

## A REVIEW OF ENTERPRISE SUSTAINABLE DEVELOPMENT MODELS: CRITICAL APPRAISAL

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**Abstract.** Sustainable development has become a widely used concept and an important global issue. Enterprises aiming for sustainable development must combine economic interests with environmental and social needs, while keeping economic profit as a priority. A variety of different models of sustainable business issues have already emerged. The major challenges of enterprises include choosing particular model and assessing the sustainable development performance. The purpose of this article is to analyse and critically evaluate various models of enterprise's sustainable development, identify advantages and limitations of existing models and propose procedural model suitable for manufacturing and service enterprises. The enterprises sustainable models will be analysed by covering economic, social, environmental and technological aspects of sustainability. Research will be carried out using analysis of scientific literature and synthesis of various approaches.

**Keywords:** SUSTAINABLE ENTERPRISE, SUSTAINABLE DEVELOPMENT, SUSTAINABLE BUSINESS MODEL, TECHNOLOGICAL ASPECT.

### Introduction

Climate change, overpopulation, resource depletion, environmental degradation etc. are global trends clearly signaling for a need of sustainable business. Business needs to learn to do more with less because less used resources means less impact on the environment. 30 years ago G.H.Brundland (WCED 1987) defined Sustainable Development as "a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations". Companies have always been the engines for economic development. M. Wilson (2003) claims that the contribution of sustainable development to corporate sustainability is twofold. First, it helps to set out the areas that companies should focus on. Second, it provides a common social goal for companies, governments, and civil society to work towards: environmental, social, and economic sustainability. The need of business to be sustainable is not subjected to discussion as developed countries have already progressed to a state at which critical question is how could organizations be transformed, leading to its contribution to sustainable development. As stated by S. W. Bocken et al. (2014) it is not always clear how delivering social and environmental value might translate into profit and competitive advantage for the company. In order to enable the enterprise to develop sustainability, all processes of the enterprise have to be transformed under the action of dimensions of the sustainability (Ciemleja 2010). G. Ciemleja (2010) concludes that the sustainability of the enterprise depends on its management system and all the processes supporting sustainability of the enterprise are mutually connected, interact, and functional process of each management level is being implemented through dimensions of sustainability. Schaltegger et al. (2016) propose the following definition of a business model for sustainability: a business model for sustainability helps describing, analyzing, managing, and communicating a company's sustainable value proposition to its customers, and all other stakeholders, how it creates and delivers this value, and how it captures economic value while maintaining or regenerating natural, social, and economic capital beyond its organizational boundaries.

**Research object** – models of enterprise's sustainable development.

**Research objective** – to analyse and critically evaluate various models of enterprise's sustainable development, to identify advantages and limitations of existing models and to propose procedural model suitable for manufacturing and service enterprises.

**Research methods** – a systematic analysis of scientific literature and the synthesis of various approaches.

### Literature Review related to Enterprise Sustainable Development Models

For a long time the traditional responsibility of companies has been simple – just economic survival in a free market context. As pointed out by Freeman (1984) – the only business of business is to do business (Freeman 1984). However, society has changed fundamentally. Organizations are not held responsible for delivering high quality and high-end products and services. They are expected to meet the needs of stakeholders and to ensure that negative social, environmental impact is reduced to a minimum (Jonker, Witte 2006). Business model might provide a structured way for sustainable business thinking by mapping the purpose, opportunities for value creation across the network, and considering possibilities to generate revenue in companies. It provides the conceptual logic, which connects functional activities in a business (such as finance, marketing, R&D, procurement, product design and manufacturing) to one another (Bocken et al. 2014). The following academic databases were used for the literature search: Scopus, EBSCO Publishing, Emerald Management, Taylor and Francis, Science Direct. The author evaluated whether existing models and frameworks found in the literature could be used as an idea to develop new one model.

### Models based on three aspects of sustainability

Triple Bottom Line (TBL) typology has been launched by John Elkington in 1997. The aim of the model is to support the decision-making process integrating 3P: People, Planet and Profit. People stand for social well-being and social equity, Planet for environmental quality and Profit for economic prosperity (Figure 1).

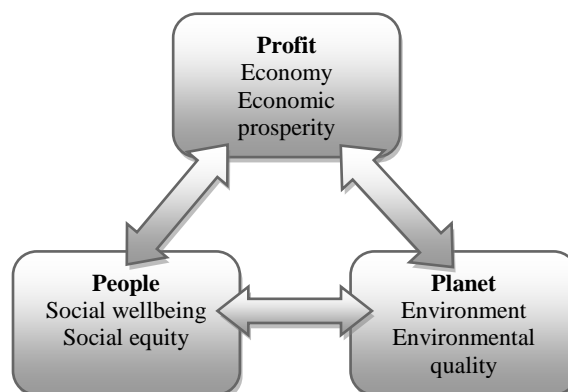


Fig. 1 Triple Bottom Line model (composed by the author according to

Elkington 1997)

Though profitability is essential for the survival of organizations, sustainable businesses take two other bottom lines into consideration: natural capital and social capital.

The TBL is an accounting framework which has changed the way businesses, non-profits and governments measure sustainability and the performance of policies. Major problem with the triple bottom line is that the three separate accounts cannot easily be added up. It is difficult to measure the planet and people accounts in the same terms as profits. T. F. Slaper, T. J. Hall (2011) identifies challenges by putting the TBL into practice. These challenges include measuring each of the three categories, finding applicable data and calculating a policy's contribution to sustainability. Making an index that is both comprehensive and meaningful as well as identifying suitable data for the variables that compose the index is another challenge. L. Dagilienė (2014) notes that despite the complexity of the calculation methodology TBL had a huge influence on the Dow Jones index development. Beyond the foundation of measuring sustainability on 3P, the flexibility of the TBL allows organizations to apply the concept in a manner suitable to their specific needs. The companies like DHL, Seventh Generation, EnviroPure Systems, The Eco-Laundry Company, Patagonia and many others are proof that triple bottom line operations *are* possible and inspiring others in the process.

J. Jonker, M. Witte (2006) presented 3H (Head, Heart, Hands) model created by F. Bergmans (2006) which is very similar to 3P. Author notes that managers respond with their intellect (head), feelings (heart) and knowledge about behavioural practices (hands). These three perspectives can be visualised as a triangle; each side has its own meaning:

- Head-Heart: Who are you? (the balance between rationality and feeling);
- Heart-Hand: How do you do it? (the mutual influence of feeling and action);
- Head-Hands: What is the impact? (the evaluation of whether it works as you want).

The integration of the 3P triangle and the 3H triangle leads to three other triangles that show in visual terms the decision-making process (Figure 2).

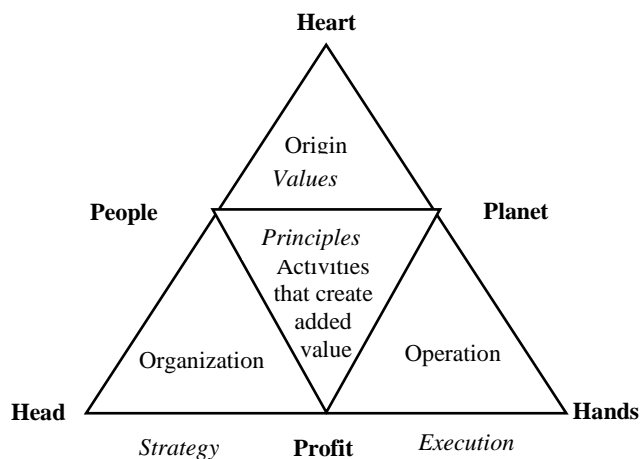


Fig. 2 Head, Heart, Hands Model (composed by the author according to Bergmans 2006)

Figure 2 shows that this new triangle also includes the following corner segments:

- Operation: What are we going to do?
- Organisation: How are we going to do it?

- Origin: Why are we going to do it?

Integrating People, Planet and Profit means bringing coherence to the threeperspectives: origin, organisation, and operation. To successfully achieve this linking process it is important to understand the driving forces behind the three perspectives. The aim of 3P model is to support the decision-making process in integrating People, Planet and Profit. By defining six driving forces in three perspectives, management and staff can focus discussion on the essence of sustainability for their company. According to G. Brazdauskaite (2010) the big challenge is to formulate a mission statement which really touches the hearts of the people involved in the company. Belonging to the company makes people feel proud and subsequently leads to shared ambitions. The mission is made alive through the devotion and commitment of the staff to their work.

#### Models based on the Deming Cycle

Occasionally companies may find it difficult to identify actions that should be taken in order to reach sustainability. The SIGMA model provides a principle based framework to organize, understand and deliver more effective sustainable development management. The four phase framework enables organizations to apply existing management approaches and systematically manage sustainability issues in an integrated way. It is important to note that organisation may enter the cycle at different points and work through the phases at different speeds according to their particular circumstances and existing systems (Guidelines 2015). The Deming cycle (Plan, Do, Check, Act) plays a major part in many standards and frameworks that can be linked to sustainable development. The SIGMA Management Model uses Deming cycle as its basis to ensure compatibility with these standards without incurring excessive duplication in any of their core elements. The SIGMA Guidelines consist of two main parts (Guidelines 2015, Jonker, Witte 2006):

- Guiding Principles – support the development of organisation specific principles and enable practitioners to understand what their organisation might look like if it was sustainable.
- Management Framework – enable a systematic approach to be taken to the development, delivery, monitoring and communication of an organisation's sustainable development strategy and performance.

Model is represented by four phases:

- Leadership and Vision - defining the vision for sustainability and ensuring leadership,
- Planning - deciding what needs to be done to improve performance,
- Delivery - improving performance,
- Monitor, Review and Report - checking that performance is improving and communicate results (see Figure 3).

This enables alignment to established management processes, systems and standards. The key difference between SIGMA and any other management systems is that SIGMA is underpinned by the guiding principles of the five capitals and accountability, which provide the basis for all sustainable activity. An organisation is required to maintain and enhance natural, human, social, manufacturing and financial capitals, as well as accountability (Brazdauskaite 2010).

The COMPASS methodology is also based on a Plan-Do-Check-Act management cycle.

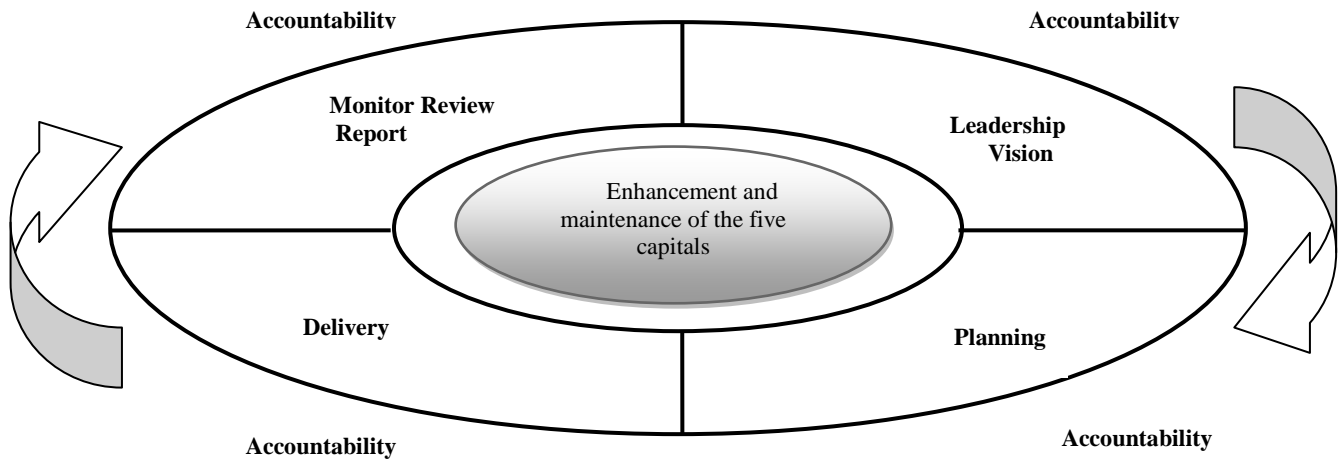


Fig. 3 The SIGMA Management Model (composed by the author according to by Knight 2006)

The COMPASS means path to Sustainability of COMPANies and Sectors. This methodology is a management system designed by M. Kuhndt and C. Liedtke in 1999 (Kuhndt, Liedtke 1999). It combines the five elements: COMPASSprofile, COMPASSvision, COMPASSanalysis, COMPASSmanagement, and COMPASSreport (figure 4). G. Brazdauskaite (2010) notes that it is a methodological framework for applying the normative concept of sustainability at the micro-level. COMPASS profile aims to describe the state of knowledge about economic, social and environmental performance issues within the organization or sector and the expectations of different stakeholders facing the organization or sector. In its vision COMPASS sees combination of available knowledge, alignment of different levels of knowledge, qualification and motivation of employees from different hierarchy levels, phrasing of visions, guidance and concrete targets. COMPASS analysis comprises the actual measurement of performance and thereby identifies particularly critical and important technical and organisational improvement areas. COMPASS management finally ensures the translation of the target set and indicators selected into decision-making processes by oviding suitable management instruments (Jonker, Witte2006). In conclusion, sustainable development relates to an unlimited time horizon and is an ongoing dynamic process. The outcomes can be used at the corporate level as internal benchmarking, product and process innovation, monitoring value creation.

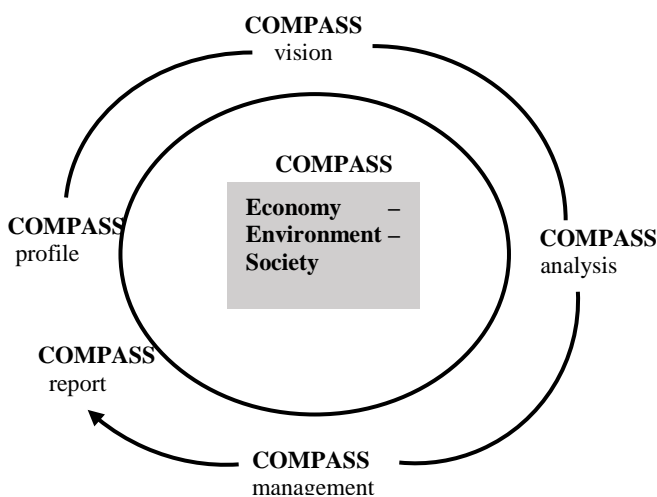


Fig. 4 The COMPASS model (composed by the author according to Kuhndt, Liedtke 1999)

**Model based on Balanced Scorecard approach**

According J. Jonker, M. Witte (2006) RainbowScore take into account all strategic aspects of the company and measuring the outcome. The company and its basic dimensions are viewed as a

rainbow. Seven colour frame is described by seven business and people aspects and present an explicit value creation structure. Model provided in Figure 5.

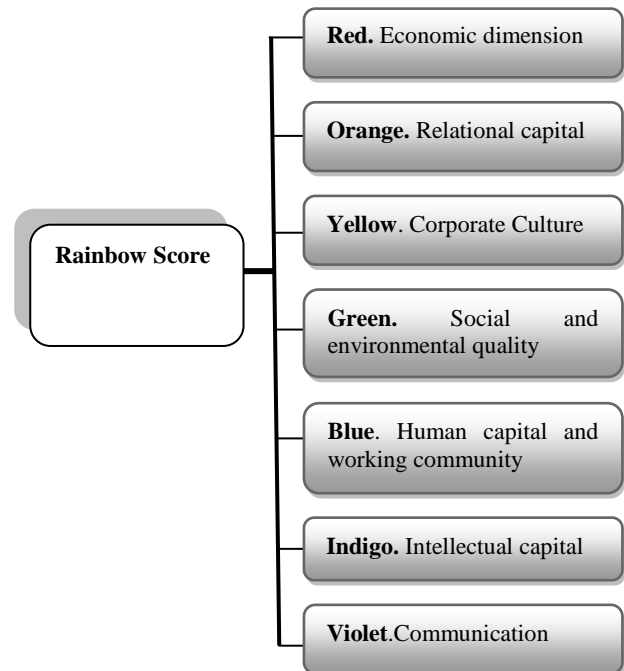


Fig. 5 RainbowScore Model (composed by the author according to J. Jonker, M. Witte 2006)

RainbowScore supports innovating and planning steps, making available figures to verify and check a path to achieving strategy. It is noted that the RainbowScore will create greater awareness and effectiveness, thus resulting in tremendous benefits for the company. However we cannot expect every aspect to be equally successful at the same time. Initially it might seem that RainbowScore complicates company's life but in reality RainbowScore helps to explain the reasons for the company's success and suggests actions to improve it. It should be noted that Balanced Score provides no explicit reference to sustainability, but focus on profitability of a company in relation to other corporate objectives.

**Integrated Models**

The Molecule Model was designed by Folkerts and Weijers in 2004. The aim is to help firms integrate the concept of sustainable development into their strategies and every day operations and provide a starting point for a company to renew its strategy and redesign its operations, and hence to find and achieve new,

distinctive business propositions (Jonker, Witte. 2006). The model consists of seven related key words that can be developed step by step. It is symbolised by a molecule consisting of seven atoms (Figure 6).

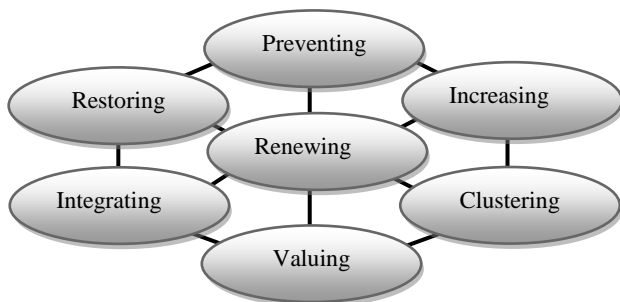


Fig. 6 The Molecule Model (composed by the author according to Folkerts, Weijers 2004)

The model gives companies a better understanding of sustainability, and helps them to define their position and develop their strategy.

The Global Compact Performance Model is a framework designed to systematically guide companies in their ongoing efforts to implement the Global Compact’s ten principles in the four areas of human rights, labour standards, the environment and anti-corruption. Model has been designed to appeal to the widest number of businesses, from large multinational Corporations to small and medium sized enterprises, wherever they are based or are operating, and regardless of their industry sector. The Global Compact Performance Model is composed of ten elements of business practice (see Figure 7), each of which is represented by a separate segment of the diagram.

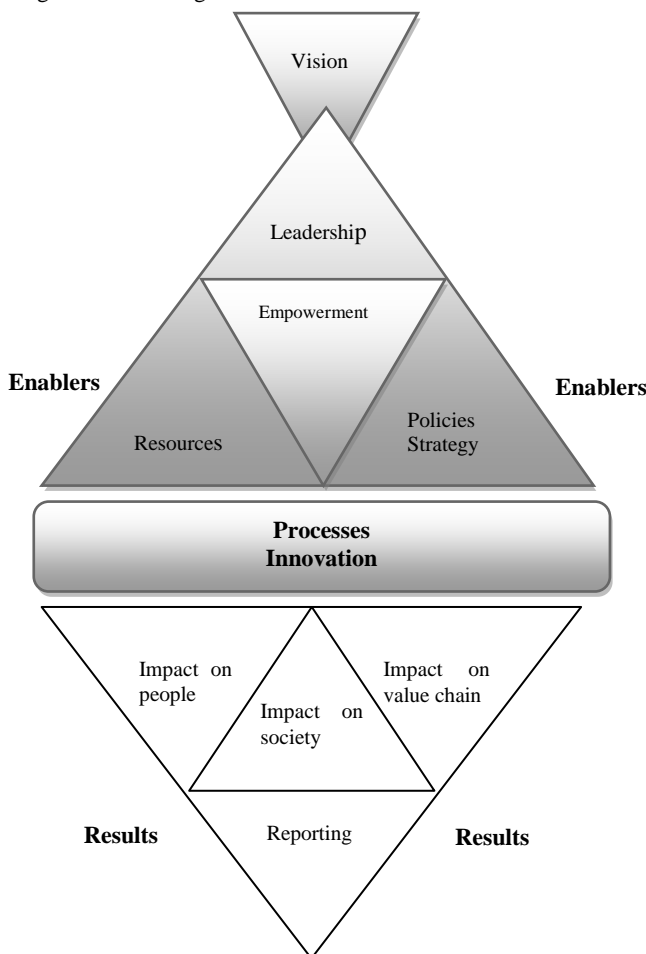


Fig. 7 The Global Compact Performance Model (composed by the author according to Fussler 2004)

Model divided into two parts - „enablers“ and „results“. „Enablers“ are the foundational elements that help create an

enthusiastic, focused, winning organisation capable of achieving its vision. Whereas „results“ – define the key outcomes sought. Companies that have signed onto the Global Compact are expected to work towards implementation of the ten principles and to communicate with their stakeholders on an annual basis regarding work progress. The accessibility and relative simplicity of the Performance Model are particularly useful for companies that do not know how to implement the principles into practice. 9269 companies participants from 166 countries are now involved in the Global Compact’s – the world’s largest corporate sustainability initiative (Global Compact Network 2017). Companies are looking for reliable, objective guidance to begin their efforts to embrace corporate sustainability. Research confirms that companies who explicitly consider sustainability topics widen their company’s view on risks and opportunities and therefore increase long-term value creation. There are a number of ways to inform the society about enterprise activities and the achieved results in the area of sustainability. One of them is the *Global Compact* – the world’s largest voluntary enterprise social responsibility initiative pursuing two major objectives:

1. To help enterprise to implement the principles of "the Global Compact" into the enterprise strategy.

2. To encourage cooperation and partnership between different sectors within or outside the country when seeking universal objectives of global development.

It should be noted that Global Compact high level principles generally refers to human rights and environmental standards. Whereas link to economic sustainability is uncertain. Wayne McPhee (2014) presented Sustainable Activity Model which is very similar to the process for using M. Porter’s value chain where the firm’s activities are evaluated within each element of the model and also looking at how the elements can work in harmony to create additional value. The model consists of sustaining activities and product- focused activities. Sustaining activities are not directly included in the product life-cycle, but they can create value directly by supporting value creation across the organization. The model recognizes that the resilience and long-term value of a firm are not just created by a collection of products but by the people, systems and ideas that form the foundation of a company.

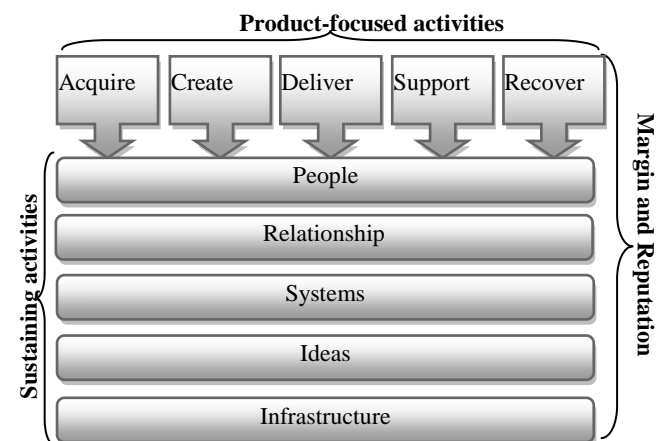


Fig. 8 Sustainable activity model (composed by the author according to Wayne McPhee 2014)

Using this model that includes all of a company’s core activities allows both practitioners and managers to identify all of the areas where there are opportunities to create value and manage risks.

**Sustainable Value Creation models**

Value creation is at the heart of any business model. An enterprise is a complex system satisfying not only the needs of consumers but also the expectations of all stakeholders. L. Michelini (2012) distinguishes two global phenomena. The first phenomenon is an evolution from the concept of Corporate Social Responsibility to the Creating Shared Value approach. The second phenomenon is the increasing role of emerging market economies in the global economy and the growing importance of the bottom of

the pyramid market segment. M. Porter, P. Kramer (2011) have highlighted the mutual dependence that exists between corporations and society, implying that both business decisions and social policies must follow the principle of creating shared value with choices benefiting both sides. M. Porter, P. Kramer (2011) suggest three aspects creating shared value:

- reconceiving products and markets;
- redefining productivity in the value chain;
- building supportive industry clusters.

Reconceiving products and markets means rethinking company's products with regard to society's needs and the benefit or harm which is inherent to them. Considering the needs of society incentive corporate innovativeness and hence leads to new opportunities for differentiation. According to L. Michellini (2012) creating shared value approach means a connection between private enterprises and the public interest that produces profitable and sustainable change for both sides. J. Schmitt (2013) notes that shared value is closely linked to sustainability issues. On the company level, shared value enhances the productivity of employees and the productivity within the value chain. On the societal level, the active internalization of social needs by business helps to better customize products and services to the needs of customers. By integrating society's needs into the value creation activities, shared value helps to improve direct working and living conditions along with company's supply chain. M. Yunus *et al.* (2015) distinguish three key characteristics of modern business: first of all, is a seek to alleviate social problems, including all forms of poverty, second of all, company should be run sustainably but it should not lose money and the third – profits are reinvested in the business rather than funneled back to shareholders. J. Schmitt (2013) claims that current sustainability approaches do not consider creating value in a way that also contributes to promoting society. P. Bilge *et al.* (2014) propose value creation framework (Figure 9).

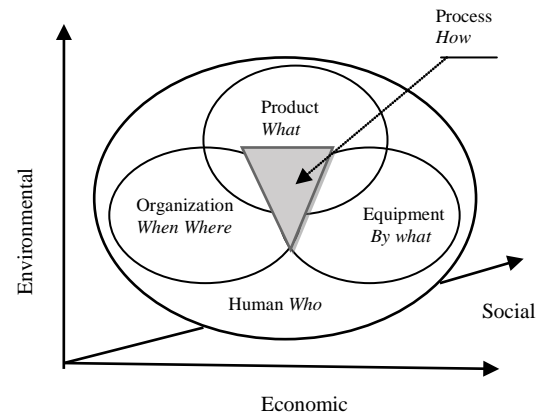


Fig. 9 Value creation model (composed by the author according to Bilge et al. 2014)

Companies create value by satisfying customer needs and shareholder requirements to deliver products or services while securing shared benefits for all stakeholders: suppliers, manufacturers, distributors and customers.

**Limitations of existing models**

Enterprises should promptly react to changes in order to remain competitive in the present globalization process. Literature review shows that in order to enable continuous growth and competitiveness of the company, implementation of sustainable development principles should be considered. However, sustainable development is not based only on economic, social and environmental aspects. Proper technology of processes is also essential for successful development of every company. Goals, employees and technologies are the basic units of an organization. People utilize technologies to reach organizational aims. Moreover, utilizing technologies that are sustainable grants more benefits for the organization, such as reduction of consumption of natural resources, increased

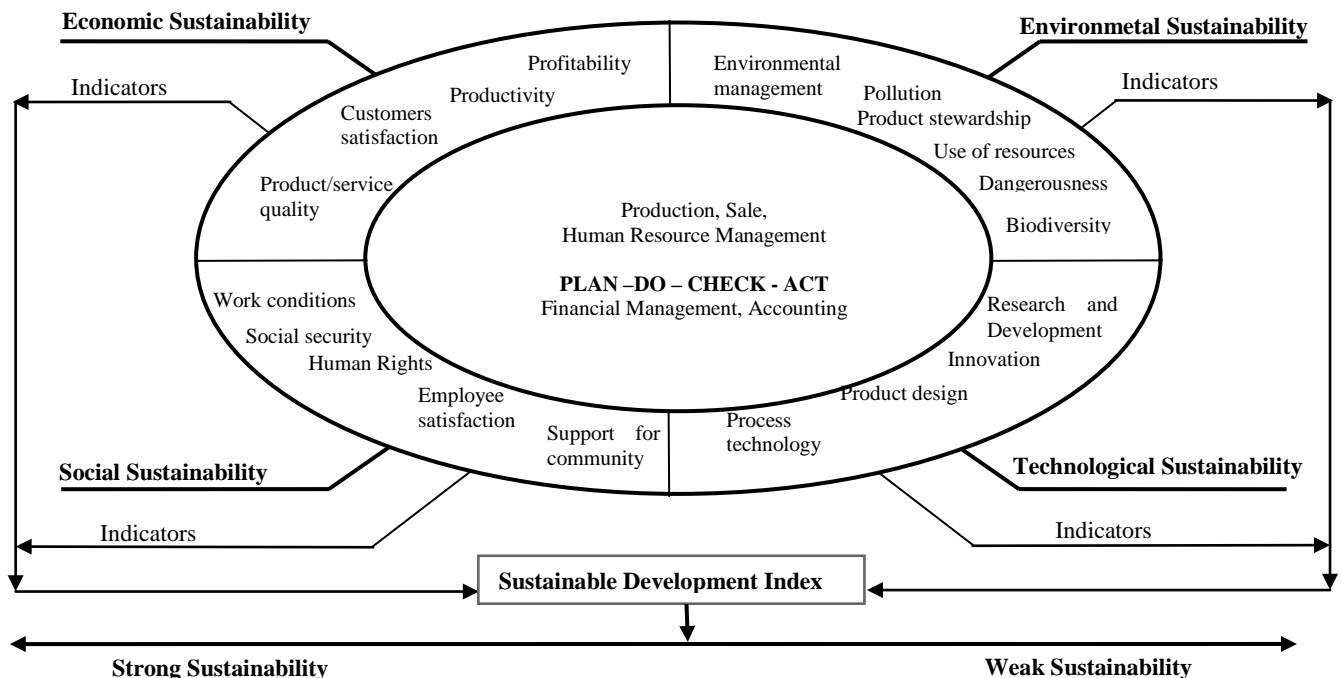


Fig. 10 Sustainable Enterprise Model (composed by author)

economical profit and competitiveness, improved quality of a product and reliability of service. Therefore, organization receives social, environmental and financial benefit. Technologies are important in both, production and provision of services as they enable development of innovations. K. Mulder *et al.* (2011) note that technological change will create social change by offering new options, social change will trigger new needs and new conditions

for technology. Z. A. Frmanzah (2015) argues that in practice, management should realize that technology adoption is not a static process. It is not only about relationship between some resources both inside and outside organization but also the ability of the organization to recognize the values of novelty in the external form then assimilate and apply it for commercial purposes. Company like Walmart has proven success in adopting technology for boosting

the company's performance based on proactive involvement of their supply chain manufacturers or vendors to end-user customers. As well as Dell's success with their logistics and supply chain technology adoption.

Sustainability is an issue that goes to the heart of the structure and conduct of business. According to P.Wells (2014) new product technologies do more than just change the character of the product itself, they enable innovative business models and new structural relationships.

R. Botsman, R. Rogers (2010) agrees that every aspect of the growing/sharing economy business models has been affected by the growing technology importance and is the most impactful feature driving the sharing economy. In conclusion research confirms technological aspect demand in the model of enterprise sustainable development.

Based on the information gathered in this research and identified limitations of current models the author propose an improved model based on four aspects of sustainability and Plan – Do – Check – Act cycle (Figure 10).

The core activity areas of enterprise are shown in the middle of the circle. This is Production, Sale, Human Resource Management, Financial Management and Accounting. Deming cycle is chosen as an effective way of demonstrating organisational activities in the enterprise. The circle demonstrates four aspects of Sustainable Development: Economic, Social, Environmental and Technological. Each chapter consist of elements of particular Sustainable Development aspect. For instant, Environmental Sustainability content consist of Environmental Management, Product Stewardship, Use of Resources, Pollution, Dangerousness, Biodiversity. In order to identify measurable indicators and assess relative weights further mathematical calculations must be performed. This would help to calculate the Index of Sustainable Development. The index shows whether strong or weak sustainability is achieved. To achieve reliability of the results a few indicators are needed. The sustainability measurements have to take into account all sustainability aspects (environmental (En), economic (E), social (S) and technological (T)). I. H. Garbie (2014) suggests the index to be calculated as a function of each sustainability aspect using the equation below:

$$S = \begin{Bmatrix} En \\ E \\ S \\ T \end{Bmatrix} = f(En, E, S, T) \quad (1)$$

where S- sustainability, En, E, S, T – aspects of sustainable development.

To estimate general Index of sustainable development equation (2) is needed:

$$I_{SD} = w_{En} (I_{En}) + w_E (I_E) + w_S (I_S) + w_T (I_T) \quad (2)$$

where  $w_{En}$ ,  $w_E$ ,  $w_S$ ,  $w_T$  – relative weight aspects of sustainable development,  $I_{En}$ ,  $I_E$ ,  $I_S$ ,  $I_T$  – indexes of each sustainable development aspects,  $I_{SD}$  – Sustainable Development Index.

### Conclusions

The way businesses operate needs to change considerably to address systemic challenges needed to deliver sustainability. Sustainable business is a holistic approach of thinking of business which seeks to integrate consideration of the three aspects of sustainability – social, environmental and economic – in a manner that balances value created for all stakeholders including the environment and society at all levels and through all activities of the business.

Literature review provides analysis of how different models work. 9 models (Triple Bottom line, Heart – Head – Hands, Sigma Management, Compass, Rainbow Score, Molecule, Global Compact

Performance, Sustainable activity, Shared value) have been analyzed.

Models were categorized into five groups (based on three aspects of sustainability, on Deming cycle, on Balanced Score, integrated and Sustainable value creation models).

According to literature review technological aspect needs to be included in sustainable business model. Since proper technology of processes is essential for successful development of every company and technological change, it will create social change and vice versa.

Composed sustainable development model provides further actions to effective implementation of the manufacturing and service companies. Calculated index value shows to interested parties whether strong or weak sustainability is achieved as it strategically important to company's growth.

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