



PRIFYSGOL CYMRU
Y Drindod Dewi Sant
UNIVERSITY OF WALES
Trinity Saint David

University of Wales Trinity Saint David
School of Engineering - Logistics and Supply
Chain Management

Module: Sustainable Logistics Operations
M5X01284

Student: Georgiana Florina Cune

The impact of technology on sustainable logistics operations

Contents

Introduction	2
The triple bottom line – the 3Ps: people, profit and planet	2
People	2
Radio frequency identification (RFID)	3
Profit.....	3
Planet	4
DHL – The StreetScooter.....	4
Conclusion.....	5
References	6

Introduction

Technology is continually developing, and it plays an important role in the supply chains. While social and environmental concerns represented the focus on the initial studies on sustainability, today companies are learning that they must maintain an equal balance between economic, social and environmental activities in order to achieve sustainable business.

Sustainability for a company refers to three main factors: people, profit and planet. According to Christopher (2011) the three Ps factors of profit, people and planet are necessarily 'intertwined'. The improvement of these factors determines the long-term success of the business.

John Elkington, the cofounder of 'SustainAbility' formulated the idea of 'triple bottom line' or TBL in 1994 and he supported that an organization is evaluating and reviewing the cost of its business only if the economic, environmental and social impacts are measured for all the integrated operations (The Economist, 2009). A representation of the 3Ps elements of profit, people and planet and its individual concerns is represented in figure 1.

The concept of the triple bottom line is that the primary responsibility of the company to all its stakeholders, including everyone directly or indirectly part of the company as well the surrounding environment it operates in.

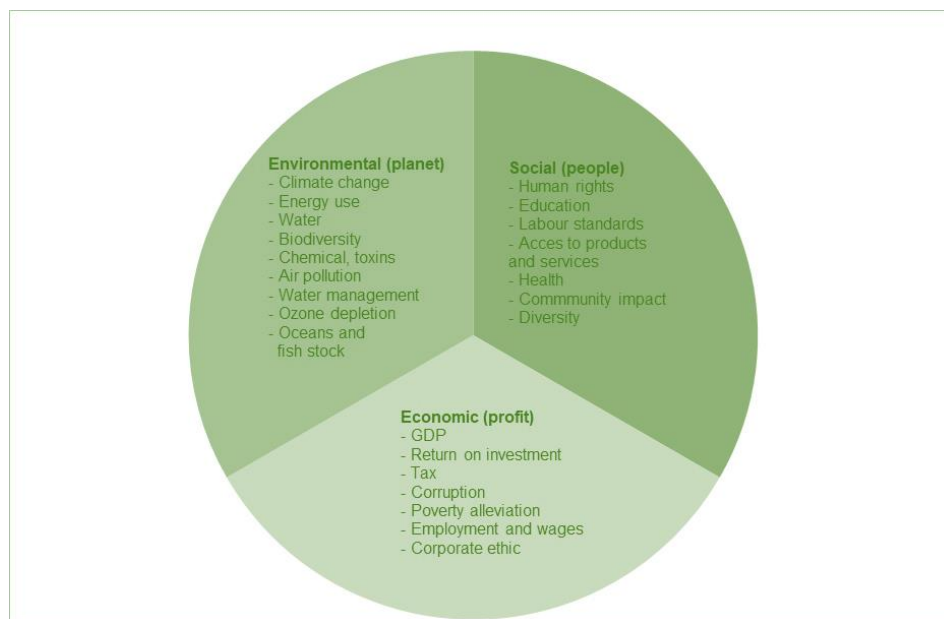


Figure 1. The 3Ps of planet, people and profit (Source in Christopher, 2011)

The integration of sustainability with the traditional supply chain operations is continuously increasing among companies due to the development of new technologies and innovations.

The triple bottom line – the 3Ps: people, profit and planet

People

Employees represent an essential asset to organizations and an important element of the supply chain sustainability.

The adoption of innovative technology leads to reduced employee cost. Of course, companies must initially invest in extensive training for their staff that will operate efficient and effective these new technologies.

A significant aspect of implementing new technologies that transform daily businesses operations of the SC management is the automating processes in logistics. Automation systems use robots to perform human activities, for example picking and stowing items in a warehouse. Often referred as 'humanoid robots', these automation systems have multiple benefits, including improved cycle times and cost and error reduction (Mangan and Lalwani, 2016).

The 'people' concept refers in fact to the human capital – the people who are employed by the company to carry out jobs, as well as the people impacted by these activities of the company.

The corporate social responsibility (CSR) approach is critical to the supply chain management and according to Manners-Bell (2017) is very challenging keeping a balance between social responsibility, economic achievements and environmental performances in order to ensure the long-term sustainability.

Radio frequency identification (RFID)

In SC management and logistics, radio frequency identification (RFID) technology is the most common method of automatic identification and data capture (AIDC) that automatically identifies and locate freight by attaching tags to almost any product and radio waves are sent out.

RFID technology enables the delivery of a batch of freight to automatically send information about the quantity delivered and the time of delivery, as opposed to manual scanning using a bar code reader that can be time consuming. Although RFID is a powerful technology that offers real time information and automatic data capture and eliminates the human operator, it is still in early stages of adoption and development and the cost of implementation and maintenance are very high (Mangan and Lalwani, 2016).

Employees are the ones who perform everyday activities and operations, therefore investing in new abilities and training will lead to higher performances and productivity. For example, companies that undertake training for their drivers obtain a high range of benefits because the drivers operate the vehicles more efficient, therefore costs are cut and profits increase (Manners-Bell, 2007).

Triple bottom line businesses perform activities that will give back to the community they operate in. The company pays fair and competitive wages to its workers and ensure safe working conditions at supplier factories, prevent abusive child labour and promote sustainable methods.

Profit

In the old times, the business company's major concern was only the profits and revenues. Today, the triple bottom line sees the profit as part of the business plan. The development of technology has helped the increasement of productivity in the supply chains, minimizing costs and errors.

The implementation of e-commerce business systems over the years has led to the elimination of paperwork and streamline payments, therefore the costs of procurement have been significantly reduced (Basu and Siems, 2004).

Nowadays adopting the latest technologies is a must for the logistics companies in order to remain competitive and increase efficiency, as well as reducing costs and maximize profits.

Planet

The main priorities of the organizations will always remain the growth of their business and profits, as well as reducing the overall costs. The success of an organization goes past the economical aspect. Sustainability is an important issue regarded by many leaders today and aims to reduce the causes of environmental problems.

The EU has elaborated a set of measures that will help with the emission decrease in the all the 28 states. The measures refer to:

- The implementation of the digital technologies to increase the efficiency of the transport system and the shift to lower emission transport modes (e.g. Marco Polo Program that ran from 2007 to 2013 and promoted the switch to greener transport modes for European freight traffic).
- Alternative energy for transport, such as hydrogen and renewable synthetic fuels, electricity and advanced biofuels.
- Low- and zero-emission vehicles such as electrically powered vehicles and trucks (European Commission, 2016)

According to McKinnon (2015) the freight transport was responsible worldwide for 10 per cent of the CO₂ emissions and the operations associated with material-handling and warehousing accounted for another 2-3 per cent of the total emissions. Mangan and Lalwani (2016) argue that the movement of freight is not entirely responsible for the environmental transportation issues and that the movement of people has also a massive impact on the environmental issues. Together, the transport industry accounts for the emissions of particles matter released from the combustion of fossil fuels.

It is important to state that the greenhouse gas emissions are not the main cause of the environmental problems and that toxic waste, water pollution, water scarcity, waste products and issues with land use are also major factors in need of consideration (Blume Global, 2019).

Route optimization is one of the best ways to reduce fuel consumption and reduce the impact of transportation on the environment. GPS devices use analytics that update routes regularly and in real-time, in this way delivery trucks avoid congestion and minimize the fossil fuel consumption.

Logistics sustainability refers to how to move and handle freight in the most efficient way and less carbon footprint on the environment. Predictive analytics technologies are used in predicting where and when shipments are going to arrive and combine shipments from multiple suppliers. Sharing the transport and distribution allows a more effective utilisation of the trucks and reduce the 'empty miles'. Multiple websites which match available capacity from carriers with seeking capacity from shippers have been developed throughout the years. These actions of sharing capacity reduce the carbon footprint of freight movements. Electric vehicles technology has already started being adopted by many carriers and logistics operators such as DHL, UPS and FedEx.

DHL – The StreetScooter

It is believed that the 'last mile' has a major impact on the environment in terms of carbon footprint and GHG emissions. In order to achieve more sustainable 'last mile' services, in 2014, DHL invested in an electric vehicle start-up called the StreetScooter that is able to deliver parcels from its distribution centres to the final recipients in the most environmental friendly way with significant emission reduction (Discover, 2018). The electric powered delivery vans help reduce the carbon emissions in the urban areas and perform the delivery

of emission-free packages on the 'last-mile'. According to Discover (2018) DHL currently uses around 7,000 StreetScooters and 3,200 electric bikes around the world.

Although electric vehicles eliminate the engine noise and reduces the gas emissions into the environment they depend on heavy batteries and have a weight limit of cargo. In Europe, around 1 per cent of the total fleet is represented by electric freight vehicles, but a bigger percentage is represented by hybrid trucks that use combined diesel with electric power. 'In order to ensure a long-term, sustainable future for global supply chains, companies must build collaborative, multi-stakeholder approaches to creating value that do not impact on the environment or have a negative impact of people's wellbeing' (Manners-Bell, 2017, p.333).

Conclusion

Advancements in technology is leading to increasing productivity in the SC, reduction of costs and less errors. The implementation of new technologies relates to the improvement of company's sustainability. The triple bottom line is one of the main principles of sustainable business operations that emphasizes not just the economic aspect of the company to make profit, but also on the social and environmental impacts of the business. These concepts look at people, profit and planet in all the business aspects. It is often common for people to regard sustainability as just from the 'green' aspects.

The 'people' concept of the triple bottom line refers to the employees of the company that perform everyday jobs for the company and customers for whom the company performs services. The social responsibility of the company refers to the fair wages to its workers, safe working conditions in the supplier's factory, prevention of abusive child labour and human rights.

The automating processes in logistics transform daily operations of the supply chain management. 'Humanoid robots' are a good representation of the automation systems. RFID are technologies that enable information to be automatically sent to the receiver without the need of manual handling of freight that can be time consuming.

Today adopting the newest technologies is a must for the logistic companies in order to remain competitive and to achieve sustainability, as well as reducing the impact of transportation on the environment. Reducing the 'empty miles' by sharing transport and distribution as well as adopting electric powered vehicles are important steps towards a long-term sustainable business.

References

1. Basu, A. and Siems, T.F., 2004. The impact of e-business technologies on supply chain operations: A macroeconomic perspective. *Federal Reserve Bank of Dallas, Research Department Working Paper*, (0404).
2. Blume Global (2019) *6 Ways Technology Reduces Environmental Impact of Supply Chains*. Available at: <https://www.blumeglobal.com/learning/environmental-impact-supply-chains/> (Accessed: 20 November 2019).
3. Christopher, M. (2011) *Logistics & Supply Chain Management*. 4th Ed. Harlow: Financial Times – Pearson Education, Ltd.
4. Discover (2018) *StreetScooter and the future electric vehicles*. Available at: <https://discover.dhl.com/business/business-ethics/future-of-electric-vehicles> (Accessed: 20 November 2019).
5. Mangan, John, and Chandra Lalwani. *Global Logistics and Supply Chain Management*. 3rd ed. 2016. Print.
6. Manners – Bell, J. (2017) *Introduction to Global Logistics*. 2nd Ed. London: Kogan Page.
7. McKinnon, A. et al. (2015) *Green Logistics*. 3rd Ed. London: Kogan Page.