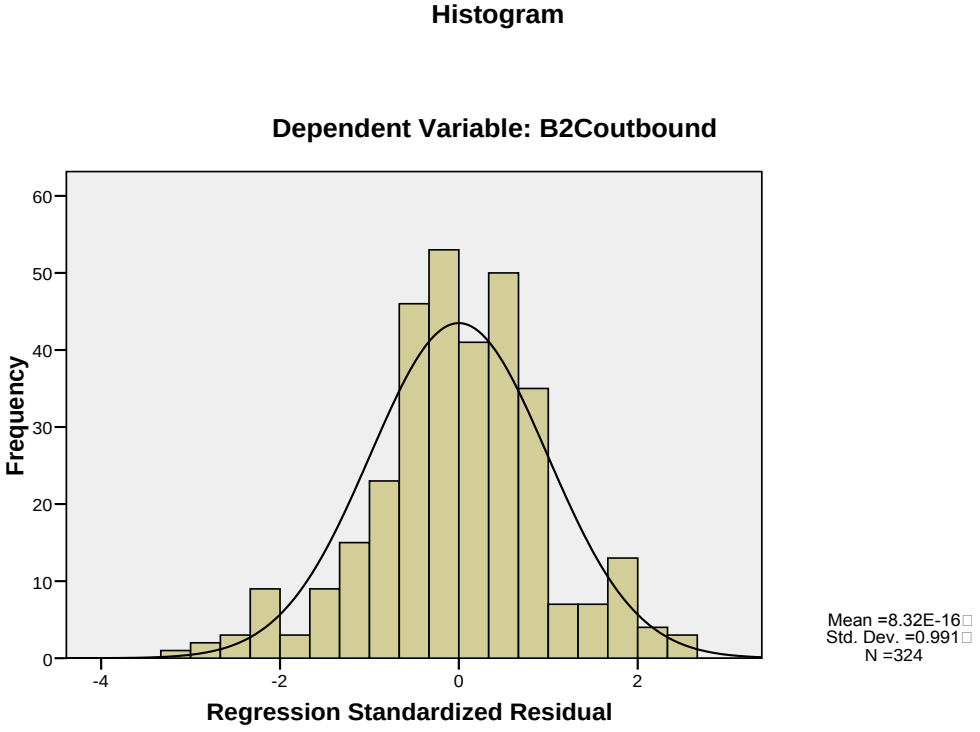

Figure C.5.1 Histogram showing frequency of Regression Standardised with Competition

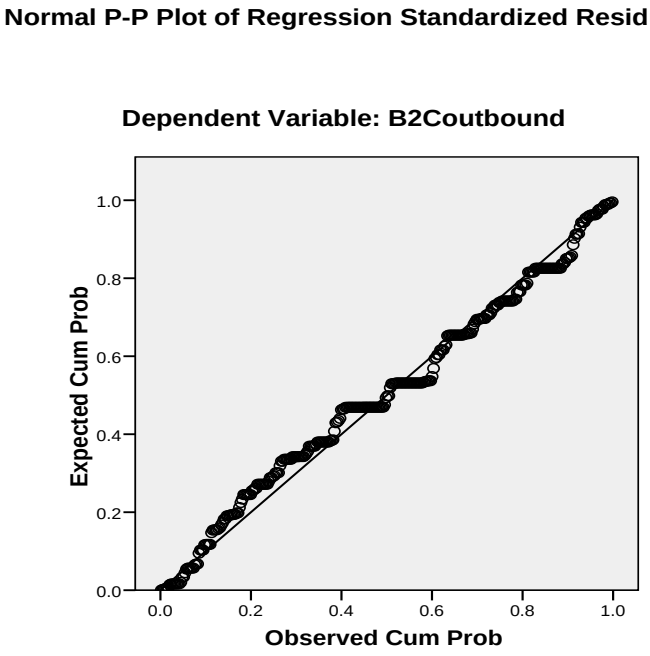

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Competition

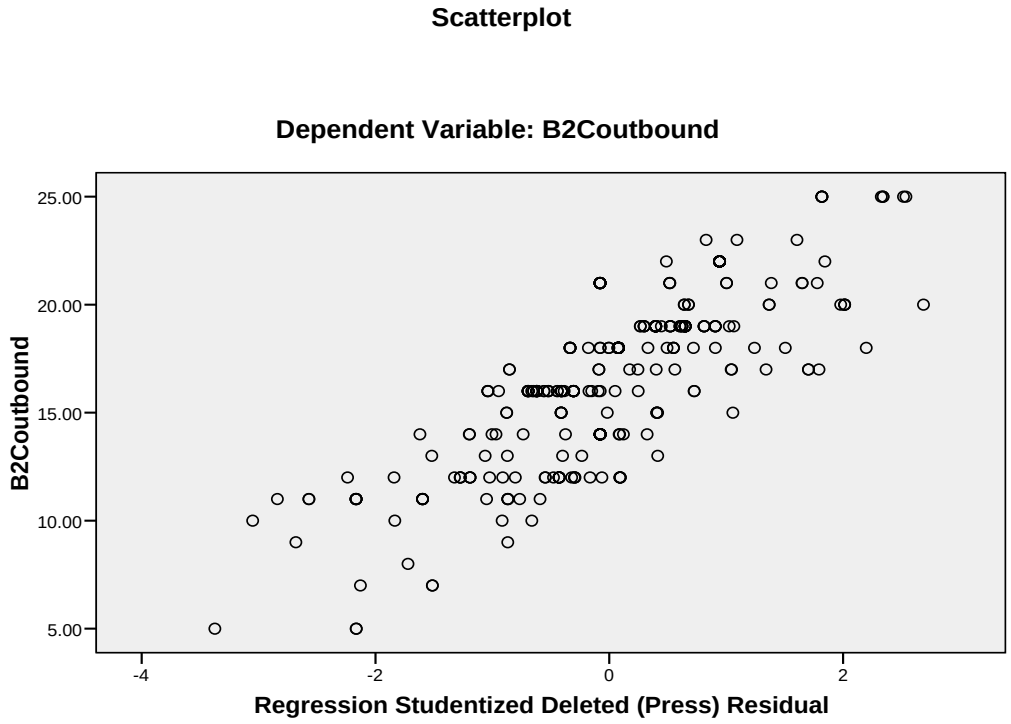

Figure C.5.3 Scatter plot of Regression Standardised Residual with Competition

B2C ORDERTAKING

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.505(a)	.255	.241	3.14261	.255	18.145	6	318	.000

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1075.205	6	179.201	18.145	.000(a)
	Residual	3140.568	318	9.876		
	Total	4215.772	324			

Table C.1 Results of multiple linear regression analysis on competition

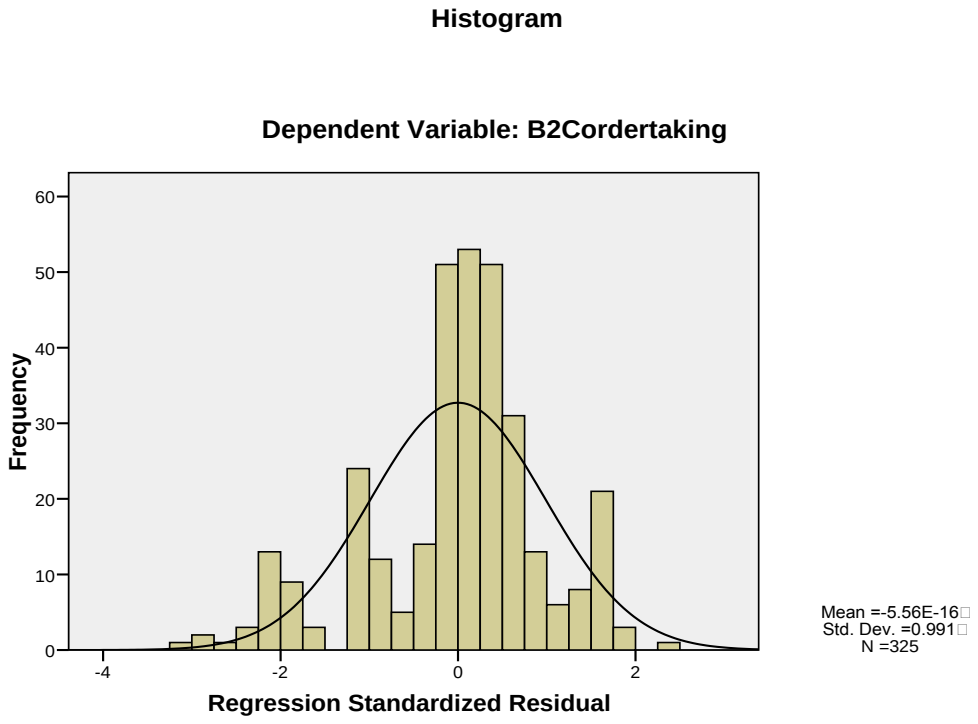

Figure C.5.1 Histogram showing frequency of Regression Standardised with Competition

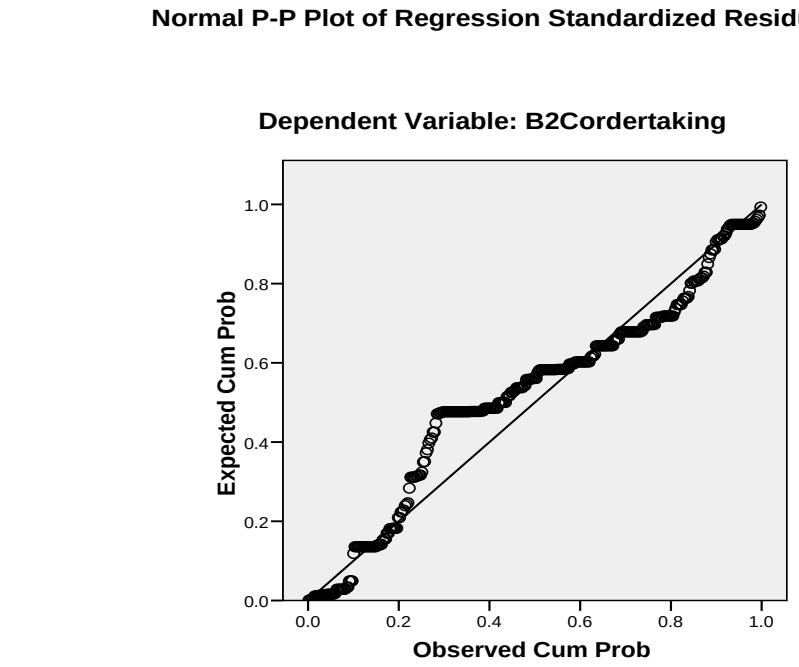

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Competition

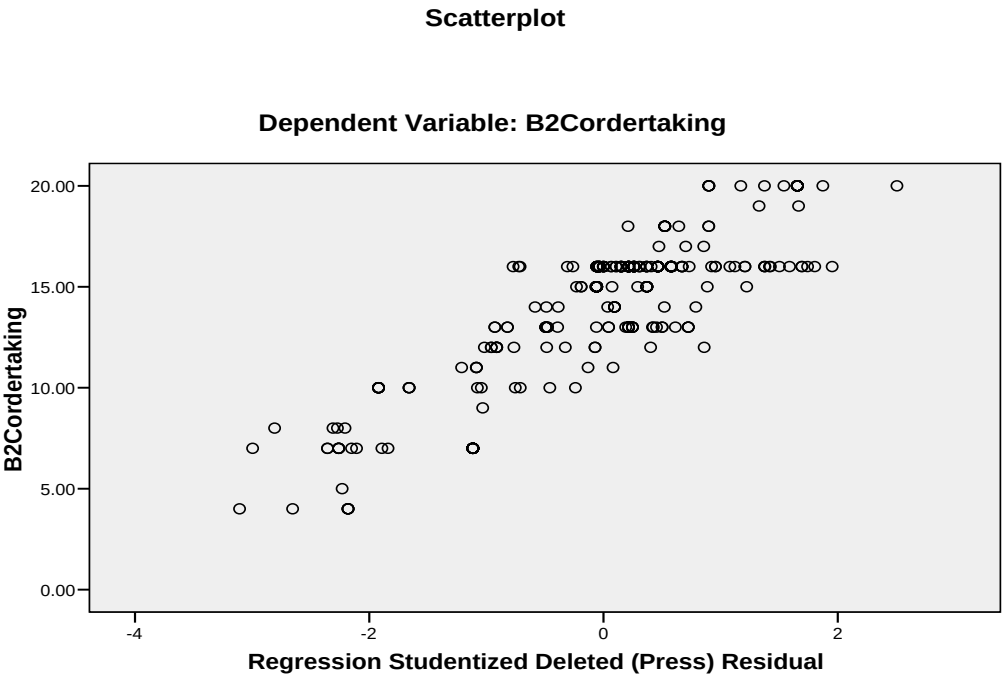

Figure C.5.3 Scatter plot of Regression Standardised Residual with Competition

B2B INBOUND

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.609(a)	.371	.359	3.47747

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2237.094	6	372.849	30.832	.000(a)
	Residual	3797.149	314	12.093		
	Total	6034.243	320			

Table C.1 Results of multiple linear regression analysis on competition

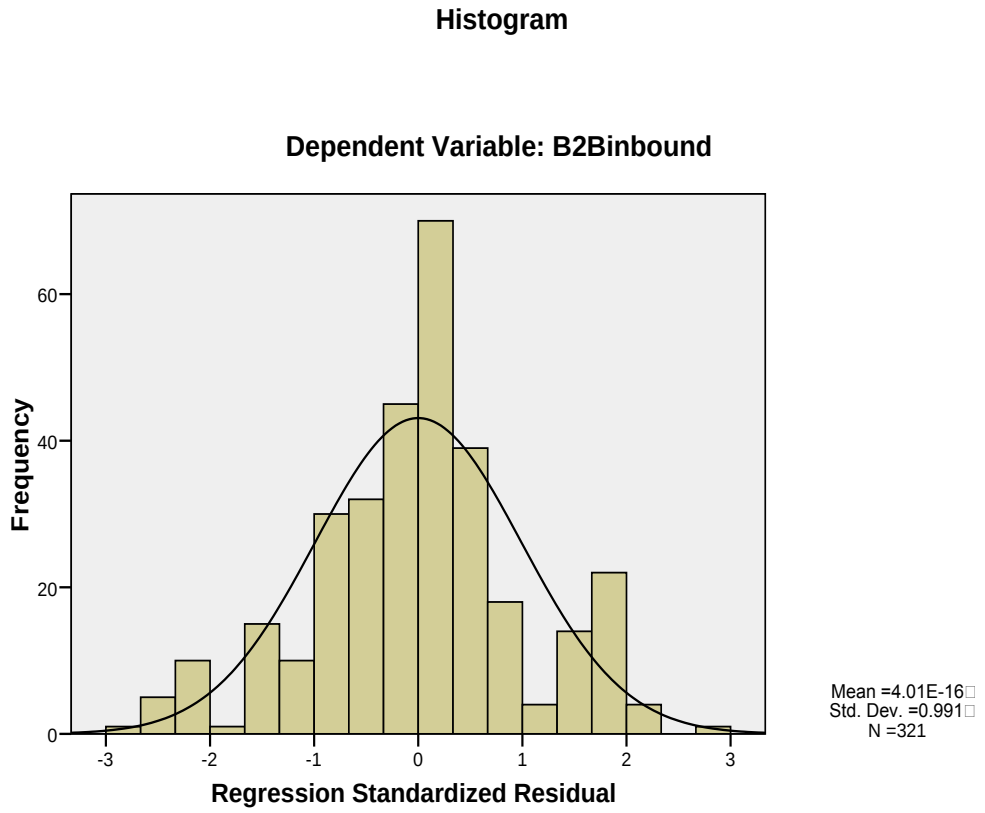

Figure C.5.1 Histogram showing frequency of Regression Standardised with Competition

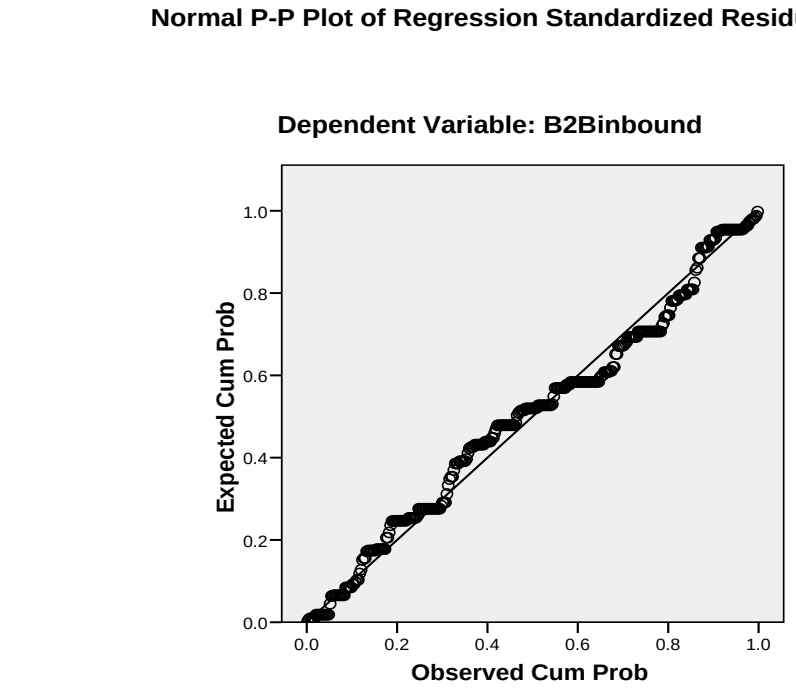

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Competition

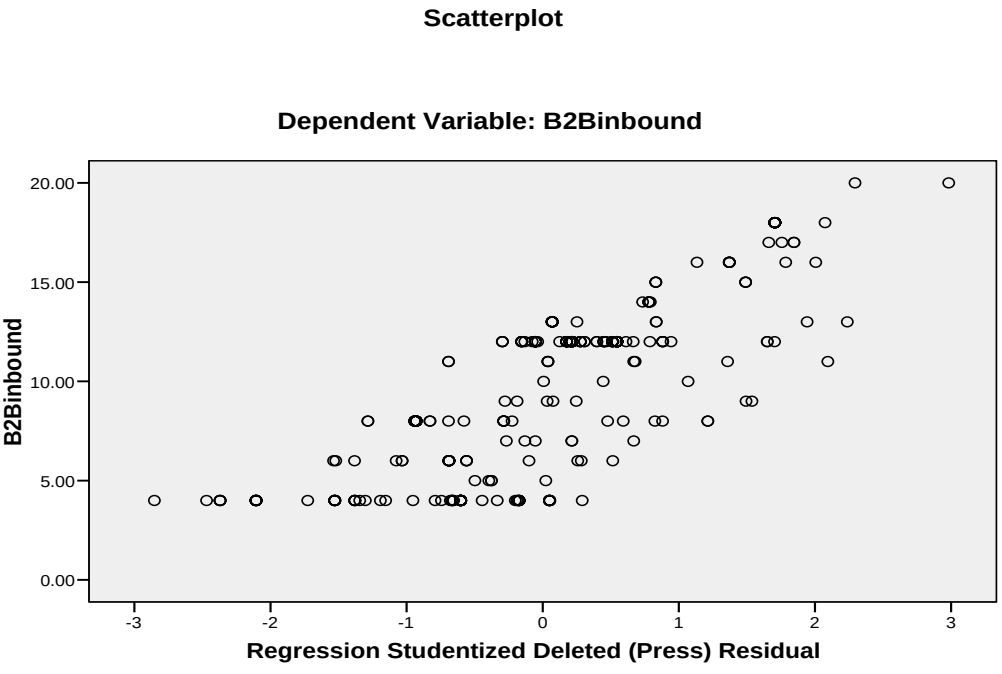

Figure C.5.3 Scatter plot of Regression Standardised Residual with Competition

B2B OUTBOUND

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.626(a)	.392	.380	3.43523

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2295.306	6	382.551	32.417	.000(a)
	Residual	3563.840	302	11.801		
	Total	5859.146	308			

Table C.1 Results of multiple linear regression analysis on competition

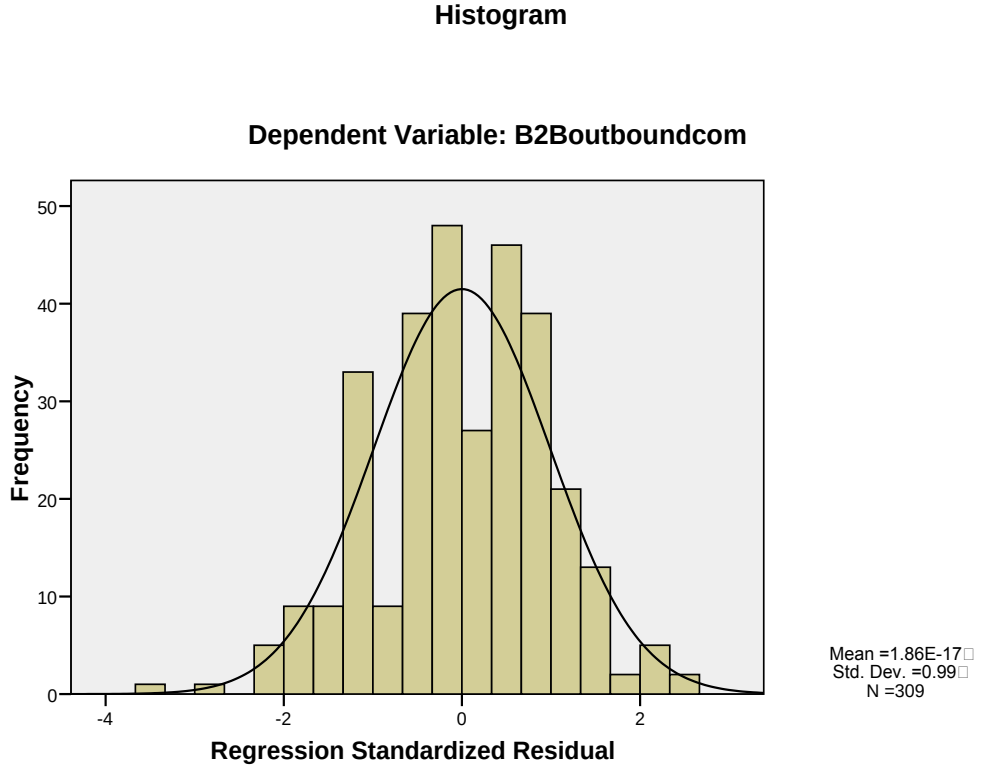

Figure C.5.1 Histogram showing frequency of Regression Standardised with Competition

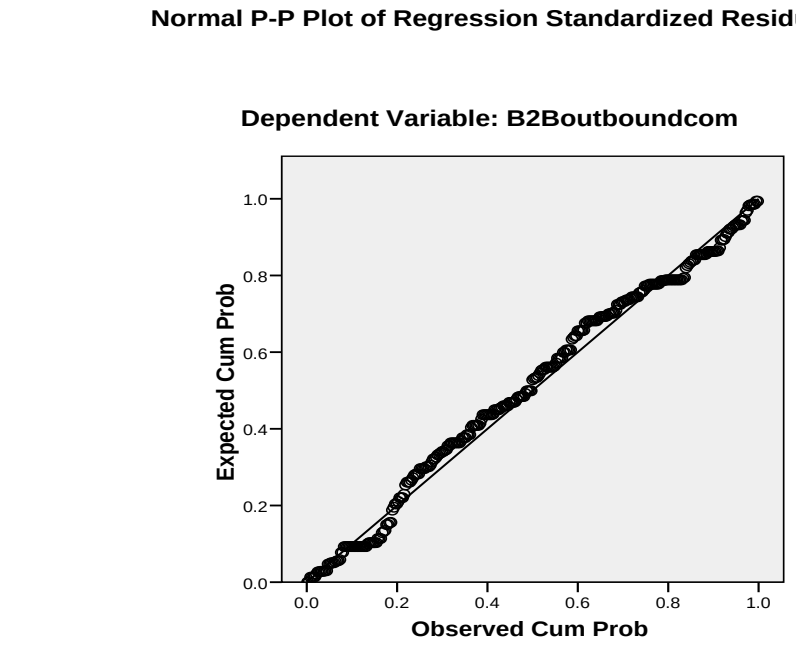

Figure C.5.2 Normal P-Plot of Regression Standardised Residual with Competition

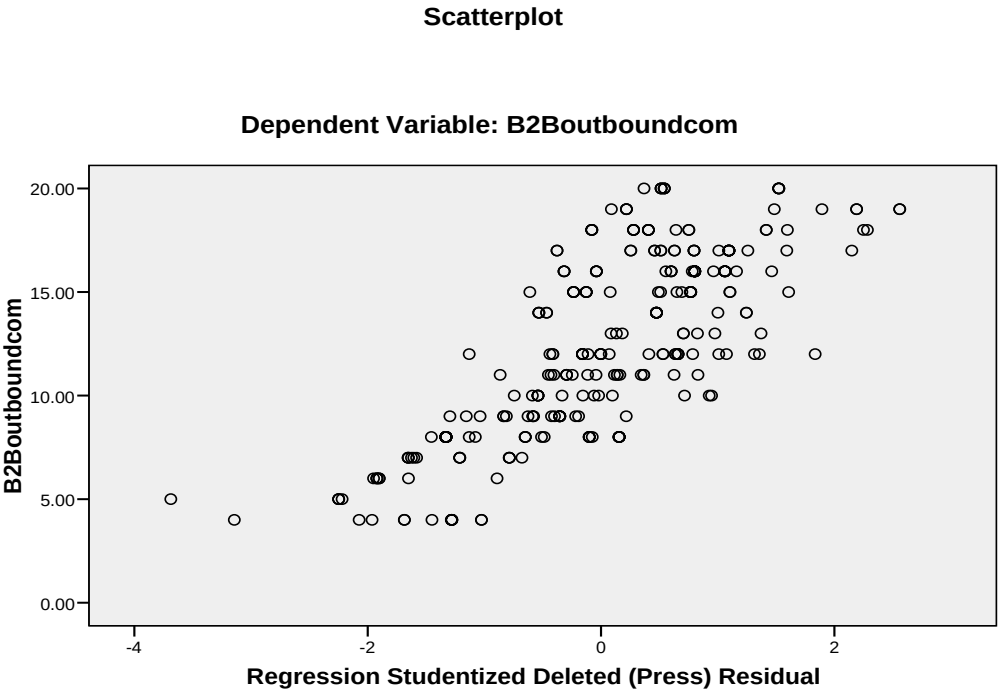

Figure C.5.3 Scatter plot of Regression Standardised Residual with Competition

APPENDIX 5: Letter to Respondents

UNIVERSITY OF KWAZULU-NATAL
School of Management

Dear Respondent,

PhD Research Project

Researcher: Nomsa Mndzebele (0767114659)

Supervisor: Prof. M.S. Maharaj (Ext. 8003/8023)

Prof. B. McArthur (Ext. 5605)

Research Office: Ms P Ximba 031-2603587

I, Nomsa Mndzebele a PhD student in the School of Management, at the University of KwaZulu-Natal. You are invited to participate in a research project entitled Determinants of Electronic Commerce Adoption in the Hotel Industry in South Africa.

The aim of this study is to:

- *To determine the relationship between each of the technological factors and the extent of electronic commerce adoption.*
- *To determine the relationship between each of the organisational factors and the extent of electronic commerce adoption.*
- *To determine the relationship between each of the environmental factors and the extent of electronic commerce adoption.*
- *To determine the factors can predict the overall extent of EC adoption from a combination of organisational factors, technological factors, technological factors and environmental factors*.

Through your participation I hope to understand the determinants of electronic commerce in the hotel industry in South Africa. The results of the study are intended to contribute to academic, business (hotels) and economical because South Africa makes a lot of revenue from international visitors.

Your participation in this project is voluntary. There will be no monetary gain from participating in this research. Confidentiality and anonymity of records will be maintained by the School of Management**,** UKZN.

If you have any questions or concerns about participating in this study, please contact me or my supervisor at the numbers listed above.

Sincerely

Investigator's signature_____ Date_____

APPENDIX 5: Ethical Clearance Letter