

**e-Business Critical Success Factors: Towards the development of an
Integrated Success Model**

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Abstract

Purpose: e-Business (e-B) organization is an integrated synergy of Internet and supply chain (SC). It's an organizational environment which consists of associations among suppliers, customers, work force and information technology. An important issue for an e-B organization is the comprehension of the critical factors that affect its success, in order to realize its full advantages and how it results in efficiency improvements of the organizations. The purpose of this article is two-fold: first to identify the critical success factors (CSFs) that determine the successful implementation of e-B and second to develop an integrated e-B model based on the CSFs.

Design/methodology/approach: By following a quantitative approach, primary data were collected through a structured questionnaire from 174 Greek e-B firms. An initial Exploratory Factor Analysis (EFA) was conducted, followed by Confirmatory Factor Analysis (CFA) and Structural Equation Modelling (SEM).

Findings: Findings have shown that there was a direct association of the Resource Based View (RBV) on the Supply Chain View (SCV) of a firm, which in turn influenced the Performance/Results of an e-B organization. It is concluded that e-B performance results and value creation are linked to customers' and partners' orientation (SCV) and human resources and information technology (RBV).

Originality/value: The proposed framework contributes to our understanding of the successful implementation of e-B, by proposing a fifth-fold framework. The proposed framework portrayed a very fundamental result, that the Resourced Based View and the Supply Chain View of the organization are the critical priorities and have a direct and positive affect on the performance and efficiency of the successful implementation of e-B.

Keywords: e-Business, Critical Success Factors, Factor Analysis, Structural Equation Modelling, Resource Based View, Supply Chain Management, Integrated Model.

1 Introduction

Over the last decades, the Internet has offered a new range of communication possibilities, market penetration and growth. Many companies began to realise the related opportunities. Internet has simplified the existing business model and created a whole new market, which various firms had to conquer (Amit & Zott, 2001). All Internet users could easily be converted to new customers, generating even more profits. Businesses should be active and present in this area, disclosing their products to the global market. The immediacy offered by the Internet, enabled them to come into direct contact with potential customers and to build a new relationship of trust. The successful example of the first companies that exploited this opportunity has set an example for many others (Peters, 2001; Johnson et al., 2008). Thus, like a domino effect, companies have begun the struggle to conquer a place among the top of the Internet market.

The widespread use of Internet has signalled the beginning of several online activities like e-B. In particular, e-B introduced a new business model which established a set of business strategies to support specific business domains and to allow the accomplishment of trade actions with the use of electronic means (Afuah & Tucci, 2001; Porter, 2001). With a closer look, it is one of those rare cases, where changing market needs and new technologies are combined to revolutionize business activities. The e-B business model offers value to customers, to company architecture and to a network of partners, creating, promoting and distributing that value to produce more revenues (Osterwalder & Pigneur, 2004).

Electronic Business may be considered as a superset of online activities, such as electronic commerce (e-C), electronic banking (e-Banking), videoconferencing, telecommuting, remote work, or telework (e-Working). From a business strategy perspective, e-B encompasses a broader definition that includes customer relationship management (CRM), business partnerships, e-learning, and electronic transactions within an organization (Boundless, 2015).

Holsapple and Singh (2000) claim that e-B is an approach to achieve business goals, in which networked, computer-based technology for information exchange enables or facilitates execution of activities in and across value chains. Thus, e-B may be considered as a new business model with two major supporting components, e-strategy (e-S) and information technology (IT), which are responsible to maximize customer's value (Kalakota & Robinson, 1999). More specifically, e-S refers to the future steps and actions, plans and policies of a company to better achieve its objectives. e-S is essential not only for companies which aim to create commercial activities through the Internet but also for any modern organization (Chaffey, 2009). Few businesses will avoid becoming e-Businesses (Viehland, 2000). Therefore, e-strategy and business strategy now become synonymous, aiming to maximize a company's value.

All previous arguments suggest that the term e-B, as it is used in the current article, includes not only a specific operation within organizations but it applies to describe an organisation as a whole. In other words, it describes an organisation which produces services based in e-B processes.

However, the strategic advantage of any business seems to result from the efficiency and flexibility of its supply chain. Today's business environment, which is governed by specialization and globalization, requires cooperation among partner companies towards a common goal, in a sense that every partner is a link in an extended supply chain. Each partner

company performs different functions and synthesizes different relationships in the chain. In this extended organization, continuous information flow is the key aspect of the supply chain integration (Cooper et al., 1997). In fact, Johnson and Whang (2002) define e-B as the marriage between internet and supply chain integration. e-B creates an environment that includes several business parts and stakeholders such as suppliers, customers, competitors, work force, technology and community (Burke, 2014). The integration of all these business parts can be made possible through the use of communication networks, which allow collaboration among the various entities and functions of the supply chain. These communication networks are the core of e-B (Kocakulah et al., 2002). e-B as an integral part of corporate strategy and infrastructure empowers the competitive advantage of the supply chain partners and creates value and efficiency (Amit and Zott, 2001; Lee et al., 2002; Kushwaha, 2011).

Competitive advantage can be defined as the ability that has been acquired by the characteristics and the resources of an organization to operate at a higher level of efficiency and effectiveness compared to other competing companies in the same industry or market (Porter, 1985). Thus, e-B constitutes a very critical set of strategic actions which organizations intend to take to ensure their long term goals and objectives and to identify their related priorities. Kim (2013) points out that strategy fulfilment and competitiveness are associated with specific strategic priorities. Strategic priorities are the classification of strategic goals and objectives according to their importance in gaining a competitive advantage for the SC (Selldin & Olhager, 2007; Chopra & Meindl, 2012). All subsequent activities of SC, from design to distribution of final products, are based on these strategic priorities.

For the appropriate implementation of strategic priorities and the related allocation of necessary resources, senior management should identify and pay special attention to a number of Critical

Success Factors (CSFs) (Gates, 2010). CSFs are strongly related to the mission and strategic goals of any e-B organization. Whereas the mission and goals focus on the aims and what is to be achieved, CSFs focus on the most important areas of how this will be achieved. The identification of CSFs adds value to the planning process by revealing those variables that will most affect the success or failure in the pursuit of organizational or managerial goals (Bullen & Rockart, 1981). CSFs refer to elements that are vital for the success of any strategy. Determining CSFs can help organisations to translate their e-B vision into practical actions, investigate the applicability of strategic objectives, and review the effectiveness of their e-B strategy. Previous research has suggested that the CSFs of any information technology based initiative are primarily technological related elements (Chaffey, 2009). However, other studies have noted that defining CSFs for e-B implementation should not be limited to the consideration of the related technologies and systems, but also identify and consider CSFs related to people and processes (Chen et al., 2013).

As e-B is a rapidly evolving area, its successful implementation is still under investigation (Chen & Holsapple, 2013). Hence, organizations need to comprehend the CSFs that affect e-B, in order to realize its full advantages and how it results in organizations' efficiency improvements (Dubelaar et al., 2005; Jamil et al., 2012).

Despite the increasing work on e-B, literature lacks of an integrated approach for the development of a well-established e-B CSFs Model. As a result, more research is needed in order to better understand the CSFs that affect e-B implementation (Tsironis & Psychogios, 2012; Basu & Muylle, 2011; Li, 2005). Thus, the goal of this article is two-fold: first to identify the CSFs that determine the successful implementation of e-B and second to develop an integrated e-B model based on these CSFs.

In the current work, our approach has focused on finding a systematic way that enables the organisations to measure the level of e-B performance. This is why an appropriate framework is needed. The framework is a useful protocol of improvement opportunities, hidden weaknesses and suggestions in critical matters.

The remainder of the paper is as follows. Section 2 reviews the literature related to e-B CSFs and identifies the research constructs. Section 3 addresses the research methodology. Section 4 presents the results from the data analysis. Section 5 discusses the findings of the study. Finally, section 6 concludes the paper, presents the limitations and proposes areas for future research.

2 Literature review on e-Business Critical Success Factors (CSFs)

A thorough literature review was conducted in order to develop a complete set of e-B strategic priorities pointed out as the means for gaining competitive advantage. Literature has provided a set of practices that contribute to the successful performance and results of any e-B effort. These practices and critical success factors are discussed below.

According to Alshamlan (2006), who has reviewed the literature on e-Business CSFs, the following three factors are the most important: i) leadership commitment, ii) project management and iii) employee acquisition, retention and ownership. In their article, Huang et al. (2005), have carried out an empirical research on electronic Commerce (e-C) success factors and ended up in the following six factors: i) leadership, ii) strategy, iii) management, iv) organization, v) technology and vi) customer. As indicated by the results, strategy, technology and customer focus are the only factors that significantly affect e-C success. Li and Huang (2004) have explored the criteria that influence e-B success and proposed 57 critical factors classified in eight

categories: i) leadership, ii) management, iii) organization and competency iv) technology, v) customers and suppliers, vi) overall features and functions, vii) functions for customers and viii) function for suppliers.

Viehland (2000), in his research on the development of an e-B strategy, has identified the following six CSFs: i) create a consumer-centric strategy, ii) embrace outsourcing to improve business performance, iii) act like a new entrant, iv) use information management to differentiate your product, v) be a part of an e-B community and vi) focus on executive leadership. In his article, Phan (2003) has concluded that the most important success factors are: i) building and continuing to strengthen distinctive strategic position in the market, ii) building e-B to complement rather than cannibalize traditional ways of competing, iii) gaining support from top management, iv) focusing on quality of connections, v) providing worldwide support and customer training, vi) deploying the best security protections, vii) building and maintaining solid e-B architecture and viii) following good e-B project management strategies.

Kha (2000) has presented six CSFs that a company wishing to adopt e-B should consider: i) start with speed, ii) integrate the Web into the core of what the company does, iii) focus on how the company adds value for its customers, iv) make it easy for customers to do business with you, v) focus on improving customer's experience across channels of interaction and vi) convert a "click stream" into purchases. Subsequently, Dubelaar et al. (2005), have argued that the major factors for e-B success are: i) combining e-B knowledge and value proposition, ii) replication of offline brand, iii) building trust, iv) measuring performance and value delivery, v) customer satisfaction and retention and vi) monitoring internal processes and competitor activity.

e-B's goal is to succeed in satisfying customers by increasing their faith on the company, the maintenance of "good" customers and the attraction of new customers (Madu & Madu, 2003). In

this sense customer relationship management (CRM) is an important tool of e-B because it helps to identify customers' requirements and provide better customer services, through data collection and analysis (Madu & Madu, 2003). Harej and Horvat (2004) have distinguished seven CSFs for the successful implementation of CRM: i) assurance of top management commitment for CRM, ii) promotion of CRM across all departments and hierarchical levels in an organization, iii) understanding the connection and interaction among processes, iv) evaluation of the influence of software support, business rules and workflows on CRM effectiveness, v) consideration of new technologies in order to achieve business objectives, vi) consideration of employees importance and the importance of their training and vii) understanding of CRM implementation as a continuous process of change management. Basu and Muylle (2011) have developed an e-B process model in order to evaluate e-B firms' capabilities. Their model consisted of three levels (trade processes, decision support processes and integration processes) with numerous processes in each level. Madu and Madu (2003) have found that the dimensions that affect the quality of an integrated company which operates in the field of e-B, are: i) performance, ii) features, iii) structure, iv) reliability and v) security. Lee and Kozar (2006) have examined the impact of website quality on e-B success and found four major quality factors which are: i) information quality, ii) service quality, iii) systems quality and iv) vendor-specific quality. Finally, Chen et al. (2006) have developed a model in order to evaluate the IT sophistication of a company. The findings showed that the organizational factors of the measuring were: i) financial and technological resources, ii) top management support, iii) IT management maturity and iv) IT competency of human resources.

Literature has also revealed extensive work on the identification of e-B CSFs on organizations operational performance. As Terziovski (2002) claims, performance measurements are a

prerequisite to determining which aspects of an operation are good, bad or indifferent, and to setting priorities, for improvement. Moreover, Terziovski (2002), has suggested the following four factors as critical for performance improvement: i) use of Business Process Reengineering, ii) use of customer demand and needs as the main source of innovation in products and services, iii) use of suggestions from internal quality improvement groups and iv) the creation of a philosophy of continuous improvement and innovation.

Sanders (2007) has explored firms' use of e-B technologies and its relationship with intra and inter-organizational collaboration and organizational performance and found that e-B technologies affect performance both directly and indirectly. Barua et al. (2000), from their survey on e-B performance, have suggested eight key drivers for operational success: i) system integration, ii) customer orientation of IT, iii) supplier orientation of IT, iv) internal orientation of IT, v) customer-related processes, vi) supplier-related processes, vii) customer e-B readiness and viii) supplier e-B readiness. Barnes and Hinton (2008) have investigated how e-B activities of UK firms affect performance measurement systems. In their article they suggested that the following four factors are important and should be measured: i) the performance of the organization's website, ii) the performance of business processes, iii) the performance related to customers and iv) connection between E-B performance and business strategy.

Bremser and Chung (2005) have developed a framework for e-B performance measurement, and identified the following key metrics: i) source of value creation, ii) time lapse, iii) continuous versus discrete measures, iv) sensor technology, v) adaptive control model, vi) relevance to business model, vii) integration, viii) leading indicators, ix) uniqueness, x) risk relevance and xi) privacy and legal issues.

In their recent study, Tsironis and Psychogios (2012) have developed a conceptual e-B excellence framework based on a group of 12 criteria which are: i) leadership, ii) strategic planning, iii) processes, iv) marketing, v) knowledge and information management, vi) technology, vii) security, viii) orientation to customers, ix) orientation to collaborators, x) HR management, xi) research and development and xii) results. The authors pointed out that this framework should be used by companies as a self-assessment tool, to evaluate the aforementioned criteria and thus to improve their performance.

Apart from the enablers indicated in the EFQM Excellence Model (2010), another critical factor for a company to achieve excellence is the appropriate and continuous measurement of its overall performance, with regard to its goals. More specifically, successful performance measurement should include: i) data collection for measuring the results of core business performance, ii) comparison of basic performance results with other companies, iii) implementation of cause-effect analysis in order to explain basic performance results and iv) use of systems for measuring key performance indicators (KPIs).

As a result of the above literature review, forty bibliographic items were found to affect e-B and its performance success. We named the bibliographic items as individual CFSs. The issue we faced then is to distinguish the individual CFSs and group them in order to create a more flexible scheme to help the research methodology. Afterwards the authors and 15 e-B experts both from academia and business formed a brainstorming group, in order to classify the bibliographical evidence into affinity groups as proposed by Brassard (2010). The affinity method helps you organize into groups common themes from a large amount of information (Brassard, 2010). Finally, the team classified the forty bibliographic items in ten groups, namely: i) technology, ii) customers, iii) suppliers-partners, iv) personnel-managers, v) strategy, vi) operations, vii)

leadership, viii) knowledge and information management, ix) continuous improvement and x) performance measurement /results. The results are presented in Table 1. The first column of the table presents the names of the groups of CSFs as they originated by the experts and the affinity technique (Scott et al., 2005), based on their content and relationships. The second column presents the related individual CSFs, as they were detected in literature and the third column presents the authors who identified them.

Table 1: CSFs as identified in literature

Groups of CSFs	Individual CSFs (literature findings)	Authors
I. Technology	1. Provide appropriate infrastructure in the field of information technology. 2. Consider new technologies in order to achieve business objectives. 3. Help customers find the products and create online payment mechanisms. 4. Ensure security and privacy.	Li and Huang(2004) Huang et al. (2005) Harej and Horvat (2004) Basu and Muylle (2011) Barua et al (2000) Lee and Kozar (2006) Madu and Madu (2003) Phan (2003)
II. Customers	5. Assure easy and direct customers' communication with all services available to them (information, complaints etc) 6. Develop good relationships with customers. 7. Provide high quality product information to customers through companies' websites. 8. Identify customers' perceptions for products.	Barua et al (2000) Huang et al. (2005) Lee and Kozar (2006) Li and Huang(2004) Madu and Madu (2003) Harej and Horvat (2004)

III. Suppliers-Partners	<p>9. Embrace outsourcing to improve business performance.</p> <p>10. Develop good relationships and direct and easy communication with suppliers and partners.</p> <p>11. Share customer feedback, production schedules and capacity information.</p> <p>12. Ensure suppliers' & partners' e-B readiness.</p>	<p>Viehland (2000)</p> <p>Barua et al (2000)</p> <p>Li and Huang(2004)</p> <p>Phan (2003)</p>
IV. Personnel-Managers	<p>13. Encourage employees' ownership and commitment.</p> <p>14. Good use of IT from personnel and managers.</p> <p>15. Continuous training of personnel.</p> <p>16. Consideration of related IT skills in employee acquisition.</p>	<p>Alshamlan (2006)</p> <p>Chen et al.(2006)</p> <p>Li and Huang(2004)</p> <p>Harej and Horvat (2004)</p>
V. Strategy	<p>17. Create a consumer-centric strategy.</p> <p>18. Monitor competitors' activity.</p> <p>19. Use fast feedback and IT to improve adaptive actions (adaptive control models).</p> <p>20. Promote Website (Improve perception, brand and trust)</p>	<p>Viehland (2000)</p> <p>Bremser and Chung (2005)</p> <p>Dubelaar et al. (2005)</p> <p>Li and Huang(2004)</p> <p>Lee and Kozar (2006)</p>
VI. Operations	<p>21. Start with speed.</p> <p>22. Achieve internal orientation of IT applications.</p> <p>23. Monitor internal processes.</p> <p>24. Ensure that systems allow continuous monitoring of processes at various stages.</p>	<p>Le Kha (2000)</p> <p>Barua, et al. (2000)</p> <p>Dubelaar et al. (2005)</p>
VII. Leadership	<p>25. Realize that executive leadership is essential.</p> <p>26. Develop a clear vision for strategic decisions</p> <p>27. Set goals and define strategy</p> <p>28. Define roles and responsibilities.</p>	<p>Viehland (2000)</p> <p>Alshamlan (2006)</p> <p>Li and Huang(2004)</p> <p>Huang et al. (2005)</p>
VIII. Knowledge and Information	<p>29. Use of information management to differentiate products</p> <p>30. Application of specific models for data analysis.</p>	<p>Viehland (2000)</p> <p>Bremser and Chung (2005)</p>

Management	31. Collection and organization of internal and external data 32. Utilization of suitable technology for information's elaboration	Tsironis and Psychogios (2012)
IX. Continuous Improvement	33. Use of Business Process Reengineering (BPR) for the development of new strategies 34. Internal information sharing. 35. Innovation in products and services based on customers' demand. 36. Philosophy of continuous improvement and innovation.	Alshamlan (2006) Basu and Muylle (2011) Terziovski (2002)
X. Performance Measurement /Results	37. Data collection for measuring the results of core business performance. 38. Comparison of performance with traditional industry competitors. 39. Implementation of cause-effect analysis to explain basic performance results. 40. Use of systems for measuring key performance indicators (KPIs).	EFQM Excellence Model (2010) Dubelaar et al. (2005) Barnes and Hinton (2008) Madu and Madu (2003)

Literature review showed that although there has been a broad discussion concerning the critical success factors that lead to competitive advantage and improved e-B performance, there has been no significant effort on integrating all these factors, relating them and distinguishing the most important of them for improved performance and business results. In order to cover this gap, the present paper has gathered all critical factors presented in literature, focusing on their inter-relationships and contribution to e-B performance and results.

3 Research Methodology

3.1 Sample

The data of this research was collected through a structured questionnaire based on the literature review on e-B success factors. Questionnaires are considered an efficient method to collect data from the respondents, especially when the researcher knows what is required and how to measure the variables of interest (Zailani et al., 2012, p.334). Content validity was ensured through the thorough literature review, the results of which revealed a list of forty critical success factors, which are presented in Table 1. In order to further ensure the questionnaire's content validity, a pilot study was conducted with 15 e-B experts from academia and business. A 10-point Likert scale (with 1 'strongly disagree' and 10 'strongly agree') was used in order to allow respondents to report the extent to which they agree or disagree with each of the forty items of the questionnaire. The statistical population of the survey consisted of the total number of firms included in the three largest Greek data bases: Greek e-Commerce Association, Federation of Hellenic Information Technology & Communications Enterprises and Athens Chamber of Commerce and Industry. All companies in these databases were first contacted via email, asking them to provide us with a contact person responsible for their e-business, for research purposes. A total population of 322 firms responded to our request. All these companies were then contacted by phone and they were informed in more detail about the purpose of the research. For those companies that finally agreed to participate, a face-to-face interview was arranged to complete the questionnaire. Over the January 2014 and April 2014, 174 responses were collected with a response rate reaching 54%. This response rate is considered acceptable, as compared to other similar studies (Sung, 2006) and much higher than others (Sanders, 2007).

Figure 1 presents the e-B firms sample distribution according their business sector, firms mainly belonged to the travel and leisure sector (41%), including tour operators and agencies, car rentals and tickets. The second category of e-b firms was computer and retail stores (28%), followed by consumer goods (19%) including furniture. Supermarkets (9%) and Finance (2%) were the last two sectors of our sample.

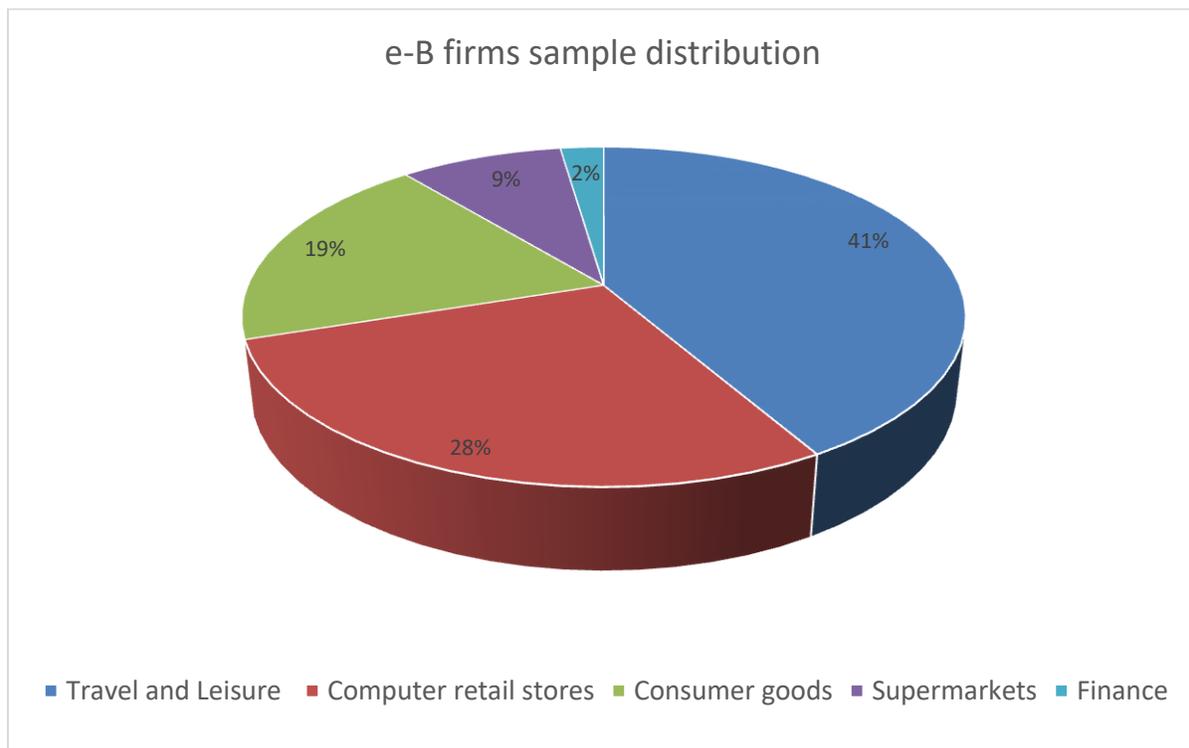


Figure 1: e-B firms' distribution according their business sector.

Table 2 lists the e-B firms sample according the payment method they offer. All 174 firms offer e-payment and e-banking services. These methods of payment, using credit and debit cards, are the most common worldwide. The majority of the rest of them (58 firms) offer additionally payment on delivery while 25 of the firms offer payment by telephone.

Table 2: Types of payment adopted by the sample e-b firms.

Type of payment	Number of firms
e-payment (American Express, Master Card, Visa, Paypal)	174
e-banking (Bank deposit)	174
Payment on delivery	58
Payment by telephone	25

3.2 Non-response bias and common method bias

In order to examine the sample for evidence of non-response bias, the linear extrapolation/wave analysis method was applied, as suggested by Armstrong and Overton (1977) and Atif et al. (2012). According to this method the 174 responses were divided into two groups: the early respondents (January and February, 2014) and the late ones (March and April, 2014). The gender (chi-square=0.133, degrees of freedom=1, p=0.715), the department (chi-square=1.309, degrees of freedom=5, p=0.934) and the position (chi-square= 6.902, degrees of freedom=5, p=0.228) of the early and late respondents were not statistically significantly different from each other. Therefore, non-response bias was not a major concern in this study.

Common method bias is another major validity threat in behavioural research (Podsakoff et al., 2003). To assure the absence of this phenomenon, the Harman's single factor test was used to examine whether a single factor explained more than 50% of the variance in the data. Principal component analysis with eigenvalues greater than one was used to extract the factors. The results showed that 11 factors were responsible for 73 % of the variance, while the first factor explained only 35.23% (<50%) of the variance, proving the absence of common methods bias in our study.

3.3 *Method of Data Analysis*

In the current work, an initial exploratory factor analysis (EFA) was conducted to summarize relationships among the large number of individual CFSs (served as variables in the factor analysis) with a comprehensive and accurate way to help to collect information on the underlying, latent structures (i.e. factors). The EFA helped us to realize that an array of forty individual CFSs represents only five key latent variables, called factors of critical success practices.

Then, confirmatory factor analysis (CFA) was applied in order to confirm the existence of specific pattern of relationships between observable variables and factors.

Factor analysis is the most indicative way which helped us to distinguish the most important CFSs for e-B success, among an unformatted number of individual CFSs.

Finally, structural equation modelling (SEM) was conducted in order to examine the structural relationships between the extracted factors. SEM has also been used in previous e-B studies (Sanders, 2007) and it was considered an appropriate tool for this analysis.

The data analysis for this study was conducted using the IBM SPSS 21 (IBM Corp. 2012a) and AMOS 21 (IBM Corp. 2012b) software and it is described in detail in the next paragraph, together with the results of the study.

In summary we can say that factor analysis (exploratory and confirmatory) interprets and examines the relationship between a large number of variables by distinguishing them in factors that affect and determine the nature and evolution of the original variables. The resulted factors enable us to discover the deeper relationships between other variables and factors and also to give meaning and entity to each factor separately.

4. Results

In order to determine construct reliability, the Cronbach's coefficient alpha was calculated. The dataset had a Cronbach's alpha value of 0,944, above 0.7, which indicated the reliability of the data (Oliveira & Martins, 2010).

Factor analysis was applied to the data, in order to identify the critical success factors of the final model. Factor analysis is a data reduction method which removes redundancy or duplication from a set of correlated variables (Pallant, 2005). It represents the correlated variables with a smaller set of derived factors, which are relatively independent of one another (Thompson, 2004). It results in two types of variables, latent variables and observed variables. Latent Variables are variables that are not measured directly but are inferred through the relationships, or shared variance, of a set of observed, namely measured, variables. A large number of observable variables can be aggregated to represent an underlying concept (Tabachnick & Fidell, 1996). Factor analysis uses two types of measurement models Exploratory and Confirmatory (Suhr, 2006).

First, Exploratory Factor Analysis (EFA) was conducted to extract the latent constructs. EFA examines and explores the interdependence among the observed variables and explains a maximum amount of variance (Thompson, 2004). EFA determines the factor structure, examining the covariance between the observable variables, in order to gather information on the latent structures called factors. The model that is derived through EFA shows the connections between observable variables and factors, called loadings, and the pattern of correlations between the factors (Henson & Roberts 2006). The high Kaiser-Meyer-Olkin score of 0.860, as well as the acceptable Barlett's test of sphericity (4872.303, $p=0.000$) strongly validated the

sample size adequacy and confirm the suitability of EFA for this data. The method distinguished the five resulted CFSs with eigenvalues greater than 1, explain the 57,543 per cent of the total variance. Using e-B experts' opinions and the affinity method (Brassard, 2010), we named the factors as follows: *Factor 1: Performance Measurement & Improvement*, *Factor 2: Partner Orientation*, *Factor 3: Customer Orientation*, *Factor 4: Information Technology Resources (ITR)*, and *Factor 5: Human Resources (HR)*. In particular, the first factor, namely “Performance Measurement & Improvement”, which explains the 34,379 per cent of the total variance, is the dominant factor extracted from EFA (see Table 3).

Table 3: Total Variance

Component	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total
1	13.752	34.379	34.379	12.090
2	2.985	7.463	41.842	6.316
3	2.580	6.449	48.291	2.846
4	1.981	4.953	53.244	2.908
5	1.720	4.300	57.543	6.121

Table 4 depicts the five CSF’s and their components as they extracted from the application of EFA method. Rows in table 4 list the individual factors as they named before the application of the EFA. After the application of EFA, the individual factors comprise the component of each factor. Factor loadings were used in order to assign items to each factor. Factor loadings indicate the strength of the relationship between the value of loadings and the factor. Hair et al. (2010), suggest that in a sample of 200 respondents a value of 0.40 and above, is considered significant. In fact, the highest the factor loading, the stronger the relationship is between the observed

measure and the unobserved factor. In our case, with a sample of 174 respondents, factor loadings greater than 0.459 were accepted, except only for one item (q44 = 0.436) which was close to the accepted value. This helped to decrease the total number of items from 40 to 31 and to group them into 5 factors. The name given to each factor was based on the “descriptive approach”, reflecting the nature of the items that belong to it.

Table 4 presents the items comprising each factor and the related factor loadings. Every item was assigned with a code name, which appears in parenthesis, for the purposes of the analysis. The coding of the items was based on the initial questionnaire’s groups of priorities. For example, q104 is the fourth (4) question of group X (10) of CSFs (see Table 1).

Table 4: Factor Loadings

Factors	Factor Loadings
Factor 1 (Performance Measurement & Improvement)	
Use of systems for measuring key performance indicators (KPIs). (q104)	.782
Implementation of cause-effect analysis to explain basic performance results. (q103)	.775
Realize that executive leadership is essential. (q71)	.757
Use of Business Process Reengineering (BPR) for the development of new strategies. (q91)	.742
Data collection for measuring the results of core business performance. (q101)	.731
Philosophy of continuous improvement and innovation. (q94)	.715
Internal information sharing. (q92)	.712
Setting goals and defining strategy. (q73)	.686
Monitoring internal processes. (q63)	.681
Develop a clear vision for strategic decisions. (q72)	.673

Ensure that systems allow continuous monitoring of processes at various stages. (q64)	.671
Define roles and responsibilities. (q74)	.670
Innovation in products and services based on customers' demand. (q93)	.659
Achieve internal orientation of IT applications. (q62)	.623
Comparison of performance with traditional industry competitors. (q102)	.614

Factor 2 (Partner Orientation)

Ensure suppliers' & partners' e-B readiness. (q34)	.744
Share customer feedback, production schedules and capacity information. (q33)	.672
Develop good relationships and direct and easy communication with suppliers and partners. (q32)	.533
Start with speed. (q61)	.507

Factor 3 (Customer Orientation)

Provide high quality product information to customers through companies' websites. (q23)	.774
Identify customers' perceptions for products. (q24)	.763
Develop good relationships with customers. (q22)	.751
Assure easy and direct customers' communication with all services available to them (information, complaints etc). (q21)	.714

Factor 4 (Information Technology Resources)

Consider new technologies in order to achieve business objectives. (q12)	.654
Promote Website (Improve perception, brand and trust). (q 54)	.620
Help customers find the products and create online payment mechanisms. (q13)	.527
Provide appropriate infrastructure in the field of information technology. (q11)	.519

Factor 5 (Human Resources)

Continuous training of personnel. (q43)	.849
Good use of IT from personnel and managers. (q42)	.762
Encourage employees' ownership and commitment. (q41)	.659
Consideration of related IT skills in employee acquisition. (q44)	.436

Next, Confirmatory Factor Analysis (CFA) was applied to further validate the measures for all the factors considered in this study (Prajogo et al., 2012). CFA tests specific hypotheses about the factorial structure of the observed variables. It imposes theoretically interesting constraints on the model and examines the resulting fit of the model to the observed data according to a number of tests and indices (Brown, 2006). CFA specifies the number and the pattern of latent factors. CFA plays an important role in structural equation modeling. In doing so, the goodness of fit of the model to the measured data was established. All the related indices were within the acceptable values, including Chi-square to degrees of freedom ($\chi^2/df = 1.723$), root mean square error of approximation (RMSEA = 0.057), comparative fit index (CFI = 0.934), Tucker-Lewis index (TLI = 0.920), incremental fit index (IFI = 0.936) and normed fit index (NFI = 0.840). Those values indicate an acceptable fit of our model to our data (Hair et al., 2010; Hu and Bentler, 1999). From the above, it is apparent that the results consistently support the structure of the latent factors revealed as discussed earlier in the EFA stage (Bayraktar et al., 2009).

Since all fit indices were acceptable, SEM was applied to examine the causal relationships between e-B CSFs. Structural Equation Modelling (SEM) enables researchers to construct models of putative causal relations, and to test those models against data. It is based on multiple regression and factor analysis to explain the relationships among multiple variables (Hair et al., 2006). Compared with other multivariate analyses, SEM extends analysis in at least two important ways. First, SEM allows researchers to model the relationships among variables after accounting for the measurement error. Second, SEM provides tests for goodness-of-fit which is a very important aspect to test whether the sample data supports the hypothesis tested in the model (Cunningham, 2008).

Structural equation models were created using confirmatory factor analysis with AMOS. SEM results consist of two models: A measurement model and a structural model. The measurement model tests the accuracy of the proposed measurements by assessing the relationships between latent variables and their respective indicators (Skrondal & Rabe-Hesketh, 2005). Indicators are the observable variables of the model. Namely, they are the ingredients of each factor of the model. The structural model then specifies relations among latent variables and regressions of latent variables on observed variables, using path analysis (Bacon, 1997).

An extra feature in AMOS is the ability to do a specification search. This feature helps the researcher to allocate certain paths in the model to be optimal. AMOS then fits the model to the data using every possible subset of paths (Kline, 2010). The models are subsequently sorted according to their fit to the data based on particular fit statistics. The final best fitting model is being chosen (Hoyle, 2011). Using AMOS' Specification Search, an initial structural equation model was first set with all possible paired links between the five factors. AMOS ran all possible paths of the initial model and gave us the model with the best results, using the following fit function criteria: Akaike Information Criterion (AIC = 0.000), Browne-Cudeck Criterion (BCC = 0.000) and C/df = 1.723 (Schumacker, 2006). The structural equation model with the best overall fit is presented in Figure 2.

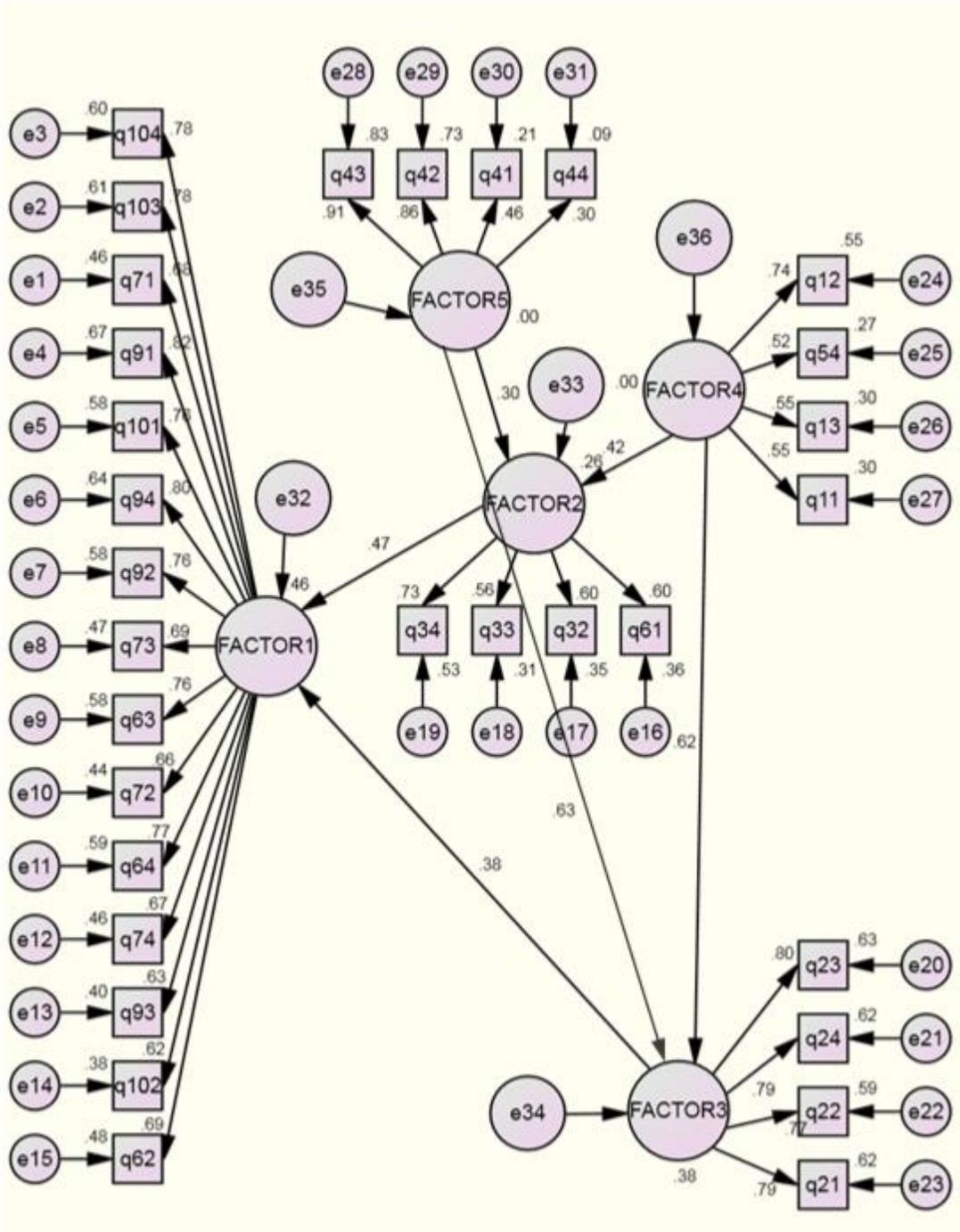


Figure 2: Structural Equation Model

The above model represents the estimated causal relations between the latent factors. In the final model diagram, latent variables (unmeasured variables) are shown in bigger circles and

questionnaire items used to measure these latent constructs (measured variables), are shown in rectangles. Arrows pointing from the circles to the rectangles were equivalent to factor loadings in factor analysis. All loadings were above 0.50 which meant statistically significant associations. Arrows connected the latent variables (factors) represented correlations among these factors. More discussion on the correlation among factor would be given in figure 3. It is shown that “Partner Orientation” (Factor 2), “Customer Orientation” (Factor 3), “Information Technology Resources” (Factor 4) and “Human Resources” (Factor 5) have four indicators each, namely, four observed variables, while “Performance Measurement & Improvement” (Factor 1) has 15 observed variables. Values on observed variables represent the squared multiple correlation coefficients (or R^2). These values describe the amount of variance explained from each factor and caused from observed variables. The remaining variance (unexplained) was considered as measurement error (e), which are shown in small circles in Figure 2. Arrows pointing from the errors to the measured variables (rectangles) show the unexplained variance. Because the explained and unexplained variance of a variable must equal 100%, we also know how much of the variance of each measureable variable is error (Bowen & Guo 2011). For example, factor 3 explains 63% of the variance caused from variable (questionnaire item) q23. The remaining percentage of 37%, represents the error rate (e20).

All factors (latent variables) are connected with arrows, the direction of which indicate their association. As it can be seen factors have direct and positive associations. Specifically, Information Technology Resources (factor 4) and Human Resources (factor 5) have a direct and positive impact on factors “Partner Orientation” (factor 2) and “Customer Orientation” (factor 3). Both factors two and three have a direct and positive impact on “Performance Measurement & Improvement” (factor 1). Values between ± 0.10 and ± 0.29 considered weak. Values between

± 0.30 and ± 0.49 considered mediocre and Values between ± 0.50 and ± 1 considered strong (Pallant, 2005).

The final model depicts that “Information Technology Resources” and “Human Resources” influence “Partner Orientation” and “Customer Orientation” which in turn influence the final and most important factor of the model which is “Performance Measurement & Improvement”.

5 Discussion of Results

Data analysis revealed five CSFs underlying e-B success. The first factor, “*Performance Measurement and Improvement*”, involves performance analysis in all areas of a company, encouraging improvement and innovation and creating value for the company. EFA grouped the component internal orientation of IT in the current factor. We maintain the name of the component as it had been located in the literature. The authors of the corresponding bibliographic evidence Barua et al. (2000) in their article, proved that e-B companies, that invest in and commit to internal orientation of IT, achieve better financial performance. This component aims at providing online internal services such as administrative processes, dissemination of best practices and financial information, is connected with improvements in the e-B organisation and good overall performance. This factor is consistent with Terziovski (2002) who has found that the philosophy of continuous improvement and innovation is one of the CSFs of operational performance. This factor actually represents the long-term performance and value creation of an e-B organization. Every organization seeks to perform good results in terms of value creation, efficiency and innovation. Thus, the final model’s factor “Performance Measurement and Improvement” represents the overall Value Creation of an e-B organization.

The second factor, “*Partner orientation*”, refers to the selection of the appropriate partners, and the effective and efficient cooperation within the supply chain. This factor is in line with previous studies. For example, Barua et al. (2000) have indicated the importance of careful selection of partners. Likewise, Tsironis and Psychogios (2012) have argued that orientation to collaborators is one of the criteria that need to be addressed in the e-B excellence course of action. Another component who may rise questions regarding its place “inside” the current factor is the speed component. As Kha (2000, p. 27) points out, “speed must integrate into all aspects of a company: its decision-making process, its training, its attitude toward risk and failure, as well as its management style”. A failure to select the right partner, is possible to decrease the speed of an e-B organisation’s activities and as a result the customer services speed.

The third factor, “*Customer orientation*”, refers to the way a company identifies and satisfies its customers’ requirements for its products and/or services. Many researchers have highlighted the importance of customer orientation (Tsironis & Psychogios, 2012; Barnes & Hinton, 2008; Dubelaar et al., 2005; Huang et al., 2005; Li & Huang, 2004; Phan, 2003; Terziovski, 2002). According to Barua et al. (2000), customer orientation of IT customer-related processes and customer e-B readiness play a key role in operational success. Kha (2000) have claimed that e-B companies should focus on ways to add value to their customers, on improving customer’s experience across all interaction channels and on making it easy for customers to do business with them. Successful suppliers’ and customers’ relations and the development of the related supporting resources within the Supply Chain is a key issue of SCM. SC is a system of business enterprises that link together in order to satisfy customers’ demands (Riddalls et al., 2000). It is an aggregation of operations, including purchases, production and distribution among customers and suppliers.

The above two factors of the final model, “Partner Orientation” and “Customer Orientation”, may be considered as the Supply Chain View (SCV) of the entire e-B organization.

The integration of the supply chain can be achieved through the control and coordination of all the resources and activities involved in the chain operations. Businesses participating in the integrated chain must have an extremely flexible system to manage their internal resources and also to have the ability to communicate with the respective systems of the members / companies that make up the chain. By integrating the complete supply chain under the philosophy of e-B, they can achieve optimization of the entire circuit and synchronous centralized control of all sub-funds of the companies that make up the chain in order to optimize the overall performance of the supply chain (Lee & Whang 2003; Smart 2008). Electronic Business aggregates business activities and Information and Communications Technology (ICT) in an efficient and flexible way, to work closely with Supply Chain (SC) members in order to better satisfy the needs and expectations of customers and gain competitive advantage. Furthermore, Cannella et al. (2014, p. 2327) have suggested that an *“IT-enabled supply chain improves operational performance and customer service level”*.

The fourth factor refers to *“Information Technology Resources”*. This factor describes the importance of IT infrastructure on the performance of the whole organizational system. This factor is consistent with Harej and Horvat’s (2004) findings which reveal that considering new technologies may lead to the achievement of business objectives. We would like to further justify why the component “help customers find the products and create online payment mechanisms” found placed among the components of the current factor. Helping customers find the product and online payments are very important IT resources. In 1998, Amazon acquired Junglee and NetPerception, a tool and an intelligent agent software that helped customers find products (Kha,

2000). Moreover, online payment mechanisms with the use of technologies, such as object-oriented systems and eXtensible Markup Language (XML), “help firms integrate their information systems to enable automation of tasks across different component information systems, (Basu and Muylle, 2011, p. 439).

Finally, the fifth factor revealed the importance of “*Human Resources*”, which constitutes of all the actions that must be taken in order to increase the productivity and efficiency of the personnel. Our findings are consistent with Harej and Horvat’s (2004) study, where they have pointed out that the personnel is the critical component of customer relationship management. Finally another component which placed, inside the current factor and needs further explanation is the “good use of IT from personnel and managers”. IT competency of human resources is considered one of the factors that affect e-business innovations. Maintaining qualified IT managers and personnel is critical for firms that want to achieve competitive advantage. (Chen et al., 2006).

The exploitation of an organization’s internal resources and capabilities, such as information technology and human resources, lies in the very heart of the Resource Based View (RBV) theory (Wernerfelt, 1984). RBV promotes the development of competitive advantage and the improvement of organizational efficiency through the analysis of firms’ resources (Wernerfelt, 1984; Barney, 1991; Shapiro, 1999). RBV also allows firms to identify factors that affect competitive advantage (Schoenherr, 2012; Wu et al., 2008). According to the RBV theory, enterprises can be regarded as a set of resources and capabilities (Barney, 1991). In fact, every organization is a collection of specific resources, bringing together a number of valuable, rare, inimitable and irreplaceable features and abilities that it has to exploit (Barney, 1991; Day, 1994). A firm’s performance is empowered when it embeds e-B capabilities (Teece et al., 1997).

Thus, RBV enables firms to leverage their investments in IT and e-B, in order to create unique capabilities that will determine the overall e-B effectiveness and lead to unique competitive advantage (Zhu, 2004).

Thus, the two factors of the final model, “Information Technology Resources” and “Human Resources”, represent the hard and the soft elements of the entire e-B organization and express the Resource Based View (RBV) of an e-B organization.

All the above are summarized in the proposed model presented in figure 2. The model detects the CSFs, groups them in five main categories and explains the relationships among them, based on the RBV and SCV theory. The model integrates RBV, SCV and overall e-B Performance/Results (e-B P/R) and serves as the basis for the interpretation of the final SEM model of e-B CSFs into a holistic integrated model. By embedding the Structural Equation Model that emerged from the statistical analysis (figure 2) in the proposed integrated model (figure 3), it is shown that there is a direct association of the Resource based View (RBV) on the Supply Chain View (SCV) of a firm, which in turn influences the P/R of an e-B organization. This idea is consistent with that of Johnson and Whang (2002), who has argued that e-B is the integration of Internet and SC. The integration of these two expresses the coordination of resources, technology, operations and methods towards a common goal, business performance improvement and value creation. In the same direction, Melville et al., (2004) and Dehning and Richardson (2002), have shown that IT resources, contextual factors and organizational resources, have a direct effect on business processes and finally on organizational performance.

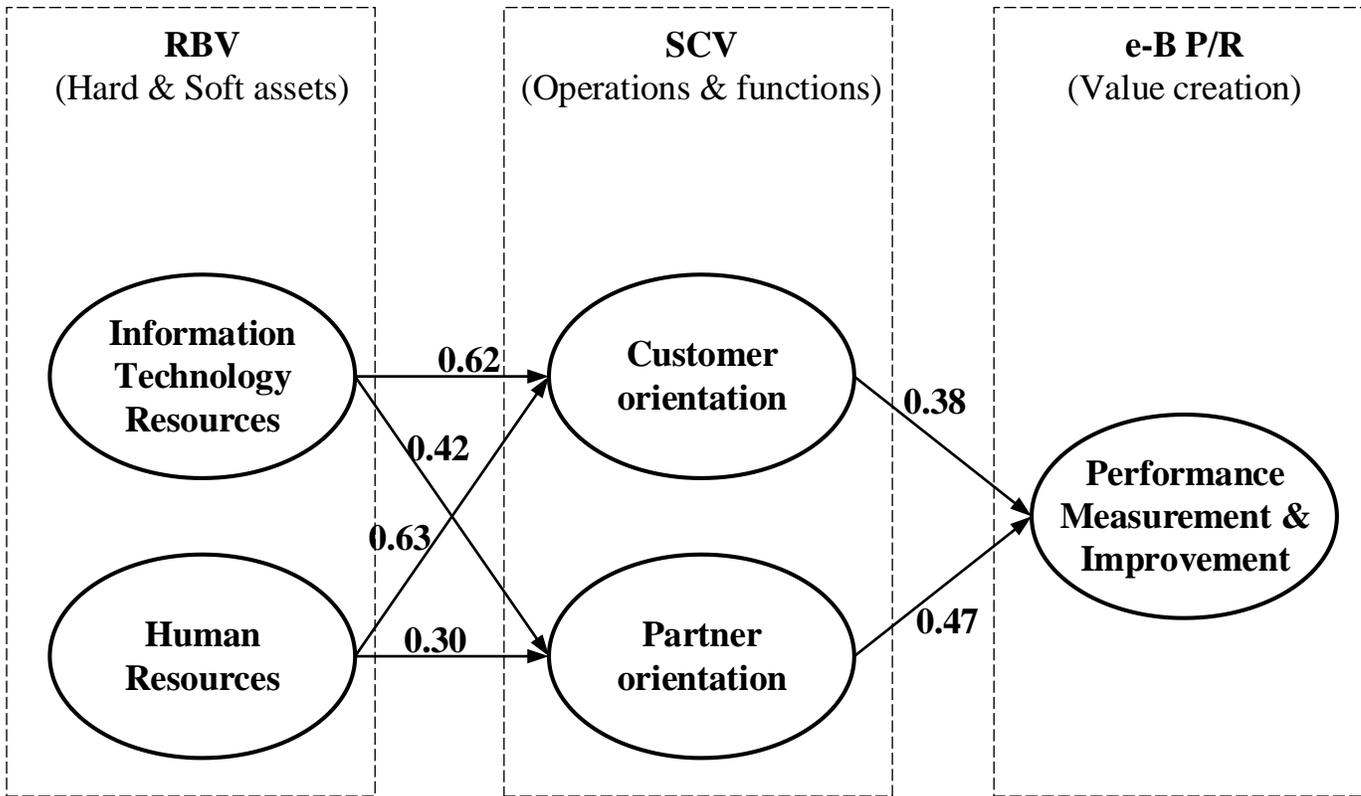


Figure 3: e-B CSFs Proposed Integrated Model

6 Conclusions

This research will contribute to a better and more comprehensive understanding of CSFs on e-B performance and will help professionals to manage them better, increasing the chances of successful implementation.

On the practical side, the significance of this research is that the results can deepen the understanding of the implementation of e-B activities. Such deeper understanding could lead to these key areas of activities should receive constant and careful attention from management in order for the better measurement of the level of e-B performance, which in turn, reveal the specific areas that should be continually measured and the information should be made

accessible for management's use in terms of improvement opportunities, hidden weaknesses and suggestions in critical matters.

To that direction CSFs are integral to the achievement of company goals. Without such factors, businesses have no roadmap by which to navigate their operations. Bullen and Rockart (1981) argued that CSFs are the few key areas where "things must go right" for the business to flourish and for the manager's goals to be attained. CSFs are the critical factors or activities required for ensuring the success of e-B. They have been used significantly to present or identify a few key factors that organizations should focus on to be successful. The limited number of areas in which satisfactory results will ensure successful competitive performance for the individual, department, or organization. Identifying CSF's is important as it allows firms to focus their efforts on building their capabilities to meet the CSFs, or even allow firms to decide if they have the capability to build the requirements necessary to meet CSFs.

The results of the current work suggested that by focusing on "Information Technology Resources", "Human Resources", "Partner Orientation" and "Customer Orientation" it results on e-B "Performance Measurement & Improvement" and enhances the competitiveness of the organization and on the satisfaction of the stakeholders.

A general conclusion from figure's 3 proposed model is that a SC network which employs the principals of quality management and lean philosophy can be an efficient one. Vanichchinchai and Igel (2009) noticed that total quality management emphasizes in internal participation, in minimizing errors, in reducing costs and in meeting customer expectations. While lean philosophy empowers the network with waste reduction, cost minimization and flexibility (Packowski, 2013). The proposed model is a reliable way for the SC network that can be a guide

for companies in their efforts to achieve better utilization and performance of their SC in order to develop competitive advantages.

The main contribution of this paper is the provision of an integrated e-B model including the major areas and strategic priorities towards which firms should turn their improvement efforts, in order to achieve excellent e-B performance. This framework is based both on qualitative information extracted from previous literature and quantitative evidence from an empirical survey that was conducted in the Greek region, capturing real world views and data.

The results of the study have led to the development of an integrated e-B model consisting of five CSFs: 1. Performance Measurement and Improvement, 2. Partner Orientation, 3. Customer Orientation, 4. Information Technology Resources (ITR) and 5. Human Resources (HR). This is the first model to integrate RBV with SCV and performance improvement. More specifically, the proposed model shows that Value Creation in any e-B organisation can result from the synergy between the effective management of their Resources (Resource Based View) and the effective management of their Supply Chain (Supply Chain View). It proves that an e-B organisation's RBV has a direct and positive effect on its SCV, which in effect has a direct and positive impact on its Performance/Results.

The research outcome enables managers to design their e-B strategy more systematically and effectively so as to be consistent with their competitive priorities (Swaminathan & Tayur 2003; Wu et al., 2006; Zhuang & Lederer, 2006; Soto-Acosta & Meron o-Cerdan, 2008). Strategic priorities comprise the foundation for operational planning and resource allocation activities and capture the clearness of the strategic objectives (Kim, 2013; Selldin & Olhager, 2007). Also, the proposed model highlights and makes clear to managers that the customer - supplier

relationships (internal and/or external) are essential for optimal e-B performance (Osterwalder & Pigneur, 2004). Overall, the proposed model could serve as a suitable formula for assessing the effectiveness and readiness of any e-B organization to face competition. The proposed model is an effective way to evaluate the consistency of strategic objectives and actions adopted for the e-B (Saarijärvia et al., 2012).

Practitioners can also use the findings in this study as a vehicle for improving and increasing the performance and success of e-B operations among the entrepreneurs and small and medium enterprises (Sebora, et al 2009). As for ecommerce entrepreneurs, these results will help them to have a better understanding of the current situation regarding the key success factors which can contribute to their businesses' success. In addition, this study contributes to the growing body of knowledge for both entrepreneurship and ecommerce in several ways (Sebora, et al 2009).

Summarizing the previous discussion, we argue that the proposed framework has six major advantages. Firstly, the research outcome enables managers to design their e-B strategy more systematically and effectively so as to be consistent with their competitive priorities (Kim 2013). Secondly, the proposed framework expresses the great importance that has the institutionalization of the e-B CSFs for its performance. Thirdly, the proposed framework highlights and makes clear to stakeholders that the SCV of the e-B that is customer - supplier relationships (internal and/or external) is essential for its performance. Fourthly, the proposed framework could serve as a suitable formula for assessing the effectiveness and readiness of e-B to face the competition. The findings of the assessment can be considered as indicators for the management in terms of the performance of the following strategy practices. Fifthly, the proposed framework is an effective way of prioritizing the CSFs as it provides the most important areas on which the firm can base tasks like evaluation, benchmarking, and comparison.

The framework can yield the different aspects of the SC competitiveness level and can give a direct result of the SC competitiveness. Managers can comprehend the appropriate measures and metrics to apply among and across the e-B organization. They can also make benchmarks and comparisons between priorities. Finally, the proposed framework is an effective way to evaluate the consistency of strategic objectives and actions adopted from the e-B organization (Saarijärvia et al. 2012).

Finally, this study, as most empirical studies, has a number of limitations, which can be eliminated through future research. First, this study is conducted in Greece, a country with limited use of Internet. Future research could test the proposed model in different countries with more intensive use of Internet. This could give the opportunity for comparisons between countries and eventually outline similarities and differences on e-B culture. Second, in this study data were selected from e-B companies from all sectors in Greece. Further research could test this model in specific sectors such as telecommunications or tourism (Oliveira and Martins, 2010), in order to identify possible variations in the importance and effect of the various CSFs, in different industries. Finally, the proposed five Critical Success Factors could be examined separately in order to analyze them in depth and obtain more detailed conclusions on their usefulness and importance to the successful implementation of e-B.

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