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# THE ELEMENTS FOR SUSTAINABLE E-BUSINESS MODELLING: A 3D APPROACH

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## Abstract

*The sustainability of the business is a global contemporary issue. E-business modelling is another already established term as it converts technology into economic value. Although e-business modelling and sustainability of the business are the two significant global trends now but still there is no common perception about the elements that are essential for a sustainable e-business model. Surprisingly, none of the approaches even consider sustainability as a major element while modelling e-business. Therefore, after completing extensive literature review on e-business modelling and sustainability of the business we carefully identify and determine the required elements for a sustainable e-business model in this paper. We also clarify the significance for selecting these elements. The elements are three dimensional (3D) and selected from customer value area, business value area, and process value area so that the modelling elements preserve the interests of all stakeholders while upholding the sustainability.*

*Keywords: Sustainability, E-business, Business model, Blended value.*

# 1 INTRODUCTION

The term ‘e-business modelling’ is very common these days. But wide and comprehensive models are still very informal and generic; and it is considered that only some views of e-business have been investigated. It is also believed that at this stage unambiguous and well-defined e-business models exist only for several narrow areas, but wide and comprehensive models are still very informal and generic. Nowadays, to be competitive it has become very important that all businesses carefully validate their business objectives, requirements, and strategies through a careful process of formal business modelling with the current global e-business and e-commerce initiatives. But it is not clear yet how much these existing e-business models are really useful in shaping the business as the elements of the modelling vary model to model. It is also important for effective business decision making to have clear and concise modelling that allows the extraction of critical values from business processes and specifies the course of action to be enforced accurately. Similarly, a very few business models talk about the sustainability of the businesses. Although sustainability issues are considered in some modelling approaches, they are mainly in strategic level and not in operational level. To develop a better understanding about sustainable business and to enhance the confidence in the feasibility of these ideas such a modelling framework needs to be developed that can be easily implemented by the stakeholders successfully and that will truly contribute to the innovative e-business modelling ideas. For the long run sustainability business modelling approaches only with strategic directions are not sufficient, instead, a complete sustainable e-business model with operational directions is essential. While sustaining socially and environmentally, businesses also must sustain economically. To sustain economically, socially, and environmentally, businesses must also need to make sure that they have achievable short-term and long-term strategic goals and efficient value creation processes.

According to the literature (Emerson, 2003, 2006; Emerson & Bonini, 2003) blended value, which is introduced by the scholars lately, is the integration of economic value, social value, and environmental value. Blended value which is also sometimes referred as “shared value can be defined as policies and operating practices that enhance the competitiveness of a company while simultaneously advancing the economic and social conditions in the communities in which it operates” (M. E. Porter, 2011). But these blended value definitions in the literature neither directly include the business value nor the process value. Business value is vital in the sense that it safeguards the interest of the organisation and helps to keep in track for achieving goals. Similarly, process value is another vital element as it supports to produce both customer value and business value (economic, social, and environmental). Therefore, we define blended value as the integration of economic value, social value, and environmental value for customer, business, and value process. It is different from CSR (Corporate Social Responsibility) value in the sense that CSR value is separate from profit maximization and agenda is determined by external reporting, whereas blended value is integral to profit maximization and agenda is company specific and internally generated. Moreover, this value is not only concerned with the customers’ demand or expectation but also it safeguards the interests of the business. After extensive literature review and careful consideration the proposed elements of the e-business modelling are chosen from the blended value area. In such a theoretical lacuna regarding blended value and e-business modelling the aim of this paper is to identify the required elements necessary to develop a sustainable e-business model that will encapsulate economic, environmental and social aspects in the strategic and operational settings of organizations. In this paper we identify the elements that are important in developing sustainable e-business model. We termed them as ‘blended value elements’. These blended value elements can be used to develop e-business models that will be sustainable and will safeguard the interests of all the stakeholders. The blended value elements will also help to identify and select the optimal design specifications necessary to be implemented for the sustainability of the businesses. Therefore, we, in this paper: (i) explore and determine the important elements in developing e-business model; and (ii) investigate how the sustainability dimensions can be integrated with the value dimensions when developing sustainable e-business model. The following section of the article covers extensive literature review on business modelling, e-business modelling and sustainability of the business. Section 3 explicate the importance

of the three dimensional elements in e-business modelling. The identification of three dimensional elements and their comprehensive explanation is covered in Section 4. Section 5 is consists of an analysis on findings and further research direction; and finally, Section 6 completes the article with a conclusion.

## **2 RELATED WORKS**

### **2.1 Modelling of business**

Osterwalder and Pigneur (2002) conceive the business model as “description of the value a company offers to one or several segments of customers and the architecture of the firm and its network of partners for creating, marketing and delivering this value and relationship capital, in order to generate profitable and sustainable revenues streams.” Tapscott, Ticoll and Lowy (2000) provide a typology of business models that they call b-webs. The modelling approaches by Petrovic, Kittl, & Teksten (2001) and Auer & Follack (2002) are very similar, who view a business model as a model that “describes the logic of a ‘business system’ for creating value that lies behind the actual processes”. In the methodology proposed by Afuah and Tucci (2001), one can find a list of business model components, from the scope over pricing and the revenue source to connected activities and capabilities; but it is less clear how the value is delivered to the customer. There are some more researchers who have worked on business modelling. Among them the research works of Amit and Zott(2001), Zott and Amit (2007, 2009), Zott, Amit, and Massa (2010), Hawkins (2001), Stabell and Fjeldstad (1998), Linder and Cantrell (2001), Applegate (2001, 2009b), Hamel (2000), Papakiriakopoulos, Poulymenakou, and Doukidis (2001) are worth mentioning. It is found from the literature that there are different aspects that are used by the scholars for business modelling, such as, product/revenue aspects, business actor/network aspects, and marketing specific aspects, etc. There are even different of terms that are used in business modelling. Business model has been referred to as a statement (Stewart & Zhao, 2000), a description (Applegate, 2000; Weil and Vitale, 2001), a representation (Morris et al., 2005; Shafer et al., 2005), an architecture (Dubosson-Torboay et al., 2002; Timmers, 1998), a conceptual tool or model (Osterwalder, 2004; Osterwalder et al., 2005; Teece, 2010), a structural template (Amit and Zott, 2001), a method (Afuah and Tucci, 2001), a framework (Afuah, 2004), a pattern (Brousseau and Penard, 2006), and as a set (Seelos and Mair, 2007) found by Zott et al. (2011).

Although a number of researchers tried to include value aspect in their modelling but none of them precisely point out the contents of the value that will be able to make a business sustainable. The value aspect is included mainly for economic goal purpose, for example, value proposition (Amit & Zott, 2001; Johnson, Christensen, & Kagermann, 2008; Magretta, 2002; A. Osterwalder & Pigneur, 2005; Petrovic, et al., 2001), value architecture (Timmers, 1998; Venkatraman & Henderson, 1998), value network (Amit & Zott, 2001; Bouwman, 2002; Jaap Gordijn & Hans Akkermans, 2001), value revenue (Linder & Cantrell, 2001; Rappa, 1999; Teece, 2010), etc. Interestingly, sustainability aspect is fully absent in the previous business modelling approaches.

### **2.2 Modelling of e-business**

The majority of research into business models in the information systems field has been concerned with e-business and e-commerce; and there have been some attempts to develop convenient classification schemas (Al-Debei & Avison, 2010). Table 1 shows the elements that are used for business and e-business modelling by different researchers. For example, definitions, components, and classifications into e-business models have been suggested (Afua & Tucci, 2001; Alt & Zimmerman, 2001). Timmers (1998) was the first who defined e-business model in terms of the elements and their interrelationships. He provides a taxonomy in which he classifies e-business models according to their degree of innovation and their functional integration. Applegate (2001) introduces the following six e-business models: focused distributors, portals, producers, infrastructure distributors, infrastructure portals, and infrastructure producers. Weill and Vitale (2002) suggest a subdivision into so called atomic e-business models, which are analyzed according to a number of

Authors	Element indicators
Chesbrough & Rosenbloom (2002, p. 532)	Coherent framework, Mediating construct, Technology, Economic Value.
Linder & Cantrell (2000, pp. 1–2)	Business logic, Value Capture, Revenue sources.
Timmers (1998, p. 4)	Architecture, Value Proposition, Business actors and roles, Revenue sources.
Venkatraman & Henderson (1998, pp. 33–34)	Architecture, Organization strategy, Customers, Asset configuration, Knowledge leverage.
Gordijn et al. (2000, p. 41)	Value proposition /exchange, Stakeholder network.
Petrovic et al. (2001, p. 2)	Business logic, Value proposition, Intermediate theoretical layer.
Amit & Zott (2001, p. 4)	Value proposition, Structure, Governance.
Torbay et al. (2001, p. 3)	Value proposition, Architecture, Network of partners, Relationship capital, Customer segments, Revenue.
Stahler (2002, Online, p. 6)	Abstract, Simplification of current and future business reality.
Magretta (2002, p. 4)	Value proposition, Customers, Revenue sources.
Bouwman (2002, p. 3)	Roles and relationships: company, customer, partners, Value proposition, Revenue.
Hedman & Kalling (2003, pp. 49, 52–53)	Key business components, Resources, Customers, Value proposition, Network, Architecture, Structure, Dynamic.
Campanovo & Pigneur (2003, p. 4)	Conceptual, Intermediate theoretical layer.
Leem et al. (2004, p. 78)	Strategy, Revenue, Alliances.
Shafer et al. (2005, p. 202)	Business logic, Strategy, Value proposition, Value network.
Janssen et al. (2008, p. 204)	Business logic, Value proposition, Customers; Current or future business.
Osterwalder et al. (2005, pp. 17–18)	Conceptual tool, Business logic, Value proposition, Customer segments, Architecture, Network of partners, Revenue.
Haaker et al. (2006, p. 646)	Blueprint, Network of firms, Customers, Value proposition.
Rappa (2008, Online)	Revenue sources, Position in the value chain.
Andersson et al. (2006, pp. 1–2)	Business actors and relations, Value exchange.
Kallio et al. (2006, pp. 282–283)	Value proposition: information/goods/services, Industry participants: customers/partners/ competitors/government.
Rajala & Westerlund (2007, p. 118)	Value proposition, Set of actors, Revenue.

*Table 1: Business modelling elements (adapted from Al-Debei & Avison, 2010).*

basic components. Rappa (1999) provides taxonomy of e-business models based on the value offerings and mode of generating revenues. Dubosson-Torbay et al. (2001) identify the following principal dimensions for classifying business models: user’s role, interaction pattern, nature of the offering, pricing system, level of customization, and economic control. Tapscott, Ticoll and Lowy (2000) provide a typology of business models that they call b-webs, which are classified according to their degree of value integration and their degree of control of the value creation process. The proposed business model by Gordijn and Akkermans (2001) is based on e<sup>3</sup>-value methodology, which consists of building blocks that can be used to represent an e-business idea and a modelling process to model, analyze, and evaluate such an idea. Sustainability concept is still entirely absent in the e-business modelling area.

### 2.3 Sustainability and e- business

Sustainable business means a business with “dynamic balance among three mutually inter dependent elements: (i) protection of ecosystems and natural resources; (ii) economic efficiency; and (iii) consideration of social wellbeing such as jobs, housing, education, medical care and cultural opportunities” (Bell & Morse, 2009). In other words, sustainable business maintains “a balance among economic development, environmental stewardship, and social equity” (Sikdar, 2003). Importantly, it has been evident that there is a positive correlation between environmental and social sustainability and economic return (Carter & Rogers, 2008). Even though many scholars enlightened their study on sustainability incorporating economic, social, and environmental perspective but still “most companies remain stuck in social responsibility mind-set in which societal issues are at the periphery, not the core. The solution lies in the principle of shared (blended) value, which involves

creating economic value in a way that also creates value for society by addressing its needs and challenges” (M. E. Porter, 2011). Moreover, most of the scholars mainly express the needs for blended value and a very few of them provide with only hypothetical ideas for maintaining sustainability. A comprehensive business model for sustainability with operational directions is yet to be developed.

E-business is the point where economic value creation and information technology/ICT come together (Akkermans, 2001). But ICT can have both positive and negative impacts on the society and the environment. Positive impacts can come from dematerialization and online delivery, transport and travel substitution, a host of monitoring and management applications, greater energy efficiency in production and use, and product stewardship and recycling; and negative impacts can come from energy consumption and the materials used in the production and distribution of ICT equipment, energy consumption in use directly and for cooling, short product life cycles and e-waste, and exploitative applications (Houghton, 2010). Therefore, technology is a source of environmental contamination during product manufacture, operation, and disposal (Brigden, Labunska, Santillo, & Walters, 2007; Greenpeace, 2009; WWF/Gartner, 2008). But it is believed that corporations have the knowledge, resources, and power to bring about enormous positive changes in the earth’s ecosystems”(Shrivastava, 1995). A sustainable society uses ICT for fostering a good life for all human beings of current and future generations by strengthening biological diversity, technological usability, economic wealth for all, political participation of all, and cultural wisdom (Fuchs, 2008). In consistent with the definition of environmental sustainability of IT (Elliot, 2011), sustainability of e-business can be defined as the activities within the e-business domain to minimize the negative impacts and maximize the positive impacts on the society and the environment through the design, production, application, operation, and disposal of information technology and information technology-enabled products and services.

### **3 RATIONALE OF THE THREE DIMENSIONAL ELEMENTS**

Research in business modelling is not new and has had significant impact on the way businesses are operated recently. In the past, businesses limited their view of business profitability as they were only aware of economic gain and were focused on sound financial systems to maintain that gain. Similarly, businesses were only concerned about economic value even when delivering value to the customers. Then slowly the trend for socially conscious businesses started and now to compete in the market businesses need to deliver not only the economic value but the blended value. Moreover, to satisfy the customers, only economic value is not enough. Instead of economic value in early days, customers now want to know what total value they are going to receive from the businesses. Businesses now try to “create organizations, institutions and market mechanisms capable of maximizing economic value as well as social and/or environmental value” (Emerson, 2003). Therefore, to deliver a total or complete value to the customer, value propositions of the businesses must include economic, social, and environmental value.

This research approach sincerely considered the stakeholder theory while identifying the elements of sustainable e-business modelling as there are multiple stakeholders involved in e-business modelling. Stakeholder theory holds the idea that businesses shall take decision considering the interest and impact of all stakeholders. Stakeholders are those who have interest on the firm- either benefitted from or harmed by corporation actions (Freeman, 1984). The task of management is to maintain a balance among the conflicting interests of stakeholders. If a balance cannot be ensured organizational sustainability will be questioned (Freeman, 1984). As the time passes the attention and interest of all stakeholders is converging towards sustainability of the organization in terms of economic, social and environmental factors (Wheeler, Colbert, & Freeman, 2003). A sustainable organization try to maximize economic, social, and environmental performance for a sustainable and value based stakeholder relation (Perrini & Tencati, 2006) and try to integrate sustainability in the strategy to meet stakeholder demands and to operationalize the strategies (Aragón-Correa & Sharma, 2003). Stakeholder theory also holds that in the light of changing environment, to provide adequate value to stakeholders and to manage relation with them organizations need to develop specific processes at different levels of organization (Freeman, 1984). Such type of process development shall be based on

considering the economic, social, and environmental interest of the stakeholders. Hence, it can be summed up that for the sustainability of the business stakeholder theory indicates the development of a business model that recognizes the value requirements of multiple stakeholders.

What is found from the previous research in this area is that most of the business models research in information systems (IS) field has been concerned with e-business and e-commerce (Al-Debei & Avison, 2010). A number of ideas exist about e-business models (i.e. (Applegate, 2001; Bonaccorsi, Giannangeli, & Rossi, 2006; J. Gordijn & H. Akkermans, 2001; A. Osterwalder, 2004; Rappa, 1999; Tapscott, et al., 2000; Timmers, 1998), etc.) of which most of them provide only conceptual overview and concentrate only on economic aspects of the business. None of the e-business modelling ideas exclusively considers the sustainability aspects. Similarly, there is a growing number of literature available about the sustainability of businesses (i.e. (Bell & Morse, 2009; Bieker, Dyllick, Gminder, & Hockerts, 2001; Epstein & Wisner, 2001; Labuschagne, Brent, & van Erck, 2005; Lo & Sheu, 2007; Stead & Stead, 2000; Tanzil & Beloff, 2006), etc.) which do not focus on e-business. But the intersection of these two global trends, e-business and sustainability, need to be addressed. Although recently a very few researchers talks about green IT/ICT concept (i.e. (Chen, Boudreau, & Watson, 2008; Elliot, 2007, 2009, 2011; Elliot & Binney, 2008; Ere, 2011; Hasna, 2010; L. Hilty & Hercheui, 2010; L. M. Hilty, 2008; Houghton, 2010; Melville, 2010), etc.) but none of them clearly explains how those concept will fit in an e-business model to protect the interests of the stakeholders while simultaneously maintaining the sustainability. According to the literature, the sustainable value must include values from three areas: (a) Economic value, (b) Social value, and (c) Environmental value. Importantly, businesses must also realise that to be competitive in the market this value need to be measured from three dimensions:

***Dimension 1: What value is demanded by the customers?***

To sustain, every business must find out the requirements that need to be fulfilled to minimize gap of what value the customers are receiving and what value they are expecting. Businesses need to see whether the customers are receiving the total value that they are expecting, or not. If not, the businesses must identify all the existing discrepancies and try to fulfil those discrepancy requirements to deliver the total value to the customers effectively. Generally, voice-of-the-customer (VOC) approach is used to identify these discrepancies.

***Dimension 2: What value is required by the businesses based on their strategy to reach their goals?***

Conventionally, customer requirements were the only concern for the businesses to compete successfully in the market and still now there is no doubt about the importance of customer requirements in business. But nowadays only fulfilment of customer requirements does not guarantee the long term competency and profitability for the businesses. To compete successfully every business must have their own clear goal defined in their strategy that they want to achieve in time. This dimension includes all the business requirements necessary to reach the organisational targets.

***Dimension 3: What value is required by the businesses to have efficient value processes?***

Simply producing and delivering the value is not enough to be competitive these days. Rather, value need to be produced effectively by the businesses to compete and to ensure profitability for the long run. To produce value effectively, efficient process is a must. All the inefficiencies of the value processes must be identified and corrected to produce the value effectively. This dimension of measurement includes all the requirements that are necessary to make all the processes of a business efficient.

## **4 DESCRIPTION OF THE THREE DIMENSIONAL ELEMENTS**

Based on the discussion in Section 3 if the sustainable value is measured from the above three dimensions, value requirements of a business can be categorised into 9 (nine) groups as follows:

- a) Customer value requirements for sustainability (CVR): VOC based
  1. Economic requirements (EcVR1)
  2. Social requirements (SoVR1)

3. Environmental requirements (EnVR1)
- b) Business value requirements for sustainability (BVR): Strategy based
  4. Economic requirements (EcVR2)
  5. Social requirements (SoVR2)
  6. Environmental requirements (EnVR2)
- c) Process value requirements for sustainability (PVR): Process based
  7. Economic requirements (EcVR3)
  8. Social requirements (SoVR3)
  9. Environmental requirements (EnVR3)

#### **4.1 Dimension 1: Customer Value Requirements (CVR)**

In general, voices of the customers (VOCs) are indicated by customer requirements. Since rich literature is available about VOCs, we are not explaining it further. In a number of research approaches VOCs are translated as customer requirements through evaluation and validation (Chan & Wu, 2005; Wang & Hong, 2007) (Chien & Su, 2003; Han, Chen, Ebrahimpour, & Sodhi, 2001; Hwarng & Teo, 2001). But we, more specifically, by customer requirements, mean the total value (economic, social, and environmental) that is demanded by the customer. This requirement can be any or any combination of the economic, social and environmental value.

To maximise the value delivery to the customers, it is necessary to classify the customers by their demands and then rank customer requirements according to the segments. Customers can be of different types, such as, internal customers (shareholders, managers, employees), intermediate customers (wholesale people), ultimate customers (recipient of service, purchasers, institutional purchasers), etc. (Chan & Wu, 2005). If the organisation cannot identify its customer segments and considers all customers equally important then there is a greater chance of getting misleading customer requirements. That is why when identifying customer requirements, every organisation should ask itself few general questions (Mazur, 2003):

- Which customer will help them the most in achieving their business goals?
- Are all customer equally important to them, or some are more valuable to them than others?

Commonly, there are too many customer requirements to be manageable and that is why classification of customer requirements is beneficial (Han, et al., 2001) and necessary to limit the budget of investments. There are different techniques that are available to be used for identifying customer requirements, such as, market surveys (Andronikidis, Georgiou, Gotzamani, & Kamvysi, 2009; González, Quesada, Picado, & Eckelman, 2004), focus-groups (Chan & Wu, 2005; Hwarng & Teo, 2001), in-depth qualitative interview, market research, and concept engineering (Griffin & Hauser, 1993; Schmidt, 1997), etc. According to our approach, customer requirements can be of 3 (three) types:

- a) Economic value requirements for ‘Customer Requirements’ (EcVR1);
- b) Social value requirements for ‘Customer Requirements’ (SoVR1); and
- c) Environmental value requirements ‘Customer Requirements’ (EnVR1)

##### *4.1.1 Economic value requirements for ‘Customer Requirements’ (EcVR1)*

There are number of different definitions and explanations in the past literature about the economic value of a product or service. Therefore, we are not going to define it further; rather we focus on economic value requirements for customer requirements. In our approach, this customer requirement means any of the customer’s value requirements which is somehow economically related directly or indirectly to the product or service that is to be delivered to the customer. These economic requirements are not the factors from business’s point of view which are mentioned by Porter in his classical work on Competitive Strategy (1980) and Competitive Advantage (1985), instead these economic requirements are the demands from the customer’s point of view. In other words, these requirements mean all types of economic benefits that the customers are looking for. For example, price of the product or service is directly related to the product or service economically. Quality, after-sales-service, availability or ease of access, delivery, etc. also come within this group.



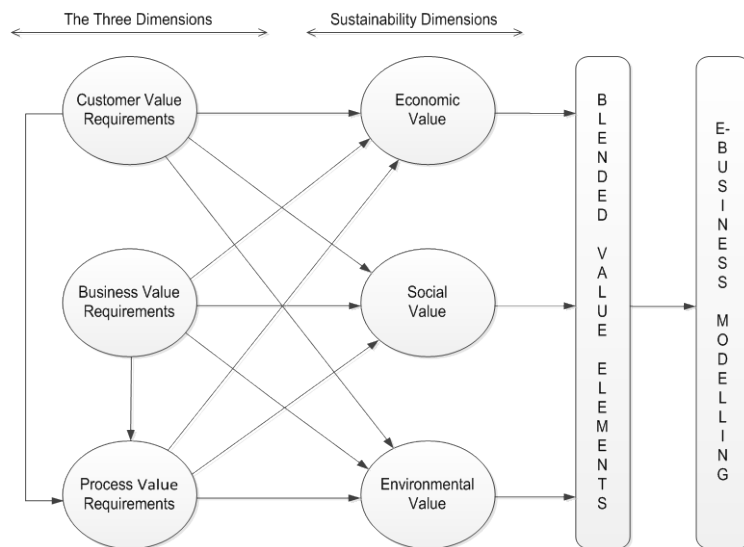


Figure 1: Proposed elements of e-business modelling

Economic value requirements, generally, are considered as the top prior requirement from the customers' point of view within all of the value requirements except some product and services whose value dimensions are different. From the previous research it has been found that majority of the customers look for economic value requirements of the product or service before any other requirements. For example, Schechter (1984) and Bishop (1984) identified customers that equate value with price. Zeithaml (1988) identified from a study that customer's equated value of the product or service with low price. Zeithaml (1988) also found that number of customers consider value as price first and quality second. According to Porter (2011), value for the customer is defined as benefits relative to costs. In another study by Hoffman (1984) reveals the salience of price in the value equations of customers.

#### 4.1.2 Social value requirements for 'Customer Requirements' (SoVR1)

Any value for the customer's society is considered as the social value requirement for the customer. Almost all of the products or services produce some sort of value impact to the society. It will be very difficult to identify many products or services which do not have any social value impact, direct or indirect. Also, there will be very few business activities which are totally detached from producing some kind of social value. If it is true that most of the businesses produce some kind of social value, positive or negative, then the social value requirements also must be encountered at the core of the business model. Today's customers are interested to see the contribution or impact of the product or service or operations of the business organisations to the society they are living. These social value requirements are not the social responsibilities that the business organisations are thinking to perform; rather these are the requirements that the customers are demanding or expecting from the products or services or from the supplier of the products or services.

There can be different dimensions of social value requirements. Such as, it can be directly related to the product or service of the business, such as, knowledge of the customers' society, customers' safety of the product, customers' health (fresh food, harmful packaging or ingredients in the food, life-saving medicines, hospitals, abusive use of drugs, use of tobacco, over consumption of alcohol), prostitution, availability of pornographic material, gambling, availability of arms, etc.; or it can be indirectly related to the business, such as, generating local employment, supporting education, health and welfare, loans and assistance to the charities, investments in the society through donations, etc. Social value requirements may also include employment policies of the organisation that ensure diversity, including gender, race and religion, proper work environment for all the staff that meets social necessities, encouraging or allowing organisation's staff to get involved in fundraising and volunteer activities for the disadvantaged within the society, offering business education, community training programs, persuading the business partners to act in a socially accountable manner, etc.

Porter (2011) identifies three ways to create economic value for the customer by creating social value—by re-conceiving products and markets, by re-defining productivity in the value chain, and by building supportive industry clusters at the company’s locations. According to him, by better connecting companies’ success with social improvement, the organisation opens up many ways to serve new needs for the customer, gain efficiency, create differentiation, and expand markets. For example, food companies that traditionally concentrated on taste and quantity to drive more and more consumption are now refocusing on the fundamental need for better nutrition (M. E. Porter, 2011). Therefore, to be competitive in the market businesses need to sincerely consider the social value requirements of the customers in modelling businesses.

#### *4.1.3 Environmental value requirements for ‘Customer Requirements’ (EnVR1)*

Currently environmental value has become a significant requirement for the customers. Customers, suppliers, and public are increasingly demanding that businesses minimize any negative impact of their products and operations on the natural environment (Klassen & Whybark, 1999). Customers now do not just look at the economic value of the product or service, they also want to know whether that product or service or the supplier of that product or service cause any impact on the environment. They also want to know, if there is any impact, then whether it is positive or negative, and to what extent; because they believe ‘business have major role to play in helping and enhancing the environment’ and thus, every business should develop sound environmental management policies for processes and products (Demirdogen, 2007). It is also believed now by the customers that there are number of ways how businesses can reduce the impact on the environment; for example, sourcing responsibly, such as, using recycled materials and sustainable timber, creating an efficient and fuel-efficient distribution network, creating recyclable products, minimising packaging, buying locally to save fuel costs, etc. As a whole, the customers want the businesses to act more responsibly by performing an important and positive role in the society through creating additional environmental value for the future generations.

Environmental value requirements include all the environmental factors related directly or indirectly, to the product or service delivered to the customer or they can be somehow related to the operations of supplier of the product or service, such as, emissions (air, water, and soil), waste, radiation, noise, vibration, energy intensity, material intensity, heat, direct intervention on nature and landscape, etc (Figge, Hahn, Schaltegger, & Wagner, 2002). The impacts on the environment may occur directly from the product or service, and/or they may occur internally within the organisation, and/or they may occur along the value chain of the businesses. Bovea and Vidal (2004) suggest how more value can be added to the product for the customer by integrating environmental impact, costs and customer evaluation during the product design process. Munoz and Sheng (1995) present a model which they believe can serve as a framework for decision-making in environmentally-conscious manufacturing. Moreover, it is noticeable now that numerous businesses have already implemented plan to minimise the impact on the environment. For example, Intel and IBM are both devising ways to help utilities harness digital intelligence in order to economize on power usage (M. E. Porter, 2011).

## **4.2 Dimension 2: Business Value Requirements (BVR)**

Better quality of the products or services lead to the fulfilment of customer requirements or higher customer satisfaction. But only fulfilment of customer requirements does not guarantee the future profitability of the businesses as the market changes. Thus, businesses need to think in advance about how to sustain the profitability in the long run. Every business must ask themselves at least two questions to sustain their profitability: (i) What do they want to achieve in the future? and, (ii) How to achieve? The answers from these two questions will help the businesses to decide about their future directions, including innovations and modifications of the processes and proper allocation of the resources. Strategic managers will be mainly responsible to identify the business requirements by evaluating the current situations and the future directions of the businesses. Managers must clearly define their goals and targets when identifying these requirements. The businesses must consider its future strategy and all the cost drivers relative to its operations when selecting these business requirements. For example, there can be a number of different business goals that businesses may aim

to achieve in the long run based on their current circumstances. It can be only increasing the profit, or increasing the sales only by keeping the profit unchanged, or increasing both sales and profit, or can be reducing the cost to increase the profit, or even can be increasing the social value or environmental value in the future for the customers subject to the availability of resources, etc. But whatever the goals are, to achieve them there are always relative business requirements that need to be fulfilled. Porter (1980, 1985) provides with a list of common cost drivers which may guide all the businesses during the business requirements selection to achieve their goals. They are: economies of scale, learning and spill over costs, coordination among different activities, pattern of capacity utilization, linkages with suppliers and channels, inter-relationships with other business units within a firm; location of the firm, etc. Business value requirements can be of different types depending on what type of business that is. All business requirements can be classified into 3 (three) groups:

- a) Economic value requirements for 'Business Requirements' (EcVR2);
- b) Social value requirements for 'Business Requirements' (SoVR2); and
- c) Environmental value requirements for 'Business Requirements' (EnVR2).

#### 4.2.1 *Economic value requirements for 'Business Requirements' (EcVR2)*

Economic value requirements for business requirements are to add some economic value to the business directly or indirectly if they are fulfilled. These economic value requirements are very similar to the requirements explained in the section EcVR1 except that those economic requirements are demanded by the customers to maximise the value and these economic requirements (EcVR2) are identified by the businesses to be fulfilled to achieve the planned future targets. For example, location of the firm, cost effective infrastructure, increase of sales and/or profit, getting cheaper raw materials, replacing the employees with more efficient machinery, reducing costs by implementing more efficient supply chain management systems, saving of time and energy, etc. add some sort of economic value to the businesses. Generally, the ultimate goal of adding economic value to business is to pass the savings to the customers in the competitive market and to maximise the profit.

#### 4.2.2 *Social value requirements for 'Business Requirements' (SoVR2)*

Social value requirements are to add some value to the society from business's point of view if they are fulfilled. Types of social values are discussed in the section SoVR1. These value requirements (SoVR2) reflect what social value the business is planning and willing to deliver to the customers' society in time outside the customers' demand. For building societal value, Nelson (1998) proposes an approach based on three elements: (i) efficient and ethical pursuit of core business activities, such as, creating local jobs, paying taxes and royalties, implementing social human resource policies, etc. (ii) social investment and philanthropy, such as, offering training program to the community, running employee volunteering schemes, business education projects, sponsoring community development trusts, civic improvement, etc. and (iii) contribution to the public policy debate, such as, supporting progress for good governance including anti-corruption initiatives and human rights standards, contribution to the social policies including education, training, local economic development, employment management, etc. These requirements eventually add value indirectly to the customers' society but instead of demanded by the customers these are selected by the businesses to achieve certain business goals. Adding social value by the businesses can be a part of different types of business goals depending on the business natures. Part of the goals can be simply for the wellbeing of the society, or can be for the competition in the market. For instance, to add some social value global firm Fortis commit to work to fight illness and disease, promote education, aid and protect children, and prevent homelessness and hunger through participation in community-based programs such as sponsorships, donations, and employee volunteer programs (Snider, Hill, & Martin, 2003). Lever Bros Ltd. uses few principles to focus on social value, such as, emphasising on employees' personal development, training, health, and safety; improving well-being of the society at large; using world class expertise base human safety to ensure consumer safety; improving living conditions of its employees, etc. (Zairi & Peters, 2002).

#### 4.2.3 *Environmental value requirements for 'Business Requirements' (EnVR2)*

According to Denton (1994), adding environmental value can be a competitive advantage for the businesses since businesses can differentiate themselves by creating products or processes that offer environmental benefits. To be competitive in the market businesses need to act environmental friendly these days. As mentioned in the section EnVR1 above, there are number of ways how businesses can minimise the impact on the environment. By implementing environmental friendly operations businesses may achieve cost reductions, too. For example, minimum use of environmentally-toxic chemicals, reduced contaminations, recycling of materials, improved waste management and reuse or recycling of waste, using fuel efficient machineries, minimize packaging, using recycled water, etc. reduce the impact on the environment and at same time they may reduce the costs of the businesses. Businesses themselves identify these environmental value requirements based on the environment they are operating and aim to achieve some goals by fulfilling these requirements. In the section EnVR1, we discussed environmental value requirements that are demanded by the customers but these environmental value requirements are identified by the businesses for their different business goals that they aim to achieve in time. For example, one of the principles of Lever Bros Ltd. is to take great care to minimize the environmental impact of all their operations- from raw material procurement, product design, manufacture and distribution- to use and disposal (Zairi & Peters, 2002).

#### **4.3 Dimension 3: Process Value Requirements (PVR)**

Every business processes value for the customer by transforming inputs (raw materials, information, money, etc.) into output to be delivered to the its customers. If the output or the processes of producing the output lack any efficiency, businesses find it difficult to sustain the profitability. Even though customer satisfaction can be obtained effectively and efficiently for some time by fulfilling various customer requirements, an organisation still cannot ensure future profitability if it lacks value creating capability (Wang & Hong, 2007). For example, the businesses may achieve higher customer satisfaction by fulfilling all the customer requirements but inappropriate allocation of the resources and inefficient processes may lead to the failure in the competition. Therefore, every business must have efficient value creating processes to be competitive in the market. Process value requirements are the requirements that need to be fulfilled to have an efficient value creating process within the existing business processes. According to Arlbjorn and Haug (2010), every business process should be defined with customer value in mind. Process value requirements are identified from the gap between what is being achieved and what need to be achieved from the existing value processes. These requirements reflect the value process inefficiencies within the existing business processes. In short, to deliver a complete value to the customer the organisation must have an efficient value process system and to have an efficient value process system all value requirements must be satisfied. These requirements are not demanded or identified by the customers rather they are identified by the business itself by looking at what amount of value it is currently producing and what amount of value it is supposed to produce to safeguard the interest of all the stakeholders. For example, inaccurate or slow manufacturing of a product or service by employee or machinery, untimed delivery, inefficient processes caused by lack of training, social misconducts, unproductive waste management, unplanned pollution (air, water, sound) management, etc. and any other inaccuracies within the existing processes which can be corrected without or with very low efforts and/or investments are identified as value requirements. Common steps for optimizing business processes which are analysing, designing, implementing and evaluating can be followed to have an efficient value creating system within the organisation.

Now, the distinction between the business value requirements and the process value requirements must not be confused. Although some elements of the process value requirements may fall under the business value requirements but all process value requirements do not fall under the category of business value requirements or all business value requirements do not fall under the category of process value requirements. For example, reduction of costs in process value requirements means the only costs which are directly related to the processing; whereas reduction of costs in business value requirements means all the costs (HRM, Financial, maintenance, etc.) necessary to run the business. Some of the social and environmental value requirements could be just the automatic output of the

existing processes which are not part of the business value requirements. Process value requirements can be any of the following 3 (three) types:

- a) Economic value requirements for 'Process Requirements' (EcVR3);
- b) Social value requirements for 'Process Requirements' (SoVR3); and
- c) Environmental value requirements for 'Process Requirements' (EnVR3).

#### *4.3.1 Economic value requirements for 'Process Requirements' (EcVR3)*

Economic value requirements for process requirements are mainly related to the cost savings within the existing business processes which are aimed to be transferred to the customers later. Again, this additional value (cost savings) is not demanded by the customers, instead the managers identify those value creating inefficiencies within the existing processes and try to correct them which result in some sort of economic benefits for the organisations. Then those economic benefits can be passed to the customers as economic value by the organisations. For example, reducing the cost of production, employing skilled workers, keeping up with the up-to-date technologies, providing adequate amount of training, using efficient energies, using efficient supply chain management systems, etc. can increase the efficiency of the value processes that can certainly add some economic value to the organisation that can be transferred to the customers, if required.

#### *4.3.2 Social value requirements for 'Process Requirements' (SoVR3)*

Present expectation by each society is that every business should act honestly and ethically. Value for the society can be of different types: basic value, ethical value, voluntary value, etc. To identify the social value requirements for value requirements managers look at the whole value process of the organisation and see whether there is any scope to add some value to the society they are operating within the existing value process systems. Sometimes the businesses even do not hesitate to spend some extra (investment) or to give some extra effort if there are chances to add some social value. In the sections SoVR1 and SoVR2, we have already explained about what the social value is and their examples. SoVR3 is different from SoVR1 and SoVR2 in the sense that SoVR1 requirements are demanded by the customers, SoVR2 requirements are identified by the managers that they are planning to deliver to the customers in the future, and SoVR3 requirements are identified by the managers but they are identified within the current value creation process so that they can be fulfilled and delivered immediately. For instance, educating disadvantaged children, organising skills training for unemployed people, employing disabled people, establishing schools and colleges, sponsoring social events, organising social gathering, organising awareness programs etc. can add value to the society; and most of these requirements can be easily fulfilled by the businesses without or with a little efforts and/or investments.

#### *4.3.3 Environmental value requirements for 'Process Requirements' (EnVR3)*

To minimize the impact of current value processes on the environment these value requirements need to be fulfilled. To fulfil these requirements the businesses try to find and implement all the necessary steps within the existing processes that will stop or reduce the chances of effecting the environment, thus, adding some value to the environment. Similar to SoVR3, these requirements are also identified within the current value process system by the managers so that they can be fulfilled and can start adding more value immediately. EnVR1 requirements are demanded by the customers but EnVR3 and EnVR2 are identified by the businesses themselves to increase the value by increasing the efficiencies in the business processes now and in the future respectively. For example, leakage of water/oil/heat, incompetent waste management, inefficient disposal and recycling of materials, unplanned pollution (air, water, sound) management, uncontrolled ecosystem stress, heating and lighting inefficiency, etc. will result in incompetency in the value processes for the businesses. Hence, businesses may get rid of these inefficiencies and add value to the value creation processes by fulfilling these environmental value requirements.

## 5 ANALYSIS AND FURTHER RESEARCH DIRECTION

What has been realised from the above discussion is that focusing only on the customers' demand is not enough to be competitive regardless of whether the demand is economic, social, or environmental. As mentioned above, customer satisfaction can be obtained effectively and efficiently for some time by fulfilling various customer requirements but still an organisation cannot ensure future profitability if it lacks value creating capability. Moreover, only fulfilment of customer requirements does not guarantee the future profitability of the businesses as the market changes. To be competitive and to maintain the sustainability an e-business must consider values (economic, social, and environmental) from all three dimensions: customer value requirements, business value requirements, and process value requirements. It is also found that each of the value elements (customer value, business value, and process value) need to be related to all of the sustainability elements (economic, social, and environmental) (see Figure 1). What has been also realised is that within the blended value elements the customer value and the business value are partially dependant on process value as the process value supports the customer value and the business value. Based on the three dimensional elements of e-business model our further research will be directed at the development of an e-business model based on blended value which will be sustainable and at the same time will safeguard the interests of all the stakeholders i.e., customer, business, society, and environment. The blended value requirements will be able to identify and select the optimal design requirements necessary to be implemented for the sustainability of the e-business. Therefore, the main objectives of the further research in this area can be: (i) To explore how the concept of blended value dimensions can be used in developing an e-business model; (ii) To develop a 'value-sustainability' framework for modelling e-business in conjunction with 'organisational value' and 'sustainability' concepts; and (iii) To explore and study how these three dimensional elements can be used to determine the optimal design requirements in developing an e-business model.

## 6 CONCLUSION

There are number of proposals and approaches about business and e-business modelling in the literature of which only a few used 'value' as one of the elements in their modelling. But 'value' in those approaches is measured mainly from the customer's point of view and not from the business point of view or the process point of view. This means 'business value requirements' and 'process value requirements' are fully ignored in the previous approaches. Lately, some scholars are talking about 'sustainable value', 'shared value, or 'blended value'; but even they did not consider 'business value' or 'process value'. Moreover, none of them clearly explicated the value elements that will look after the interests of both the customer and the business. In this paper, after extensive literature review we have shown the important elements that should be used for a sustainable e-business model. From the literature we have investigated and determined that the three dimensional elements should be used in developing sustainable e-business model. We have explored and demonstrated how the sustainability dimensions can be integrated with the value dimensions when developing sustainable e-business model. We have also clarified why these three dimensional elements should be used for sustainable e-business modelling.

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