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The Role of Business Continuity Management for Sustaining Corporate Cost advantage

Abstract

Since the business world continues to change, there are apparently growing challenges to organizational plans for the continuation of business operations and the preservation of Cost advantage. As an insight into many vulnerable systems and other external threats, BCM is an important pillar for value creation. This study aims at proposing a framework that shows how the organizations' Cost advantagecould be enhanced through BCM factors. The constructs of this analysis are defined based on a comprehensive review of recent literature on BCM, Cost advantage, and IT infrastructure flexibility. The data was collected through various methods including a self-administered approach and the distribution of questionnaires via electronic mail and social media applications. The target population of the study is the Egyptian telecom organizations, these organizations are selected as they are deemed to possess a considerable sense of commitment towards embracing BCM best practices. Structural equation moeling techniques are implemented to study the effect of BCM factors on competitiveadvantage. The findings indicate that IT infrastructure flexibility strongly mediates the relationship between BCM factors and organizations' Cost advantage. The outcome of this study introduces a framework to researchers and BCM professionals in understanding the effects of BCM factors, and IT infrastructure flexibility on the corporates' Cost advantage.

KeyWords: Business Continuity Management factors, Cost Advantage, Embeddedness of Continuity Practices, Egyptian Telecom companies, Technological Turbulence, IT Infrastructure Flexibility.

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أراء الطلاب حول جودة التعليم الحضوري والتعليم عن بعد لمقررات المحاسبة خلال جائحة كوفيد–19 في المملكة العربية السعودية

ملخص البحث

أجبرت جائحة كوفيد– 19 العديد من الجامعات، بما في ذلك جامعات المملكة العربية السعودية، على التحول بشكل مفاجيء من التعليم الحضوري إلى التعليم عن بعد، مما أجبرهم على التكيف مع الفصول الدراسية الافتراضية عن طريق الإنترنت مع ضمان جودة التعليم. وتهدف هذه الدراسة إلى تحديد ما إذا كانت هناك فروق بين جودة التعليم الحضوري والتعليم عن بعد لمقررات المحاسبة.

وقد تم جمع أراء الطلاب من خلال استطلاعات الرأي لعينة منهم. وأظهر تحليل العامل الاستكشافي ومؤشر الإدراك المركب لكل طريقة عدم وجود فروق ذات دلالة إحصائية في الجودة المدركة بين التعليم الحضوري والتعليم عن بعد.

الكلمات المفتاحية: المحاسبة، التعليم الحضوري، التعليم عن بعد، كوفيد–19، المملكة العربية السعودية

1- Introduction

Over the past couple of decades, the turbulent business environment has grown more competitive. The demand to protect the continuity of critical business services has become more crucial than ever. Wherefore, most of the prominent international organizations and national governments advise companies to invest and to respond to crises in different ways. Since then, the adoption of strong BCMS is inevitably emphasized to sustain the organizations' cost advantage(K. Venclova, H. Urbancova, 2013; Drewitt, 2013). BCM has become the main driver for enhancing corporate risk resilience, and for surviving under excessive institutional and environmental pressures (Sawalha, 2013).

Despite BCM turns into a matter of great interest to businesses trying to combat negative forces and as a pillar for the firm value creation (Herbane et al., 2004), the empirical studies on its contribution to sustaining the organizations', cost advantageare still scarce. The literature remains primarily from a realistic perspective and focuses primarily on a small sample or concentrates on the BCM phases (Green, 2014). In addition, the prior studies provide different opinions for the BCM critical factors. This study is therefore intended to fill up this gap by proposing a framework that describes the role of BCM factors in sustaining the organizations' cost advantage through IT infrastructure flexibility.

2- Literature Review

2-1 Business Continuity Management Factors

Business Continuity Management emerged to identify potential threats to the organizations, assess their impact, and design a framework to build organization resilience to face those threats and sustain the continuity of the business (British Standards Institution, 2006). From different perspectives, previous literature discusse the factors that influence BCM practices. A recent study conducted on many medical centers and hospitals in India, determined six key factors of BCM including involving continuity planning fund (BCP), BCM Skills; risk recognition, contingency plan, BCM protocols, and government schemes (Jafar and Taneja, 2017). Abdullah et al. (2015) also conducted a study to examine the actual practice of BCM factors by focusing on organizations, people, processes, and technology to the failure of BCM implementation in Malaysia's public service. The study proves that, process is vital to the failure of the BCM. Followed by humans, technology, organization policy, culture, and finally the organization structure. On the other hand, the study put forward that BCM implementation should be involved at all organization levels, and cover all related critical business processes. By the same token, Deloitte (2012) emphasis the necessity of embedding the knowledge and culture of BCM; the study continued to prove BCM processes could not work effectively without endorsement from top management, and organizations as a whole should be aware of the BCMS including sub-contractors. Besides, Järveläinen (2013) proves that top-management support is a dominant operator, and the external requirements from either clients or government regulations play a pivotal role to persuade top management to ameliorate continuity. He also asserts the role of embeddedness continuity practices as a key factor on the perceived business impacts of the information system continuity management.

Continuing to follow a review of previous research on BCM factors, we conclude that determining the essential BCM factors would differ depending on the sector, region, and organization's culture. Moreover, factors must be better considered from a managerial perspective so that strategies, processes, and technology can be developed to better meet the needs of decision-makers (White, C., & Turoff, 2010). Accordingly, this research adopts two critical BCM factors: the embeddedness of continuity practices, and technological turbulence as independent variables. Those factors are crucial to ensure the successful implementation of the BCM within the Egyptian telecom organizations and they are selected as their definitions and scopes in literature. The details of each factor are discussed in the following sections.

2-1-1 Embeddedness of Continuity Practices

To foster the embeddedness of the business continuity process, an entity can use a mixture of ways to communicate its relevance that includes activities to raise awareness, training, and personalized regular communication to meet the needs of different target groups. These actions show, to what extent BCM is embedded and ongoing within the organization as a one-off activity (Abu Baka et al., 2015).

Low et al. (2010) also refers to the importance of setting up an organizational BCM culture. To ensure that a culture of continuity embedded in the business could be, by increasing awareness across important stakeholders, or/and providing training for important staff on BCM concerns. One strategy to embed BCM into an organization, is to adoption global norms or frameworks that systematically incorporate BCM into present critical procedures (Järveläinen, 2013). The frequently adopted BCM associated standards are ISO 22301, ISO 27001, BS 25999, NFPA 1600, NIST SP 800, and PASS.

2-1-2 Technological Turbulence

It could be argued that the only way for a company to retain its competitive edge is to remain successful in a turbulent environment. Technological turbulence has been described as one of the most significant factors in the frequency of instability in the telecoms industry (Nashiruddin, 2018). For that reason, business continuity managers should not lose sight of the fact that, technological turbulence could have been more uncontrollable and might play a significant impact in ensuring business continuity (Hoong, L. L., & Marthandan, 2011). In this sense, this study considers the points that reflect the extent to which technology was in a state of uncertainty in the industry and the significance of its impact as a BCM factor in preserving the organization's value. Technological turbulence refers to the rate of change of the service technologies used to transform inputs into outputs (Jaworski and Kohli, 1993a).

2- 2 The Role of IT Infrastructure Flexibility

In literature, IT infrastructure is commonly described as a set of shared IT resources that are a basis for connectivity across an enterprise's future and current business applications. Not only the technical aspects but the human components are included (Duncan, 1995; Byrd and Turner, 2000) too. Byrd and Turner (2000) endorse the capability of the infrastructure to support a broad range of hardware, software, and communication technologies to distribute information inside and outside the enterprise and to promote the design and development of a variety of business applications. Based on previous studies, four core components of IT infrastructure flexibility were established. While Duncan (1995) and Byrd &Turner (2001) first established connectivity, compatibility, modularity, and competencies in IT personnel as an additional component of IT infrastructure flexibility, Mishra and Agarwal (2010) have introduced organizational cognition to IT (Technological Framework). However, connectivity, compatibility, and modularity are the most generally recognized dimensions of IT infrastructure functionality. This is taken into account in this study as well.

In the context of BCM, Itami et al. (1991) highlight organizations with higher IT capabilities are perceived to be in a superior position to handle the "invisible resources" that create market dominance. Information technology knowledge involves the level to which an organization's technical knowledge of objects, such as computer-based systems is accessible (Tippins and Sohi, 2003). BCM tackles the damages to business processes caused by IT infrastructure that resulted in a loss of income, legal consequences, and reputational damage and may lead to business failures. The main reason is that firms and business processes today rely more than ever on information technology (Winkler et al., 2010). Besides, Podaras et al. (2016) conducted a study to design a business continuity checkpoints framework that can help to establish an effective business continuity strategy for IT and business managers. On the other hand, Abu Bakar et al. (2015) shows how the IT capability moderates the relationship between BCM factors and organizations' financial performance. The study referred to IT capability as "a firm's ability to acquire, deploy, and leverage its IT-related resources in combination with other resources to achieve gain and maintain a Cost advantage." This study extends that proposition by specifying to what extend BCM factors relate to organizational IT infrastructure flexibility.

2-3 Business Continuity Management and Cost Advantage

According to Sekliuckienė, J., & Langvinienė (2011), the concept of competitiveness relates to the capability of service providers to take swift action in response to market changes, and to protect positions already held. under the current second wave of global economic crises, the Cost advantageof crisis response becomes a fundamental activity during an incident, which is an integral part of BCM systems. It is important to understand practically the influence of BCM in preserving the Cost advantage, BCM is the main driving factor for strengthening the ability of the organization to withstand risks and thrive under severe organizational and environmental pressures (Herbane, 2010; Bakar et al., 2016). Similar to the objective of risk management, BCM can also contribute significantly to the optimization of organization performance (Sawalha, 2013 & Herbane et al. 2004).

Herbane et al. (2004) prove the significant role of the BCM not only in defending, but in also contributing to the value-adding network through more active processes or through superior sensitivity, performance, and safety to provide value-adding benefits to customers. Business Continuity is a vital success factor for a business to maintain and retain a Cost advantagesuch as profits, product cost efficiency, and service quality (Wong, 2019). A Cost advantage, is an efficient crisis reaction while an inefficient reaction is detrimental to the company and may threaten the life of an entity. Those outcomes achieved by integrating BCM concepts into board planning while reducing downtimes; maintaining customer trust, and winning potential opportunities are advantages over the competition, resilience can be accomplished by improving flexibility, in effect by adjusting strategic approaches to tackle the situation at hand to generate a Cost advantagefor management activities (Wong, 2019). Furthermore, recent reports claim if the organization has a viable system of business continuity, its rivals probably would take it as an advantage. It is a challenge, in today's world to be able to adapt to business disturbances, recover, and restart if they arise, making business partners and customers more appealing (BCM metrics report). On the other side, If the duration or excess of a business interruption is substantial, any crucial operational failure can lead to degradation of service and even to a financial loss (Bakar, Z. A et al., 2016).

3- Research Problem and Questions

Competitive dynamics and global trends force companies to take action to guarantee their business continuity. In Egypt, following the global financial crisis of 2008, the situation has become worse as organizations that experienced an economic decline in 2011 reached their peak particularly after the Arab Spring revolutions that placed many organizations in a critical position. Organizations are in a real challenge to combat such negative forces and continue their businesses. BCM is therefore become a vital success factor to ensure the continuity of business operations and preserve the firm's Cost advantage (Wong, 2019). In terms of the BCM implementation, path, and crucial success factors, prior literature had different views (Leong, 2014). As such, there is no framework for business or IS continuity management that has been verified academically (Järveläinen, 2013). Besides, the critical success factors for implementing BCM/DRP are not validated (Chow, 2000; Kelly, 2012). Moreover, BCM's current research, has been mostly limited to a small sample or focused on the phases of BCM (Green, 2014). It doesn't empirically investigate BCM role in preserving organizations' value (Herbane, Elliott and Swartz, 2004; Torabi, Giahi and Sahebjamnia, 2016).

Accordingly, through verification of the proposed research hypotheses and reasonably large sample size, there is an opportunity to present how the Egyptian telecom entities can sustain their Cost advantagethrough identifying the organization's BCM critical factors. In other words, to further develop a framework that shows a detailed view of the pivotal linkage between BCM factors and Cost advantage.

3- 1 Research Questions

Few business frameworks ,academically, verified the impact of BCM factors in preserving the Cost advantage. Besides, the need to identify BCM critical factors across different economic sectors become a necessity. Accordingly, this study seeks answers to the following questions:

- What are the BCM critical factors within this industry?
- Do the BCM factors significantly affect the Cost advantages of the Egyptian telecom organizations?
- Does the IT infrastructure flexibility play a significant role in the relationship between BCM factors and organizations' cost advantage?

4- Research Hypotheses

The role of BCM factors in preserving the organizations' cost advantage has not been widely investigated. The previous literature on developing: Frameworks (Gibb and Buchanan, 2006 ; Järveläinen, 2013; Lin, Kao, and Chen, 2012), guidelines (Sarkoni, 2012; Sharp, 2007), success reports (Lokey, 2009; Smith, 2005), and patents (Mehrdad, 2011) practically in the field of management science / operational research has received little attention (Sahebjamnia et al.,2018). Nevertheless, the arguments of these studies emphasize the role of adopted a strong BCMS to encourage the growth of businesses and ensures the sustainability of Cost advantages (Herbane et al., 2004). In addition, an acknowledgement for a notable importance of the BCM as a strategic management tool to reduce operating risk and its effects on core business operations also exist (Bakar, Z. A et al, 2016).

As previously stated in section 2.1, various viewpoints on the BCM critical factors and their relation to business value have been expressed in the literature. Although some argue that the embeddedness of continuity practices, management support, and external requirements are the key driving forces (Järveläinen, 2013; Bakar, Z. A., Yaacob, N. A., & Udin, 2016), others argue that technology is the most significant factor in BCM (Hoong, L. L., & Marthandan, 2011). As a result, this analysis will bring its hypotheses to the test based on (Järveläinen, 2013; Leong and Marthandan, 2014; Bakar, Azbiya Yaacob and Udin, 2015) as asserted below:

Table 1: Statement of Hypotheses

H_a:The Business Continuity management factors has a positive significant direct effect on the cost advantage
H_{a1}:The embeddedness of continuity practices has a significant direct effect on the IT infrastructure flexibility
H_{a2}: The technological turbulence has a significant direct effect on the IT infrastructure flexibility
H_{a3}:The embeddedness of continuity practices has a positive significant direct effect on cost advantage
H_{a4} :The technological turbulence has a significant direct effect on cost advantage
H_{a5}: The IT infrastructure flexibility has a significant direct effect on cost advantage
H_b: The Business Continuity Management factors has a significant indirect effect through IT infrastructure flexibility as a mediating on Cost advantage
H_{b1}: The embeddedness of continuity practices has a significant indirect effect through IT infrastructure flexibility as a mediating on cost advantage
H_{b2}: The technological turbulence has a significant indirect effect through IT infrastructure flexibility as a mediating on cost advantage

Since there is a direct and indirect effect, thus there will be a total effect:
H_c:The Business Continuity management factors has a significant total effect on cost advantage via the IT infrastructure flexibility
H_{c1}: The embeddedness of continuity practices has a significant positive total effect on cost advantage via the IT infrastructure flexibility
H_{c2}: The technological turbulence has a significant positive total effect on cost advantage via the IT infrastructure flexibility

5- The Conceptual Model

To verify the research hypotheses, the following conceptual model about the main effects of this study,isinroduced. Both embeddedness of continuity practices and technological turbulence are the exogenous variables in the model, while IT infrastructure flexibility plays the mediator, where it is believed that BCM factors depend heavily on IT infrastructure flexibility to sustain organizations' competitiveness. In other words, both exogenous effects are transmitted to the Cost advantagethrough the IT infrastructure flexibility

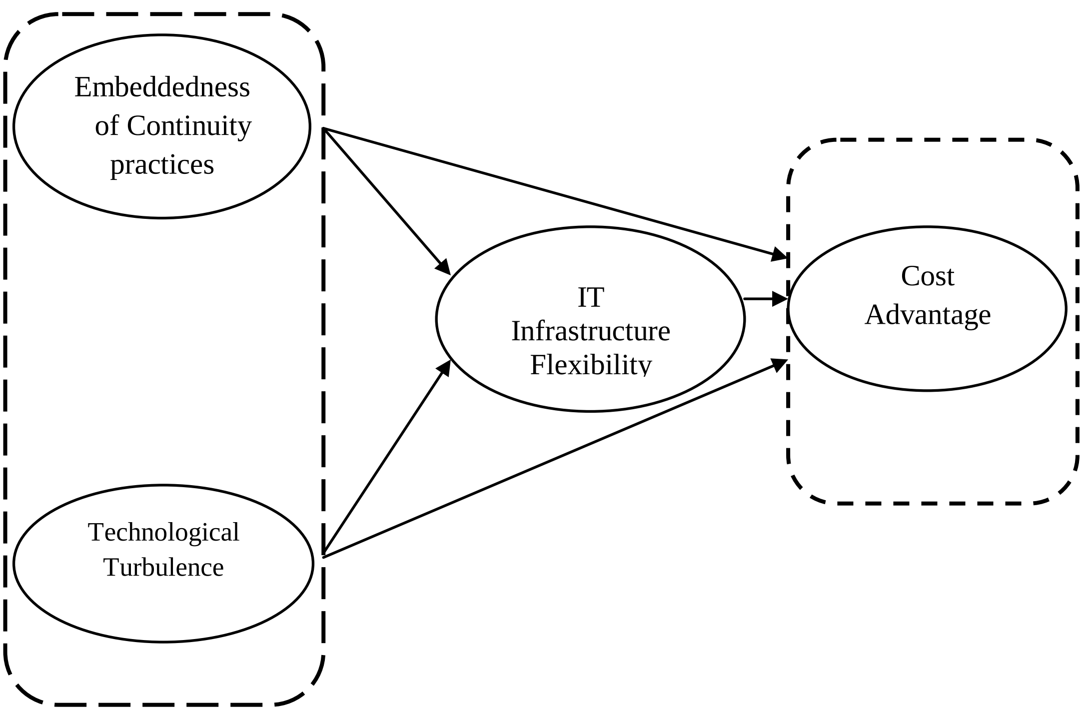

Figure 1: The Conceptual Model

6- Methodology

Secondary data was collected from various sources; textbooks, articles, previous literature, and organizations' websites (Hox and Boeije., 2005). In addition to that, primary data to test the hypotheses was collected via surgvey design and questionnair. The population of interest, mainly, includes senior and managerial levels in the four main service providers (operators) Vodafone, Etisalat, Orange, and Telecom Egypt companies. The study, also expanded its domain to include other Egyptian telecom service companies, such as Huawei and Ericsson. These companies are the main suppliers of Telecom equipment and have a significant part in the regular network operations and maintenance of the four operators. Factor analysis is used to examine the validity of the scale items and to check for the lack of discriminant validity between factors. While, the reliability which is a measure of internal consistency of the instruments was examined by Cronbach's alpha, reliability of 70% or more is deemed acceptable (Hair et al., 2010)

6- 1 Population and Sample

the population of this study is made up of all the Business Continuity Management and Disaster Recovery Planning subject matter experts from the telecom corporates. According to the National Telecom Regulatory Authority (NTRA), there are four main service providers (operators) Vodafone, Etisalat, Orange, and Telecom Egypt. Also, there are other Telecom service companies, such as Huawei and Ericsson, since they are the principal suppliers of telecom equipment and have a significant part in regular network operations and maintenance of the four operators, the population extended to it.

6.1.1 Sample Method

The method of sampling used in this study is random sampling which has been calculated according to the following equation (Rea, L. M., & Parker, 2014).

$$n = \frac{Z_{\frac{\alpha}{2}}^{2} P(1-P)}{E^{2}}$$

Where:

$Z^2_{\frac{\alpha}{2}}$ = Critical value of the normal distribution at the required confidence level,

p = Sample proportion,

E = Margin of error

The following assumptions were conducted when the size of the sample were estimated:

The required confidence level at 95% with $Z^2_{\frac{\alpha}{2}} = 1.96^2$ the sample proportion determined based on 50% as a conservative approach the margin of error within ((%5 ±

Accordingly, the estimated sample size without taking into account the size of the study population

n = $(1.96)^2 * (0.5)(1 - 0.5)/(0.05)^2 \approx$385 questionnaires

Although The questioner was distributed among 465 respondents who had some knowledge and work experience in the area of Business Continuity Management, Disaster Recovery Planning functions, Risk management department, and general IT subjects, only 316 are taken into consideration due to the 138 cases were deleted due to missing values as well as 11 additional cases of the sample numbers discarded for their unsatisfactory response. which represents about 70% respondent rate. A pilot sample of 47 questionnaires which represents 10% of the required sample was first distributed to test both the validity and reliability of the questionnaire and to identify the anticipated problems we may face during the fieldwork.

6- 2 Measurement

The current survey method is used wherever possible by this analysis. The established measurement scales were- tested according to widely recognized and standard methods, such as Churchill Jr (1979) proposed procedures. In particular, in a study that has established the instrument, we examined whether the reliability of an instrument was properly tested. We then investigated whether the validity check of the instrument had been carried out in the analysis, including content, determination, and convergent validity. For a better quality survey instrument, an instrument must be highly reliable and valid. The scales used for the constructs in this analysis are tailored to existing tools.

Firstly, the BCM factors adopted the more reliable and valid variables including, the embedding of continuity practices into the organization, and technological turbulence. Those variables measured using from three to five items five-point scale anchored by (1= Strongly disagree, 5= Strongly agree) developed by (Järveläinen, 2013 ; Jaworski and Kohli, 1993b). the embeddedness of continuity practices and the technological turbulence was at 91.7%, and 80.8% respectively. IT infrastructure flexibility was used as a mediator factor using five items five-point scale anchored by (1= Strongly disagree, 5= Strongly agree) develop by Chen et al., (2012) Cronbach's Alpha (α = 87.7%). While the reliability coefficient α was at 84.95% for the endogenous variable Cost advantage.

7- Results and Discussion

7.1 Sample Descriptive

The data were collected from 465 employees in the telecommunication industry in Egypt namely, Telecom Egypt, Etisalat, Vodafone, Huawei, Ericsson, and Orange companies. In the data preparation and purification stage, 138 Cases were deleted due to missing values.

Table 2: Sample Characteristics

Sample Characteristics	Descriptive	Frequency	Percentage
Age	22-40	232	70.9 %
	41-55	92	28.1%
	56-70	3	9 %
Total		327	100 %
Gender	Male	242	74.0%
	Female	85	26.0%
Total		327	100 %
Occupation	Senior	236	72.2%
	Manger	72	22.0%
	Chief Officer	19	5.8%
Total		327	100 %
Years of experience	1-5	124	37.9 %
	6-11	57	17.4 %
	12-17	67	20.5 %

Sample Characteristics	Descriptive	Frequency	Percentage
	18-23	65	19.9 %
	24 and more	14	4.3 %
	Total	327	100%

Table (2) shows a summary of the sample characteristics. It worth noting that 74.0% of the sample are male while 26.0% are female. The majority of respondents are between 22 and 40 years old. 72.2% of respondents were senior while 22.0% were managers and 5.8% are Chief Officer. Furthermore, out of 37.9 % of respondents have years of experience between 1 and 5 years meanwhile 20.5 % of respondents have years of experience between 12-17 years. These results are in favor of the study objective to survey experienced employees in the telecommunication context. Firstly, because BCM is being understood by senior management (Gibb and Buchanan, 2006; Foster and Dye, 2005). Second, senior management needs to take responsibility for BCM and play a competitive role in leadership instead of delegating to upper management (Deloitte, 2012).

7- 2 Factor Analysis for Data Reduction

Factor analysis is a statistical technique used to describe the variability among associated observed variables and possibly reduce the dimensionality to a lesser number of non-observed surrogated latent variables called constructs. The exploratory factor analysis procedure is used to reveal patterns among data. It is useful in removing redundancy between observed variables which is a very common problem in data modeling as a result of Multicollinearity between independent variables. The procedure has quite a few useful applications in data screening and classification analysis. The following table (3) presents the factor analysis of the main research dimensions in terms of the reliability of each dimension, its extracted variance (explained variance), factor loadings for each instrument, the sample average, its standard error, and the p-value while testing the average response is 3 (neutral).

Table 3: Factor Analysis for Data Reduction

Dimension	Extracted Variance	Reliability coefficient α	Factor Loadings	The Sample Average	The standard error	P-value
Embeddedness of Continuity practices	80.128%	91.7%		3.77	0530	0.000*
Em Cont1			.870			
Em Cont12			.906			
Em Cont13			.904			
Em Cont14			.900			
Technological Turbulence	72.002%	80.2%		4.44	0.039	0.000*
TechT1			.840			
TechT2			.856			
Techt3			.849			
IT infrastructure flexibility	73.447%	87.7%		4.01	0.048	0.000*
Flex2			.867			
Flex3			.882			
Flex4			.843			
Flex5			.835			
Cost advantage	76.895%	84.95%		3.82	0.049	0.000*
Com Adv2			.888			
Com Adv3			.900			
Com Adv 4			.841			

Reliability is a measure of internal consistency between instruments to ensure that they are directed to measure one thing. While the validity concepts are used to evaluate the quality of research. It is a common practice to accept the reliability of at least 65%. As shown in the above Table (3) all the reliabilities are $\geq 70\%$, which ensure an acceptable level of internal consistency between instruments measuring the construct. On the other hand, the explained variance is another measure of the quality of factors, it measures how much factors explain out of the total variability. Common practice suggests at least 60% explained variance for a factor to be accepted in the analysis. The table also includes the factor loadings, which reflect the degree of associations between each construct and its instruments. It is recommended to consider instruments that have at least a 50% correlation with a construct. We also report the sample average of each construct, its standard error, and the p-value when testing whether the average response in the population is 3 (the respondents are neutral towards the issue under consideration). As indicated in the table, the respondents are positive towards all issues (The averages are ≥ 3.82), with a significant p-value =0.000). The following table (4), gives details regarding the main statistical summary measures of the main constructs.

Table 4: Statistical Summary Measures of the Main Constructs

One-Sample t -Statistics					
Constructs	**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**	**P-value**
Technological Turbulence	316	4.44	0.699	0.039	0.000
Embeddedness of continuity practices	316	3.77	0.942	0.053	0.000
IT Infrastructure Flexibility	316	4.01	0.854	0.048	0.000
Cost advantage	316	3.82	0.869	0.049	0.000

7- 3 The Fitted Model

Having identified the most reliable and valid instruments to measure each construct, the researcher utilizes the LISREL software to build up the Structural equation Model (SEM). Several measures of goodness of fit indicates the model fits the data, including, Normed Fit Index (NFI) = 0.95,Non-Normed Fit Index (NNFI) = 0.94, Comparative Fit Index (CFI) = 0.96, Incremental Fit Index (IFI) = 0.96, Relative Fit Index (RFI) = 0.93, Critical N (CN) = 85.75, Root Mean Square Residual (RMR) = 0.058, Standardized RMR = 0.058 (recommended 0.05 and less), Goodness of Fit Index (GFI)= 0.84,(recommended 85% and above), Adjusted Goodness of Fit Index (AGFI) = 0.80, recommended at least 80%. See Hair et al. (2010) for details. From these results, it can be seen that the conceptual model of the study fits well by evidence of the various fit indexes, which are all within the required to fit.

Table 5: Covariance Matrix of ETA and KS

	It Infrastructure Flexibility	**Embeddedness of continuity practices**	**Technical. turbulence**	**Cost advantage**
It Infrastructure Flexibility	1.00			
Embeddedness of continuity practices	0.61	1.00		
P-value	0.000			
Technological. turbulence	0.76	0.62	1.00	
P-value	0.000	0.000		
Cost advantage	0.42	0.33	0.35	1.00
P-value	0.000	0.000	0.000	

Before discussing the casual relationship between the research variables, the researcher would discuss the nature of the association between them. Correlation coefficient r is a measure of strength and direction of linear association between pairs of variables $-1 \leq r \leq 1.$ is a measure of association between pairs of variables. It measures by its magnitude the strength of the relations, and by its sign the direction of the relations. As displayed in Table (5), there is a strong positive and significant correlation between Flex and Embeddedness of continuity practices($r = 0.61$, p-value = 0.000), strong positive and significant correlation between IT infrastructure flexibility and Technological Turbulence (r = 0.76, p-value = 0.000), and weak positive and significant correlation between It infrastructure flexibility and Cost advantages(r =0.42, p-value =0.000). Cost advantages has weak positive but significant correlation with embeddedness of continuity practices (r = 0.54, p-value =0.000), it has strong positive and significant correlation with Technological turbulence (r = 0.65, p-value = 0.000), and it has weak positive but significant correlation with Cost advantage(r = 0.39, p-value = 0.000). Finally, embeddedness of continuity practices has weak positive but significant correlation with Cost advantage(r = 0.35, p-value = 0.000).

7- 4 Composite Reliability (CR) and the Average Variance Extracted (AVE)

Composite reliability (CR) (Sometimes called construct reliability) is a measure of internal consistency in scale items, much like Cornbach α alpha (Niemeyer, 2003). It can be thought of as being equal to the total amount of true score variance relative to the total scale score variance (Brunner and Süß, 2005). On the other hand, the average variance, extracted (AVE) is another measure of the explained variance. It measures the amount of captured variance by the constructs relative to the total measurement variability due to measurement errors.

Having obtained the fitted model, which enjoy all the required characteristic of best fit, both composite reliability (CR), and average variance extracted (AVE) of each construct can be assessed. We would like to stress that Cornbach'sα, the reliability coefficient, given in Table (3), does not ensure the uni-dimensionality of the construct but contrarily assumes it exists (see Hair, et al., 2010 for details). Therefore, composite reliability (CR) which is a measure of internal consistency is a more reliable alternative measure and, is calculated, for each construct, by the following formula:

$$CR=\frac{(\sum \text{Standardized Loadings})^2}{(\sum \text{Standardized Loadings})^2+(\sum|\text{error}|)}$$

Composite reliability of 70% or more is deemed acceptable (See Hair et al. 2010, for details) While the average variance extracted measures the amount of variance that is captured by the construct in relation to the amount of variance due to measurement error and can be calculated using the following formula: (Fornell & Larcker). If the average variance extracted is less than 50%, then the variance due to measurement error is greater than the variance due to the construct. In this case, the convergent validity of the construct is questionable:

$$AVE=\frac{\sum (\text{Standardized Loadings})^2}{\sum(\text{Standardized Loadings})^2+(\sum|\text{error}|)}$$

Where standardized loadings are calculated from LISREL output and they measure the contribution of each instrument to the construct they represent.

Table 6: Composite Reliability and Average Variance Extracted

Construct	Composite Reliability (CR)	Average Variance Extracted (AVE)	R^2
Technological Turbulence	87.39%	69.78%	---------
Embeddedness of continuity practices	94.02%	79.75%	---------
IT infrastructure flexibility	94%	79.75%	62%
Cost advantage	89.1%	73.13%	54%

As illustrated in Table (6) all constructs have construct reliability exceeding the recommended cut-off of 70%, and also exceeding the average variance constructed of at least 50%. These results ensure both internal consistency and the convergent reliability of the measurement model. It is equally important to discuss the discriminant (DV) validity between constructs discriminant validity tests whether concepts or measurements that are not supposed to be related are actually unrelated. Discriminant validity of 85% or more is strong evidence of the presence of a lack of discriminant validity between the constructs. The discriminant validity is measured by:

$$DV_{A,B} = \frac{Corr(A,B)}{\sqrt{CR_A \times CR_B}},$$

Where, $Corr(A,B)$ is the correlation between the two constructs, CR_A and CR_B are the composite reliability of constructs A and B respectively.

Table 7: Discriminant Validity between Constructs

	It Infrastructure Flexibility	Cost advantage	Embeddedness of continuity practices
It Infrastructure Flexibility			
Embeddedness of continuity practices	65%	59%	
Technical. turbulence	83.85%	71.71%	
Cost advantage	45.89%	42.63%	39.66%

As shown in Table (7), no indication of the presence of lack of discriminant validity, since discriminant validity between pairs of constructs is less than 85%. This also a good sign of the good design of the questionnaire and the validity of the instruments. In the following section, we give a detailed account of the path analysis to verify the proposed research hypotheses which are considered the main objective of this study.

7- 5 Path Analysis and the assertion of Research Hypotheses

Although we have proposed the following hypotheses, we restate them in this chapter for the ease of checking their validity in the same section. As shown below we present three different sets of research hypotheses; set a is driven to discuss the direct effects in the model, while set b is proposed to discuss the indirect effects in the model, and final set c the total effects which additive effects of both direct and indirect effects.

Table 8 : Path Analysis and the Verification of Research Hypotheses

Construct	Path Coefficient	Standard Error	t-value	P-value	The Significance	The Hypotheses
The Direct Effect						
Embd. ⇨ Flexibility	0.58	0.06	9.30	0.000*	S	$Ha1$ is supported
TECH. ⇨ Flexibility	0.15	0.05	3.12	0.001*	S	$Ha2$ is supported
Embed. ⇨ Comp. Adv.	0.24	0.08	2.89	0.002*	S	$Ha3$ is supported
TECH ⇨ Comp. Adv.	0.09	0.05	1.78	0.038*	S	$Ha4$ is supported
Flexibility ⇨ Comp Adv.	0.43	0.08	5.16	0.000*	S	$Ha5$ is supported
The Indirect Effect VIA IT Infra Structural Flexibility						
Embed. ⇨ Comp. Adv.	0.25	0.05	4.57	0.000*	S	$Hb1$ is supported
TECH. ⇨ Comp. Adv.	0.06	0.02	2.69	0.004*	S	$Hb2$ is supported
The Total Effects						
Embed . ⇨ Comp. Adv.	0.48	0.07	6.93	0.000*	S	$Hc1$ is supported
TECH. ⇨ Comp. Adv.	0.16	0.05	2.87	0.002*	S	$Hc2$ is supported

*Means that the effect is significant at $\alpha \leq 5\%$.

7-5-1 Regarding Direct Effects

Direct effects are the impact of one construct on another when not mediated or transmitted through a third construct. It measures the extent to which the endogenous variable changes when the exogenous variable increases by one unit and the m ediator variable remain unaltered.

As shown in Table (8), The embeddedness of continuity practices has a 58% significant positive impact on the IT Infrastructure flexibility (p-value = 0.000), which verifies the hypothesis H_{a1}. Technological turbulence has a 15% significant direct effect on the IT infrastructure flexibility (p-value =0.001), which asserts the hypothesis H_{a2}.The embeddedness of continuity practices has a 24% significant positive impact on Cost advantages (p-value = 0.002), which supports hypothesis H_{a3}. Technological turbulence has a 9% significant direct effect on Cost advantages (p-value =0.038), which affirms hypothesis H_{a4}. Finally, IT infrastructure flexibility has a 43% significant direct effect on Cost advantage(p-value = 0.000), which defends the validity of H_{a5}.

7-5-2 Regarding the Indirect Effect

It can be defined as the impact of one construct on another construct via a mediator (which means that the effect of one construct is transmitted to another construct through a third construct). The above Table (8), exhibits the results of the direct effects of the exogenous variables (The embeddedness of continuity practices, and technological turbulence on Cost advantages via the IT infrastructure flexibility. As specified above, the Embeddedness of continuity practices has a 25% significant positive indirect effect on Cost advantage(p-value = 0.000), which proves the hypothesis H_{b1}. Finally, the technological turbulence has a 6% significant positive indirect effect on Cost advantages (p-value = 0.004), which substantiates the hypothesis H_{b2}.

7-5-3 Total Effects

The total effect is the effect of an independent variable on a dependent variable, whereas a mediator is a variable that accounts for the effect of an independent variable on a dependent variable (Baron and Kenny, 1986; Hayes, 2009; Preacher et al., 2016). It is the additive effect of both the direct and the indirect effect. The Embeddedness of continuity practices has a 48% significant positive total effect on competitive advance (p-value = 0.000), which authenticates the hypothesis H_{c1}. Finally, the technological turbulence has a 16% significant positive total effect on Cost advantage(p-value 0.002), which supports hypothesis H_{c2}.

7- 6 The Role of Mediation

The primary hypothesis of interest in a mediation analysis is to see whether the effect of the independent variables (Technological turbulence, and the embeddedness of continuity practices) on the outcome (Cost advantages) can be mediated by a change in the mediating variable(IT infrastructure flexibility). In a full mediation process, the effect is 100% mediated by the mediator, that is, IT infrastructure flexibility presence of the mediator; the pathway connecting the IT infrastructure flexibility to the Cost advantages is completely broken so that the exogenous variables have no direct effect on the Cost advantages. In most applications, however, partial mediation is more common, in which case the mediator only mediates part of the effect of the It infrastructure flexibility on Cost advantages, that is, the IT infrastructure flexibility has some residual direct effect even after the mediator is introduced into the model.

Table 9: The Mediation Analysis

Exogenous Variables	Outcome Variable With Mediation		Outcome Variable Without Mediation		Outcome Variable Total Effects	
	Effects	P-value	Effects	P-value	Effects	P-value
EMB.	25%	0.000*	24%	0.002*	48%	0.000*
TECHTUR	6%	0.004*	9%	0.038*	16%	0.000*
Total Effects	40%		43%		82%	

Clearly the results in Table (9) show the strong role played by the IT infrastructure flexibility in mediating the relationship between the business practices and the Cost advantages. As a final closing statement, IT infrastructure flexibility contributes 50% of the total effect on Cost advantages.

7- 7 Findings and Discussion

The main purpose of this study is to propose a framework through which we test the direct and the indirect linkage among the BCM factors, IT infrastructure flexibility, and the Cost advantage. The higher R^2 for all exogenous constructs demonstrates the high predictive power of the building model. Moreover, almost all the study hypotheses are "Accepted" (see table 8). There is abundant research that supports the finding that the embeddedness of continuity practices has a perceived business impact and contributes to preserving the organizations (Abdullah et al., 2015; Järveläinen, 2013; BIN, 2017; Bakar, Z. A., Yaacob, N. A., Udin, Z. M., Hanaysha, J. R., & Loon, 2019). The results of this analysis strongly emphasize this critical role. Moreover, from the perspective of business continuity, new business models represent technological contingencies that appear to threaten the business continuity of a company and therefore require organizations to make the necessary arrangements to preserve its value (Hoong, L. L., & Marthandan, 2011; Niemimaa *et al.,* 2019). Furthermore, from the Telecom industry experts' perspective, technological turbulence may help to recognize and identify challenges and vulnerabilities and IT infrastructure flexibility can easily and quickly respond to challenges and opportunities; thus, such two elements are likely to help an organization sustain its Cost advantage. The empirical results strongly emphasize this pivotal role.

Overall, consistent with Herbane et al. (2004), the study results emphasized the Business Continuity Management key role in maintaining the organization's Cost advantagein actively ensuring operational continuity where business continuity and strategic framework have been combined to provide integrated defensive and offensive capabilities for companies in their competitive environment. It supports the claim of "if the organization offers the same level of quality in such times, it can preserve a significant value among its competitors" (Herbane et al., 2004). It also supports the recognition of previous studies "when an organization effectively manages its risks, it successfully adapts to market-changing conditions, and minimizes profit variations" (Ja fari et al., 2011). Furthermore, the results align with Yiu, K., & Tsu (1995) argument that any critical operational failure can result in a deterioration in service quality and even in a financial loss if there is a significant duration or rating of business interruption. Finally, these findings correspond with the framework suggested by Bakar et al .2016 which depicts the effect of BCM factors on an organization's efficiency, as well as Järveläinen, (2013) research, which asserted the role of embeddedness the continuity practices in perceiving business impacts through his proposed model.

8 - Conclusion and Implications

The body of knowledge in Business Continuity Management can be reinforced as a result of what the study showed from additional empirical evidence that shows the positive significant impact of Business Continuity Management factors in preserving the Cost advantageof the Telecom corporates in Egypt. On the theory side, this research provides an elaboration to the previous works of the Business Continuity Management factors and those impacts in enhancing the Cost advantage. The IT infrastructure flexibility plays a strong role in mediating this relationship. Therefore; the BCM factors should not be separated from the IT infrastructure flexibility; they should be correlated with the affirmation of their value in the organization. On the practical side, the findings of this study provide new information to both the top management level and BCM managers which confirms the necessity of adopting the BCM factors. This makes the organization more able to take a shift, brace for uncertainties, and therefore continue to add market value in adverse circumstances.

8- 1 From a theoretical implication concern

This research makes a significant theoretical contribution to the BCM literature, as it introduces a comprehensive framework that displays new relationships between BCM factors and Cost advantage. It endorsed the significant total effect of BCM factors in enhancing Cost advantage. Moreover, the study extends the existing research on IT values by indicating the pivotal role of IT infrastructure flexibility in mediating the relationship between the BCM factors and organizations' Cost advantage. This is served in responding to the call "to unlock the mysteries of an increasingly important, but complex, set of relationships between IT investments and firm performance" (Sambamurthy et al., 2003, p. 256). Moreover, the research has a practical contribution as it tested the impact of technological turbulence as a BCM factor in preserving the Cost advantage.

Furthermore, this thesis responds to calls from many BCM researchers. (e.g, Sahebjamnia et al., 2018; Nasiren and Asmon, 2016; K. Venclova, H. Urbancova 2013; Sawalha 2011; Foster and Dye, 2005 and Herbane et al. 2004) by identifying the critical BCM factors and providing an empirical study in the various sectors of organizations, including the services sector. Besides, while several empirical works in the field of BCM were conducted in Malaysia. The U.K., U.S., West Africa and Europe (e.g Abdullah et al., 2015b; Woodman, P. and Hutchings, 2010; Woodman, 2008; Mouphtaou, 2014 ; Woodman, 2007; Herbane et al., 2004; Pitt and Goyal, 2004), Limited studies have been carried out in the Middle East (e.g.Sawalha, 2011) and almost none in Egypt. In a new line, this study focus on the Egyptian Telecom sector.

8- 2 From a practical managerial implications concern

To cope with the second wave of global economic crises, organizations should recognize that BCM is a key driver for enhancing corporate risk resilience and survival under excessive operational and environmental stresses. Firms should consider such BCM critical factors from a strategic perspective to fully reap the advantages of BCMS. This study serves to remind the organization's decision-makers of BCM is neither an application for business nor a separate framework for crisis management, but it should be embedded into the whole enterprise and be viewed at the strategic level. More consideration should be paid to build up a flexible IT infrastructure for its strong role in attaining business resilience. Moreover, for the Egyptian telecom organizations, new investment in the network became necessary to ensure the continuity of its operations.

9- Research Limitations and Suggestions For Future Research

- This is a cross-sectional study at one point in time; it develops based on a survey research methodology. Despite this approach contributed to the research results, it did not provide an opportunity to examine much deeper and core excessive BCM factors.
- Despite the Cost advantagevariables that are carefully recognized, and the researcher re-assured the reliability and the validity of the measurement scale

from the empirical results, the primary data could not adequately address the actual performance of it. Thus, the evidence is needed to verify such alternative measurement as complementary methods for further scales to be identified.

- The model in this study was proposed mainly for the Egyptian telecom sector, for that reason, and based on interviews the researcher considered technological turbulence as a new contributed factor to BCM. It, therefore, doubt that this factor is critical to other industries. It is recommended that future research should investigate the impact of those BCM factors in other business sectors such as banks as well as future studies could be conducted out using different techniques to evaluate the role of IT infrastructure flexibility as a mediating factor in the area of BCM

- Future works can be further focused on evaluating the impact of the COVID-19 pandemic from the business continuity and Cost advantageperspective.

References

Abdullah, N. A. S., Md Noor, N. L. and Mior Ibrahim, E. N. (2015a) 'Contributing Factor to Business Continuity Management (BCM) Failure– A Case of Malaysia Public Sector', *Proceedings of the 5th International Conference on Computing and Informatics, ICOCI 2015*, (Aug), pp. 530–538.

Abdullah, N. A. S., Md Noor, N. L. and Mior Ibrahim, E. N. (2015b) 'Contributing Factor to Business Continuity Management (BCM) Failure– A Case of Malaysia Public Sector', *Proceedings of the 5th International Conference on Computing and Informatics, ICOCI 2015*, (Aug).

Abu Bakar, Z., Yaacob, N. A. and Udin, Z. M. (2015) 'International Journal of Economics and Financial Issues The Effect of Business Continuity Management Factors on Organizational Performance: A Conceptual Framework', *International Journal of Economics and Financial Issues*, 5(5), pp. 128–134.

Bakar, Z. A., Yaacob, N. A., & Udin, Z. M. (2016) 'Performance : It Capability As Moderating', pp. 16–29.

Bakar, Z. A., Yaacob, N. A., Udin, Z. M., Hanaysha, J. R., & Loon, L. K. (2019) 'Business Continuity Management Implementation In The Malaysian Public Sector', i*nternational Journal of Business and Technology Management*, 1(1), pp. 18–27.

Bakar, Z. A., Azbiya Yaacob, N. ul S. and Udin, Z. M. (2015) 'Business Continuity Management Factors and Organizational Performance: A study on the Moderating Role of it Capability', *Journal of Management Info*, 2(3), pp. 5–12.

Baron, R. M. and Kenny, D. A. (1986) 'The Moderator-Mediator Variable Distinction in Social Psychological Research. Conceptual, Strategic, and Statistical Considerations, *Journal of Personality and Social Psychology*, 51(6), pp. 1173–1182.

BIN, M. D. 'ATIF (2017) 'A STRUCTURED CRITICAL SUCCESS FACTORS MODEL FOR BUSINESS CONTINUITY MANAGEMENT IMPLEMENTATION IN MALAYSIA SMEs', (c), pp. 2–6.

British Standards Institution (2006) *BS 25999-1 Code of practice for business continuity management. London:*

Brunner, M. and Süß, H. M. (2005) 'Analyzing the reliability of multidimensional measures: An example from intelligence research', *Educational and Psychological Measurement*, 65(2), pp. 227–240.

Byrd, T. A. and Turner, D. E. (2000) 'Measuring the Flexibility of Information Technology Infrastructure: Exploratory Analysis of a Construct', *Journal of Management Information Systems*, 17(1), pp. 167–208. Available at: https://pdfs.semanticscholar.org/0543/ c097487d93346fd0 4c0a068c992cf35cde5d.pdf.

Chen, H., Chiang, R. H. L. and Storey, V. C. (2012) 'Impact of Business Intelligence and IT Infrastructure Flexibility on Cost advantage: An Organizational Agility Perspective', *MIS Quarterly*, 36(4), pp. 1165–1188.

Chow, W. S. (2000) 'Success factors for IS disaster recovery planning in Hong Kong', *Information Management & Computer Security*, 8(2), pp. 80–87.

Churchill Jr, G. A. (1979) 'A paradigm for developing better measures of marketing constructs, *Journal of marketing research*, 16(1), pp. 64–73.

Deloitte, K. (2012) *Řízení kontinuity činností Business Continuty Management Business Continuty Management.*

Drewitt, T. (2013) *A Manager's Guide to ISO22301: A practical guide to developing and implementing a business continuity management system. IT Governance Ltd.*

Duncan, N. B. (1995) 'Capturing flexibility of information technology infrastructure: A study of resource characteristics and their measure', *Journal of Management Information Systems*, 12(2), pp. 37–57.

Foster, S. P. and Dye, K. (2005) 'Building continuity into strategy', *Journal of Corporate Real Estate*, 7(2), pp. 105–119.

Gibb, F. and Buchanan, S. (2006) 'A framework for business continuity management, *International Journal of Information Management*, 26(2), pp. 128–141.

Green, C. (2014) 'Measuring business continuity programs in large organizations, *Journal of business continuity & emergency planning, 8(1), 71-82.*, 8(1), pp. 71–82.

Hair, J. F., W. C. Black, B. J. Babin, and R. E. A. (2010) *'Confirmatory factor analysis.' Multivariate Data Analysis, 7th ed.; Pearson Education, Inc.: Upper Saddle River, NJ, USA.*

Hayes, A. F. (2009) 'Beyond Baron and Kenny: Statistical mediation analysis in the new millennium', *Communication Monographs*, 76(4), pp. 408–420.

Herbane, B. (2010) 'The evolution of business continuity management: A historical review of practices and drivers', *Business History*, 52(6), pp. 978–1002.

Herbane, B., Elliott, D. and Swartz, E. M. (2004) 'Business Continuity Management: Time for a strategic role?', *Long Range Planning*, 37(5), pp. 435–457.

Hoong, L. L., & Marthandan, G. (2011) 'Factors influencing the success of the disaster recovery planning process.A conceptual paper', in *International Conference on Research and Innovation in Information Systems*, pp. 1–6.

Hox, J. J. and Boeije, H. R. (2005) 'Data Collection, Primary vs. Secondary', *Encyclopedia of Social Measurement*, pp. 593–599.

Hurley-Hanson, A. E. (2006) 'Organizational responses and adaptations after 9-11', *Management Research News*, 29(8), pp. 480–494.

Itami, H., & Roehl, T. W. (1991) *Mobilizing invisible assets*, *Harvard University Press*.

Jafar, E. and Taneja, U. (2017) 'Determinants of Business Continuity Management in Hospitals', *International Journal of Critical Infrastructures*, 13(1), p. 1.

Jafari, M., Chadegani, A. A. and Biglari, V. (2011) 'Effective risk management and company's performance: investment in innovations and intellectual capital using behavioral and practical approach', *International Research Journal of Finance and Economics*, 3(15), pp. 780–786.

Järveläinen, J. (2013) 'IT incidents and business impacts: Validating a framework for continuity management in information systems, *International Journal of Information Management*. Elsevier Ltd, 33(3), pp. 583–590. Available at: http://dx.doi.org/10.1016/j.ijinfomgt.2013.03.001.

Jaworski, B. J. and Kohli, A. K. (1993a) 'Market Orientation : Antecedents', *Marketing*, 57(July), pp. 53–70.

Jaworski, B. J. and Kohli, A. K. (1993b) 'Market Orientation: Antecedents and Consequences, *Journal of Marketing*, 57(1), pp. 53–70.

K. Venclova, H. Urbancova, and H. V. V. (2013) 'Advantages and Disadvantages of Business Continuity Management, *International Journal of Industrial and Systems Engineering*, 7(4), pp. 895–899.

Kelly, M. (2012) 'Isolating CSF for Effective BCM-A Theoretical Review', j*ournal of Business Continuity & Emergency Planning*, 6(1).

Leong, L. H. (2014) 'Successful implementation of business continuity management in selected financial institutions Leong, L. H. (2014). Successful implementation of business continuity management in selected financial institutions (Doctoral dissertation, Multimedia Universit', (February).

Leong, L. H. and Marthandan, G. (2014) 'Critical Dimensions of Disaster Recovery Planning, *International Journal of Business and Management*, 9(12), pp. 145–158.

Lin, C. Sen, Kao, S. and Chen, L. S. (2012) 'A proactive operational framework for business continuity in the semiconductor industry', *Quality and Reliability Engineering International*, 28(3), pp. 307–320.

Lokey, W. M. (2009) 'SPECIAL FOCUS ON BUSINESS CONTINUITY-Don't Let the Plan Be the Disaster-Drawing on firsthand experience and studies of after-action reports from disasters around the United States, the author examines lessons learned and presents some of the most effective, 53(6), p. 70.

Low, S. P., Liu, J. and Sio, S. (2010) 'Business continuity management in large construction companies in Singapore', *Disaster Prevention and Management: An International Journal*, 19(2), pp. 219–232.

Mehrdad, A. (2011) 'Disaster recover/continuity of business adaptive solution framework.U.S. Patent 7,934,116, issued April 26, 2011.'

Mishra, A. N. and Agarwal, R. (2010) 'Technological frames, organizational capabilities, and IT use: An empirical investigation of electronic procurement', *Information Systems Research*, 21(2), pp. 249–270.

Mouphtaou, T. (2014) *Business Continuity Management For An Agribusiness Company: A Case Study From West Africa*.

Nashiruddin, M. I. (2018) 'Understanding the Turbulence of Business Environment in Telecom Industry: Empirical Evidence from Indonesia', *Buletin Pos dan Telekomunikasi*, 16(2), pp. 75–90.

Nasiren, M. D. A. and Asmoni, M. N. A. M. (2016) 'Critical Success Factors on the BCM Implementation in SMEs', *Journal of Advanced Research in Business and Management Studies*, 3(1), pp. 105–122. Available at: http://www.akademiabaru.com/arbms.html.

Niemimaa, M. *et al.* (2019) 'Business continuity of business models: Evaluating the resilience of business models for contingencies', *International Journal of Information Management*. Elsevier, 49(April), pp. 208–216.

Pitt, M. and Goyal, S. (2004) 'Business continuity planning as a facilities management tool', *Facilities*, 22(3), pp. 87–99.

Podaras, A., Antlová, K. and Motejlek, J. (2016) 'Information management tools for implementing an effective enterprise business continuity strategy', *E a M: Ekonomie a Management*, 19(1), pp. 165–182.

Preacher, K. J. *et al.* (2016) 'Addressing Moderated Mediation Hypotheses : Theory, Methods, and Prescriptions Addressing Moderated Mediation Hypotheses : Theory, Methods, and Prescriptions', *Multivariate behavioral*, 3171(June), pp. 37–41. Available at: http://www.tandfonline.com/doi/abs/10.1080/00273170701341316.

Rea, L. M., & Parker, R. A. (2014) *Designing and conducting survey research: A comprehensive guide*. John Wiley & Sons.

Sahebjamnia, N., Torabi, S. A. and Mansouri, S. A. (2018) 'Building organizational resilience in the face of multiple disruptions', *International Journal of Production Economics*, 197(December 2017), pp. 63–83.

Sambamurthy, V., Bharadwaj, A., & Grover, V. (2003) *Shaping agility through digital options: Reconceptualizing the role of information technology in contemporary firms*, *MIS quarterly*.

Sarkoni, S. F. M. (2012) *Simplified business continuity planning guideline for Universiti Teknologi Malaysia, center for information and communication technology*.

Sawalha, I. H. S. (2011) 'Business Continuity Management and Strategic Planning: the Case of Jordan', *University of Huddersfield*, p. 327. Available at: http://eprints.hud.ac.uk/10172/1/SawalhaIhab _Final Thesis.pdf.

Sawalha, I. H. S. (2013) 'Organisational performance and business continuity management: a theoretical perspective and a case study.', *Journal of business continuity & emergency planning*, 6(4), pp. 360–373.

Sekliuckienė, J., & Langvinienė, N. (2011) 'Gaining the Cost advantagein services: aspect of human resources. Ekonomika ir vadyba: aktualijos ir perspektyvos', 2(22).

Sharp, J. (2007) 'The route map to business continuity management.

Smith, S. (2005) 'Focus: Business continuity-Damage limitation-Stuart Smith reports on fire brigade and damage control partnerships', *Fire Prevention and Fire Engineers Journal*, pp. 50–53.

Tippins, M. J. and Sohi, R. S. (2003) 'IT competency and firm performance: Is organizational learning a missing link?', *Strategic Management Journal*, 24(8), pp. 745–761.

Torabi, S. A., Giahi, R. and Sahebjamnia, N. (2016) 'An enhanced risk assessment framework for business continuity management systems, *Safety Science*. Elsevier Ltd, 89, pp. 201–218. Available at: http://dx.doi.org/10.1016/j.ssci.2016.06.015.

White, C., & Turoff, M. (2010) 'Factors that influence crisis managers and their decision-making ability during extreme events. International Journal of Information Systems for Crisis Response and Management, *International Journal of Information Systems for Crisis Response and Management (IJISCRAM)*, 2(3), pp. 25–35.

Winkler, U. *et al.* (2010) 'A model-driven framework for process-centric Business Continuity Management', *Proceedings - 7th International Conference on the Quality of Information and Communications Technology, QUATIC 2010*, (1), pp. 248–252.

Wong, W. N. Z. (2019) 'Transforming corporate performance: A business continuity management approach', *Organizational Dynamics*. Elsevier Inc., 48(2), pp. 29–36. Available at: https://doi.org/10.1016 /j. orgdyn .2018.08.004.

Woodman, P. and Hutchings, P. (2010) '"Disruption & Resilience: The 2010 Business Continuity Management Survey', *Chartered Management Institute*.

Woodman, P. (2007) 'Chartered Management Institute 2007 BCM Survey', *Business Continuity Management*, (March).

Woodman, P. (2008) *Business Continuity Management 2008 Survey CMI Institute-Continuity Forum*.

Yiu, K., & Tsu, Y. Y. (1995) 'A model for disaster recovery planning, *IS Audit and Control Journal*, pp. 45–45.