

A Study on the Significance of Information Communication Tools with Focus on the Retail Industry

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Abstract: *Innovations and developments in information and communication technology (ICT) lead to significant and continuous changes in the retail industry. ICT has become crucial for the operations of retail companies and substantially influences their success. Retailers have to be aware of technological developments and have to manage related challenges and opportunities in order to stay competitive in the digitized retail market (Sorescu et al., 2011, p. 3). Basically, ICT includes every technology that deals with the acquisition, processing, transformation and distribution of information (Argandoña, 2003, p. 4). Some of the most important ICTs in the retail industry are: the Internet, e-commerce (electronic commerce) (Jahanshahi et al., 2013, p. 849), electronic payment (Sumanjeet, 2009, p. 18), data mining (Bagga and Singh, 2012, p. 19), radio-frequency identification (RFID) systems (Jones et al., 2005, p. 396), electronic point of sale (EPOS) systems (Lynch, 1990, p. 159), social media (Drury, 2008, p. 274), smartphones and mobile apps (Kang et al., 2015, p. 210), the Internet of Things (IoT) (Gubbi et al., 2013, p. 1645) and augmented reality (Martinez et al., 2014, p. 27). These technologies substantially influence the business models, processes, strategies and operations of retail companies (Sorescu et al., 2011, p. 3).. This examines the interactions between ICT and globalization and the consequences of the globalization process for the retail industry. ICT substantially influences the globalization process. Technological innovations, such as the Internet, represent major drivers of globalization, as they accelerate global developments. Other drivers of globalization are also supported by ICT (Aggarwal, 1999, p. 84). These drivers include, for instance, multinational enterprises (Rugman and Verbeke, 2004, p. 3), multinational trade and production (Garrett, 2000, p. 942), international finance and foreign direct investment (Cho, 2003, p. 99). On the other hand, globalization also acts as a driver of technological developments by providing a favourable environment (e.g. rising international cooperation and interactions and telecommunication and technology infrastructure expansion) and by enhancing the diffusion of innovations in ICT. Therefore, the relationship between globalization and ICT can be described as mutually reinforcing (Aggarwal, 1999, p. 85). Through its influence on globalization, ICT also indirectly influences the retail industry. Besides, globalization trends, such as the liberalization of trade policies (Bishop et al., 2011, pp. 120–121), global sourcing (Howlett, 2005, p. 25), urbanization and megacities (Kraas, 2007, pp. 80–81), natural resource scarcity (Curtis, 2009, p. III 427) and global climate change (Bu et al., 2016, pp. 577–578) have important implications for the business environment of retailers. The increase of global supply chains and production networks and the fragmentation of production processes, for instance, are consequences of the globalization process, which is reinforced by ICT (Aydın and Savrul, 2014, p. 1267).*

Keywords: Information and communication technologies, Retailing, Services and Products, Retailing Strategies

I. INTRODUCTION

Information and communication technology (ICT) has become vital for the survival and success of business companies. Developments in ICT have dramatically accelerated innovations and have changed entire industries. The most popular

example is the Internet, which has revolutionized business practices and the entire modern world. Hence, companies are constantly pressured to keep up with the latest developments in the field of ICT (Jetter et al., 2009, p. 37). As this topic is too broad to explore every aspect of it in detail, this Master's Thesis focuses exclusively on the importance of ICT in the retail industry. Moreover, this work deals solely with the users of ICT (retail companies and customers) and not with the producers of ICT. ICT is also closely linked to a phenomenon called globalization. Technology is a catalyst for globalization, as technologies, such as the Internet, facilitate global networks, trade, information and knowledge sharing and communication and remove geographical boundaries (Pohjola, 2002, p. 138). At the same time, globalization is a driver of developments in the field of ICT, as the globalization process involves the increase of flows of information, ideas and knowledge, lower communication costs and the expansion of technology infrastructures (Argandoña, 2003, pp. 9-10; Aydın and Savrul, 2014, pp. 1268-1275). Thus, there are significant interdependencies between ICT and globalization. Furthermore, the globalization process substantially influences the retail industry, as it leads to reduced barriers to trade and to the internationalization of the economy. In addition, globalization trends, such as urbanization (Kraas, 2007, pp. 80–81), can have important consequences for the retail industry. It can also be stated that ICT indirectly influences the retail industry through its influence on globalization (Aydın and Savrul, 2014, p. 1267). Hence, this Master's Thesis also examines the complex interactions and relationships between ICT, globalization and the retail industry.

II. INFORMATION AND COMMUNICATION TECHNOLOGY

Information and communication technology can be defined as technology that enables the acquisition, processing, transformation and distribution of information (Argandoña, 2003, p. 4; Jetter et al., 2009, p. 38). ICT has an essential impact on how people communicate, work and spend their (free) time. Furthermore, ICT investments have the potential to significantly influence the structure and growth of emerging and industrialized economies (Jorgenson and Vu, 2016, p. 381). Advances in ICT, such as the Internet and the availability of cheap mobile data storage, have revolutionized entire industries (e.g. telecommunications, photography, retail and media) and have also accelerated the pace of innovation essentially (Jetter et al., 2009, p. 37). Knowledge is one of the main requirements for the development and growth of companies, individuals, regions and countries (Grzanka, 2012, p. 14). Moreover, knowledge, ideas and information are indispensable resources for any decision. ICT is so important in the modern world, as it helps to manage these resources effectively and efficiently (Argandoña, 2003, p. 7). Information and communication technologies that are used in the retail industry include data mining (Bagga and Singh, 2012), the Internet, e-commerce (Notomi et al., 2015), electronic payment (Sumanjeet, 2009), smartphones, mobile apps (Kang et al., 2015), electronic point of sale (EPOS) (Lynch, 1990), radio-frequency identification (RFID) tags (Jones et al., 2005), selfservice checkouts (Lee and Yang, 2013), social media (Drury, 2008), the Internet of Things (IoT) (Gubbi et al., 2013) and augmented reality (Martínez et al., 2014).

2.1 The Role Of ICT in Retail Industry

ICT has an essential impact on business worldwide, as technologies, such as the Internet, email and e-commerce, change how communication and interactions take place (Bang and Markeset, 2012, p. 236). Advances in ICT also lead to changes in consumption and work decisions, new management systems, new labor skills, new support infrastructures and new competitive models (Argandoña, 2003, p. 5). The areas of networking, resource planning, communication and marketing are especially influenced by ICT (Tarutė and Gatautis, 2014, p. 1224). Moreover, information and communication technology has dramatically increased the importance of services in the process of value creation. ICT is the key driver of innovations and developments in the service sector and offers numerous opportunities to enhance productivity. Traditional tangible services are replaced by new intangible services (e.g. online services). Furthermore, information and communication technologies enable companies to individualize their products through adjustable production processes and they facilitate communication and interaction with customers through technologies, such as cooperation platforms and e-commerce (Jetter et al., 2009, pp. 37-39; Yapar et al., 2015, p. 642). Due to developments in ICT (e.g. networks, mobile devices and the Internet), important elements of the retail industry, such as the value chain of production, sales and distribution, are changing substantially (Notomi et al., 2015, p. 38). Hence, retail companies are revising their business strategies and are increasing the use of ICT in their operations. Innovations in the

retail industry mostly deal with the improvement of customer service, cost reduction and the enhancement of productivity (Chan and Al-Hawamdeh, 2002, p. 278). In order to improve customer service, retail companies are enhancing communication throughout the supply chain by using the connectivity of the Internet and related technologies (Barnes et al., 2004, p. 607). ICT systems and strategies, such as sales-based ordering (SBO) and efficient consumer response (ECR), can reduce costs and increase productivity by supporting and enhancing the operations of companies (Reynolds, 2000, p. 419). Moreover, even smaller companies are able to benefit from the opportunities and advantages that ICT offers, as the costs of computing equipment have decreased and the utilization of the Internet has increased substantially (Jones et al., 2003, p. 1). According to the Miniwatts Marketing Group (2017), there are 3.89 billion Internet users (30.06.2017). This means that 51.7 % of the world population (2017 estimation: 7.52 billion) use the Internet. Whereas the Internet penetration rate in Europe is 80.2 % (30.06.2017) and most Internet users are from Asia (1.94 billion). From 2000 to 2017 the total number of world Internet users has grown by 976.4 % (Miniwatts Marketing Group, 2017). These figures indicate that the Internet is of great importance for the business strategies of retailers.

2.2 Implications For Managers of Retail Companies

New technologies are influencing how retail customers choose services and products, select channels and make purchases (Grewal et al., 2017, p. 5). Due to these continuous and rapid developments in the field of ICT, managers have to be flexible and prepared to modify business processes and strategies. It is essential for the competitiveness of retail companies to identify important trends and developments in ICT early and to react and adapt accordingly (Jetter et al., 2009, pp. 43-44). Retailers that fail to keep track of technological innovations and their potential consequences for retailing risk losing customers to competitors that use ICT (especially interactive technologies) to enhance the customer's shopping experience and to satisfy their needs. Thus, it is advisable for the management of a retail company to assign one person or even department with the responsibility to monitor and evaluate new information technologies and their effect on the competitive strategies of retailers and other companies (e.g. service providers and suppliers) (Varadarajan et al., 2010, p. 108). The consulting company Deloitte (2016, p. 20) states that it is crucial for the long-term success of retail companies to have both a strong digital and physical presence. In order to succeed in the retail industry that is dominated by omnichannel retailers, retail companies also need to invest in new digital capabilities, such as analyzing collected customer data to individualize services and marketing. Managers should aim to increase the overall efficiency of the company's operations when investing into ICT. However, retailers are not able to invest in everything at the same time. Investments should be undertaken according to a chosen strategy. Retail companies should analyse their current capabilities and should detect weaknesses and problems in their organization that need to be resolved. In addition, the role of traditional physical retail stores has changed and retailers have to react to this development. The customer experience in physical stores needs to change. Technology-driven developments, such as self-service technologies and "order online, pick up in store", have the potential to significantly alter the physical shopping experience. Thus, it is important for managers of retail companies to monitor such developments and to modify their physical stores accordingly (Bain & Company, 2018, p. 4).

III. CONCLUSION

To conclude, ICTs, such as e-commerce, social media, RFID systems and data mining, have revolutionized the retail industry. The business models, supply chains, logistics and marketing strategies of retailers and other fundamental elements of retailing have changed substantially due to developments in ICT. Thus, the volatility, complexity, transparency and competition in the retail industry are increasing. Retailers face important opportunities with regard to ICT and also have to deal with its challenges. The success and survival of retail companies significantly depend on their ability to detect, understand and exploit innovative technologies that can have an essential impact on retailing. Besides, the results of this thesis show that e-commerce is the most disruptive and important technological development in the retail industry and that it is crucial for the competitiveness of retailers.

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