

Emerging Technology and Future of Supply Chain (Procurement and Logistics Management) in Pakistan

**Mr. Sohail Ayoub¹, Mr. Muhammad Waqas², Mr. Muhammad Arshid Khan³,
Mr. Muhammad Ali Shah⁴**

¹ Working as Deputy Manager Production in Auto Parts manufacturing organization with 8 years experience. Mechanical Engineer by profession and completed MBA from IB&M UET Lahore and MS in Supply Chain Management from Bahria University Islamabad.

² Working as a Senior Executive Operations (SCM) with over 10 years experience. Operations (SCM) professional and completed MBA in Financial Management and MS in Supply Chain Management from Bahria University Islamabad.

³ Working as Head of Fixed Assets and Warehousing in Telecom Industry having 18 years experience. He has completed MBA (Finance and SCM) and MS in Supply Chain Management Bahria University Islamabad.

⁴ Senior Procurement & Operations professional with 18 years of experience in Development & FMCG organization. He has completed MBA in Marketing and MS in Supply Chain Management from Bahria University Islamabad.

ABSTRACT:

The emerging technology has revolutionaries all the business processes. The emerging technology such as AI, block chain, VR/AR, RFID uses improving the efficiency and accuracy of the different parts and activities of the supply chain management. The technology is helping the organization in reducing and optimizing the inventory level, information sharing between partners, smart contracting, traceability and visibility, pace of the processes, and more transparency to the processes. Pakistan after the development of the CPEC will be playing a hub for supply chain between China, Gulf countries and Europe. To maximize the benefits from the central hub for business activities, the government as well as private organization needs to improve their business processes by implementation of the emerging technology. Pakistan is facing problem in maturity of the technology as well as lack of skilled human resource to operate the technology at front end of the business processes. Government is investing more in encouraging the research in implementation of emerging technology in the country. The emerging technology is the only key to avail all the opportunities that will be coming from the CPEC in future.

Keywords: Emerging technology, supply chain, logistics management, procurement, Pakistan

1. INTRODUCTION

ICT is revolutionizing both product and services in modern world (Buhlis et al., 2019). Emerging technology has the capacity to change the existing market and brings more innovation into the market or even in some cases creates new markets for the business (Kajewski, 2006). As identified by Buhlis et al. (2019) the ICT is changing both services and product, the change resulting in markets from emerging technology is also not only limited to products and cover both product and services market (Myers, 2010). The emerging technology has almost brought changes in every sector such as logistics (Ye & Ma,

2017; Li & Zong,2001), health sector (Lauterbach, 2019; Pifer,2018), automotive industry (Lauterbach, 2019), agriculture (Lauterbach, 2019), sports (Petrović, Milovanović,& Desbordes,2015), service sector (Guttentag & Smith, 2017; Helkkula et al., 2015), procurement (Handfield, Jeong & Choi ,2019; Kelle & Akbulut, 2005), manufacturing (Bhattacharyya & Nair, 2019).

Our current study focuses only the application of the emerging technology in the field of the supply chain management (Procurement and Logistics Management) in the market of Pakistan. Pakistan with the development of CPEC and Gawadar port provides more opportunities for business in the region. CPEC will improve the infrastructure of the country (roads) that improve connectivity between different countries for trade and business (Abid & Ashfaq, 2015). However, this is important to discuss what different technologies and skills will Pakistan needs to have to get advantage from the opportunity of CPEC. This study will only cover the supply chain management future in terms of emerging technology in Pakistan. Before going into the detail discussion this is important to know that 7 different technologies (5G, Cryptocurrency and Blockchain, AI,RFID, mobile devices, apps and smartphones) has brought innovations in the market and expected to increase further the engagement of the customer in future (Buhalis et al., 2019). The study is divided into three parts. First part includes different emerging technology application and respective advantages in the field of the procurement and logistics. The 2nd part covers the prospective of the Pakistan.

2. SUPPLY CHAIN MANAGEMENT

There has been long debate on the different parts of the supply chain management. Londe and master (1994) defined supply chain in terms of forward flow of material from supplier to final customer. However, this definition lacks the reverse logistic and complaints of the customer to manufacturer and tier one supplier. However, we will follow Christopher (1992) definition of supply chain that includes both upstream and downstream activities.

3. EMERGING TECHNOLOGY AND PROCUREMENT

Public procurement is defined as acquisition and purchasing of the goods and services by government organization (Hommen&Rolfstam,2008). The emerging technology has changes the procurement into electronic process both for transactional procurement as well as strategic procurement (Croom, 2000). The E procurement is basically designed to automize the procurement cycle to improve the process flow of the procurement, facilitate the bidding and tendering process, reduce and optimize the spend on the procurement process and gathering more information about the product and services (Smart, 2009). Information sharing and flow is one of the important key factors in the success of the procurement (Hand field, Jeong & Choi, 2019). Technology has enabled organization to change the information sharing from paper to electronic communication such as email (Narayanan et al., 2009).For most of the organization to obtain lowest cost of production they rely on the purchasing from suitable candidate for which information is necessary to make a rational decision which is possible through hybrid technology of the AI and OLP (Lu et al., 2005).

Supply Chain Management may use the cryptocurrency which is the development of the block chain technology between supply chain partners in future (Wang, Han & Davies,2019). The block chain technology is starting to generate the smart contract which will reduce and eliminate the all cost and delay associated with traditional contracting (Gupta, 2017).

4. EMERGING TECHNOLOGY AND LOGISTICS MANAGEMENT

The basic logistic system is made of all the activities that involves in material movement from one place to another place, picking of the product and material, placing and storage of the material and information sharing (Ye & Ma, 2018). Traditional system of logistic management deals with accumulation and dispersion of the object, however the modern logistic system deals with information object (Ye & Ma, 2018). The logistic management success is also based upon the information management. Logistic information is all that information that are related to the activities of the logistic such as inventory, order picking, order delivery, transportation and warehousing (Ye & Ma, 2018). All the assets and potential resources formed around the application of the information technology is known as Logistic information system (Wade & Hulland, 2004).This

logistic IS resources are made of five different elements such as visibility and tracking, transportation and warehousing, interaction with customer, networking and process modeling and finally the data exchange between different stakeholders of the logistic system (Jeffers et al., 2008).

Visibility of the process and material builds the stakeholder confidence, and this is possible with the development of the technology such as RFID to trace the position of the material in transportation with accuracy (Ye & Ma, 2018). The RFID technology with high traceability and low labor cost (Chen, Chen, & Cox, 2012) reduces the losses occurred in inventory, improve efficiency with acceleration of the different processes and improve the accuracy of information sharing (Sarac & Absi, 2010). This system will enable the organization to accurately plan their inventory system keep the lead time and delivery time of the product. RFID has also helped the organization to easily trace the position of the items in large warehouse. The technology has valid application in the formation of data base (Bahri & Ibrahim, 2016) which can be used for making supplier data base with accurate data. The RFID technology help the logistics of retail stores of FMCG companies in reduction of the non-availability of the promotional items by passing the accurate information sharing and traceability of the items (Bottani et al., 2009). The technology is also helping the companies to get tracking of the all work in process inventory such as implemented by Ford to get the actual idea of the production (Mehrjerdi, 2012). The emerging technology has also affected the business dynamics and supply chain of the hoteling industry and tourism by using the GPS system to locate their position and other information for the customer ((Buhalis et al., 2019). The optimization of logistics system such as warehousing and material handling can be achieved through the application of the AI (Morimoto & Hashimoto, 2000). The AI system improve the order picking in warehousing for reducing the order cycle time and most efficient utilization of the resources (Manzini, Gamberi & Regattieri, 2004).

5. PROCUREMENT AND LOGISTICS IN PAKISTAN AND EMERGING TECHNOLOGY

Pakistan like all developing countries is facing problem in the implementation of the emerging technology. Majority of the business in Pakistan is SMEs and they face the problem of cost of implantation of the technology for their procurement and logistic system. The technology in Pakistan is in maturing stages. Pakistan is currently working with 4G technology that is going to update to 5G technologies in coming years. Currently Pakistan has modified some of the processes of the procurement into electronic processes to improve the visibility and transparency. The procurement regulatory authorities have established rules for bringing transparency in the procurement process. The application of the emerging technology in logistic system is not very visible in Pakistan.

The large number of retailers still follows the manual mechanism of the stock taking, shelf position identification and other activities. Some of the transportation organization has implemented the visibility and tracking of the customer order however the system is still not able to provide every second traceability. One of the big achievements of the GPS system in public transportation is done by Uber and Careem in Pakistan. Using the technology Careem and Uber has started the business almost in every big city of Pakistan. The system provides ever second visibility and has reduced the security and other issues. The government is also facing problem from the people who are not easy with technology application such as driver etc. IT improves the efficiency of the dry port and clearance at border terminal, government digitized the process by introducing the Weboc which is strongly resisted by the transportation companies and drivers as majority of them are not educated and cannot operate the technology. There is another issue also exist in the border areas of internet coverage which slows down the process and result in many hours delay.

Government is also taking interest in developing the infrastructure for the application of the emerging technology. Government has reserved a 1.1 billion Pkr for the research in artificial technology. To excel in the business of the supply chain management the companies in Pakistan must work seriously in implementation of the technologies such as RFID, AI, VR/AR, and other applications. To achieve more advantages from the CPEC, the government sector as well private sector work together to implement these technologies to get more efficiency, pace, accuracy, cost saving and more business opportunity.

6. CONCLUSION

Emerging technology is the future need of all type of business. Since supply chain management is the core of all business process will also affect from the development and more maturity of the technology. The technology application has equal importance of all the activities of the procurement and logistics management. The emerging technology such as AI, VR/AR and RFID increases the accuracy of the information sharing and accelerate the process of the procurement will result in more cost saving. The technology such as block chain will improve the contracting process of the procurement and more cost saving and timing will be achieved. The RFID, AI etc. improve the traceability in transportation and warehousing enabling the companies to accurately and efficiently their inventory management. The Technology such as OLP and AI will improve the order picking and placement in stores to reduce the cycle time of the order fulfillment. Pakistan, a developing country, is facing many challenges in implementation of the technology in procurement and logistics management. The technology is improving, and government is taking initiative to support the development of the technology. However, this is important to realize that companies dealing in supply chain management should also invest in their work force to use the technology.

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