

Some aspects of digital transformation in postal sector

Mladenka Blagojević¹, Dejan Marković¹, Dragan Pejović²

¹University of Belgrade – Faculty of Transport and Traffic Engineering, Vojvode Stepe 305, 11000 Belgrade, Republic of Serbia

²Regulatory Agency for Electronic Communications and Postal Services, Palmoticeva 2, 11103 Belgrade, Republic of Serbia

Abstract

The fast growth in the use of technology in every sphere of people's private and business life is an evidence of the digital acceleration process. This process affected also all companies and sectors. Today, electronic communications affect all business of postal operators. Postal operators are an integral part of the overall e-commerce experience, as the delivery services are a critical element of the e-commerce customer experience. Operators offer a wide range of services to meet the needs of all customers, embracing online and mobile technologies to provide competitive and convenient postal services. It is all part of the operator's digital transformation process. The process of digital transformation of postal operators is a broad topic and in this paper only a part of possible aspects of consideration is given. Some of the challenges and opportunities related to digitalization of postal operators are presented. Also, the Integrated Index for Postal Development has been singled out, as well as the issue of sustainability of last mile delivery in conditions of digital transformation.

Keywords: Digitalization, Postal sector, Postal operator, Index of postal development, COVID-19

1 Introduction

Digitalization has impacted the development of postal markets across the world. Digital transformation of companies and correspondence is having an impact on the core business activity of postal operators. In that sense, digitalization has changed the role of the postal sector as letter volumes decline and parcel volumes grow. Whereas letter volume decline has shaped the postal market and continues to drive changes, the advances in information and communications technologies create new opportunities and demands for the postal market. The combination of letter volume decline and growth in parcel volumes has important operational and economic implications for postal networks. In response, postal operators have diversified into a broad range of new service areas. Hence, the digital transformation has become a strategic priority for postal operators.

Postal services are at a turning point: they need to adapt in order to remain relevant, competing with digitally native companies in different areas of their product portfolio. To be able to compete effectively, postal operators need to speed up the digitization of their products. This means that postal operators have not yet fully digitized, need to do so urgently or

risk being excluded as digital service providers for e-government, e-commerce, and e-finance services.

Although digitization is not a new phenomenon, the challenges and opportunities that are associated are constantly changing. Before the emergence of COVID-19, the challenges posed to digital transformation were essentially focused on the fourth industrial revolution, associated with the concepts of Industry 4.0, Internet of Things (IoT) and Web 4.0, as discussed in [1] and [2]. The challenges involved both the disruption of concepts and technologies, as well as the speed of this digital transformation. In the era of COVID-19, the challenges were exposed and it is fundamental to involve the entire organization and stakeholders in this process.

Furthermore, the pace with which this change occurred was tremendous. Organizations had to do this regardless of their previous positioning and experience in digital transformation processes. Inevitably, organizations are moving along the path of digital transformation. However, a key question is whether they are prepared for this change. Studies [3] and [4] indicate that companies, even those that are most

advanced in the digital transformation of their activities and workflows, are not yet fully prepared to face the challenges of the digital transformation. Digitization requires a restructuring of processes, turning the company more agile, investing in more organic structures, reinforcing standardization and automation in order to optimize the response capacity to customers.

COVID-19 has brought difficult and uncertain times and accelerated the inevitable processes of digital transformation. At this stage it is important to start thinking about the post COVID-19 world and, above all, to explore how we can leverage and transform these challenges into new opportunities, both in business and internal organization.

Challenges and perspectives of postal operator’s digital transformation are main objectives in this paper. The paper gives a partial overview of possible directions of digital transformation, with an overview of the current index of postal development by regions and countries. In this process of transformation, postal operators must keep in mind sustainability of last mile delivery and this is also discussed in this paper.

2 Phases in the process of digitalization of postal sector

Electronic substitution of traditional postal services is accelerating as both costumers and businesses adopt electronic processes across multiple domains. Now customers are attracted to greater convenience, faster service and lower cost [5]. In the conditions of digital economy postal services need to modernize their role to accommodate for the digital age. Postal operators should offer new products and services that reflect the evolving mandate to bind the nation together in a new world where people are increasingly communicating digitally.

In the conditions of digital economy, it is important to understand how the sector has evolved historically. There are four main phases in the process of digitalization of postal sector, as we can see in [6]. In early 90’s the efforts of postal operators were mainly focused on rationalizing and automating sorting centers. This is the first phase. The second phase was the phase of creation of new revenue-generating digital services. Most postal operators started to

offer trust-based services like certified electronic communications, online identity verification, secure electronic mailboxes, online payment, government services platforms, etc. In the third phase, the broadband penetration of Internet and information and communication technologies is increased (early 2000s) and changed the core postal business. The objective of postal operators was to expand customer access to postal services and to create new services at the intersection of physical and digital. Some of the so called core-enhancing digital postal services are support to e-commerce, e-finance and payment solutions and other support services. The last phase is the phase of digital transformation. Digital transformation is not about any particular function. It is a fundamental organizational change that comes from advances in technology, process, culture and business model. It is about converting an organization wholesale into an information enterprise where connectivity, cloud and analytics can enable faster innovation and more informed decision-making.

The drivers of digital transformation in postal sector are summarized at Figure 1. Some of them, such as broadband Internet, mobile and social networks are long-term trends that started at the turn of the century. Others, such as the Internet of Things or Big Data embody a new phase that will increasingly impact postal strategies in the coming years [7].

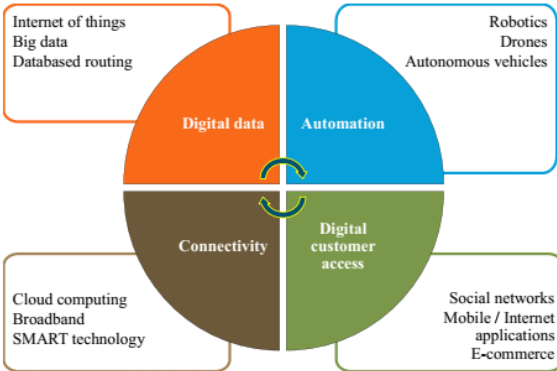


Fig. 1. Drivers of digital transformation in postal sector, Source: [6]

2.1 Transformation from physical to digital with important trust

It is a fact that the postal industry is being disrupted by technological developments. Digital means of communication are replacing paper-

based ones and decreasing the demand for physical letters. In other words, this is a call to action to increase the pace of digital transformation within the postal and express industry. The postal infrastructure forms the backbone of a government's communications with its citizens. In some EU countries, governments themselves have driven the development in a digital direction, pushing new digital services which enable them to communicate in a secure and trusted way with their own citizens. But there are many countries waiting to take the next digital steps, such as digital mail.

Amongst the different factors influencing usage, trust in government is increasingly important. An advancing digital economy and society impact the routines of people and this can only work if people trust the organization that is accountable for that change. One possible explanation is that citizens might only be willing to share personal data online when they trust their government to provide high quality and therefore secure online service.

There is still a lot of ground to be won, even amongst the frontrunners in e-government. According to the EU's eGovernment Benchmark Report 2019, the way forward in e-government services is building digital public services that people trust and will therefore use as it makes their interaction with government easier, as discussed in [6].

With emerging technologies and business models, even the biggest, most established enterprises are trying their best to modernise to keep up with the times. Such is the case with the postal industry. To survive, it has to adapt. Modernising the postal service industry is the first step in embracing digital transformation. The associated benefits include increased profits and the possibility to save on labor costs, while positively influencing the climate by cutting down on usage of paper and gas.

2.2 The some examples of postal digitalization

Secure, flexible, and inexpensive communication between citizens and public authorities, e.g. through a digital postbox of smart post offices, are some of the many advantages of increased digital communication.

These are just some of the examples of the power of digitalization.

Digital postbox services are a secure delivery channel where consumers can view, manage and organize their digital communications from multiple providers in a single location, through a single login. Through this channel, consumers can receive and respond to various transactional communications, while also securely manage other business relationships, such as paying bills, uploading and storing documents, and receiving important notices and reminders [8].

A secure digital postbox is much safer than sending physical communications via the ordinary postal system – because it is much easier to steal information from a physical postbox. Among other benefits of having a digital postbox is savings on internal and postage costs while simultaneously reducing your environmental impact.

In some geographical regions, it may be difficult to find the exact mailing address of an intended recipient, or many intended recipients may live at the same address. However, with safe digital post, the sender has a guarantee that each of the documents sent will be received by the right person.

In an increasingly connected world people want to improve control and efficiency. A smart post office puts together all the best bits about a physical location and the productivity of digital technology. They utilizes physical and digital features. Puts together multiple channels such as payment, public transport, networking into one platform for ease of use and prioritizes a personalised experience for the costumer. These smart post offices use real-time and location-based information to update the customer, offers 24/7 digital solutions, employ a digital postbox that creates an encrypted and secure digital mail ecosystem that eradicates spam and unwanted messages, evidently in [9].

Post offices are not completely abandoning old systems in place. Some of them are favoring a hybrid approach as a way to become a “smarter” post office. In this scheme, citizens can still opt to receive posts in the mail but the majority of them have converted to receiving important and sensitive documents such as letters from the bank using a more secure digital postbox.

3 Integrated Index for Postal Development

In 2020, the pandemic's impact on the world economy, global trade and cross-border supply chains was inevitable. Since the pandemic was declared, postal operators around the world have had to deal with intermittent air traffic, labour supply shortages and increased operational costs, as concluded in [10]. Unlike many other businesses, they have also had to continue operating during most lockdowns, providing services deemed essential by authorities while at the same time attempting to meet a surging demand for the delivery of online shopping transactions.

However, despite its essential nature, the sector had already been facing tremendous challenges before the pandemic. Postal operators were struggling to make their revenues grow at the same rate as the wider real economy, while postal services in many developing countries were increasingly falling behind when compared to the performance in wealthier nations. In this context, measuring postal development remains paramount and the Universal Postal Union's Integrated Index for Postal Development (2IPD) constitutes a key tool to help policymakers, regulators and operators steer the course of the sector in an environment of accelerated transformation [10].

One major symptom of the COVID-19 crisis is perceptible in the area of delivery times, which reflect the reliability of postal services. When the pandemic first struck in 2020, both speed and predictability dropped dramatically, with 13% lengthier delivery times on average and a 9% increase in the coefficient of variation of the same with respect to 2019.

In 2021, delivery times appear to have reverted to pre-crisis levels; but more time will be needed before declaring a "return to normal". Moreover, even if the deterioration of reliability through the crisis is eventually overcome, the issue of gaps in postal development is likely to remain high on the agenda of policymakers, regulators and operators in the years to come.

The 2IPD is a comparative indicator of postal development around the world. It is a composite index that summarizes information about the performance of postal operators in 168 countries. As such, the 2IPD is a unique tool for analyzing the state of the postal sector [10].

The 2IPD is built on four pillars (which are in turn sustained by a variety of sub-indicators), stated in [10]:

- Reliability reflects performance in terms of speed and predictability of delivery, across all the key segments of physical postal services (letter post, parcel post and express);
- Reach synthesizes global connectivity by evaluating the breadth and depth of the postal operators' international network. These are measured by the number of partner networks and the volumes of international exchanges, respectively, across all the key segments of physical postal services;
- Relevance measures the intensity of demand for the full portfolio of postal services relative to the best performers in each category of postal activity, also taking into account elements such as the number of international transactions and the number of post offices;
- Resilience indicates the level of diversification of revenue streams, as well as the capacity to innovate and deliver inclusive postal services.

The input is then integrated into an algorithm, which yields a general score between 0 and 100 for each assessed country. Given the statistical distribution of the 2IPD scores, it is possible to categorize countries in four main categories, according to [10]:

- Postal champions: A score above 55 shows that a country's postal development is among the top 20% in the world, a performance which can be considered very good to outstanding. This group of countries can be denoted as having a well-balanced performance across all pillars of postal development;
- Good performers: A score between 30 and 55 shows an upper-intermediate level of performance. These countries are consistent performers and belong to the top 50%;
- Potential performers: A score between 15 and 30 shows a performance that is lower than the median, with countries usually performing only partially well, with some development potential. Most countries in this group exhibit glaring weaknesses in one or more areas of postal development;
- Least developed operators: A score below 15 shows that a country's postal development is very low. These countries are facing major

challenges in several of the key pillars of postal development.

The 2021 ZIPD ranking covers 168 countries with a global average score of 33 versus 36 in 2020. Once again, Switzerland secured the top spot, slightly distancing itself from Germany (2nd, 93) and Austria (3rd, 91), with Japan (4th, 90) and France (5th, 88.4) completing the top five, as we can see in [10].

As in all past editions of the ranking, the group of industrialized countries (ICs) has recorded the highest average score at 68.25, followed by Eastern Europe and the CIS (49.82), Asia Pacific (28.63), the Arab region (25.62), Latin America and the Caribbean (18.74), and Africa (17.85) [10].

Following closely behind the group of ICs, countries in Eastern Europe and the CIS also benefit from a high average score (49.8, Figure 2) [10].

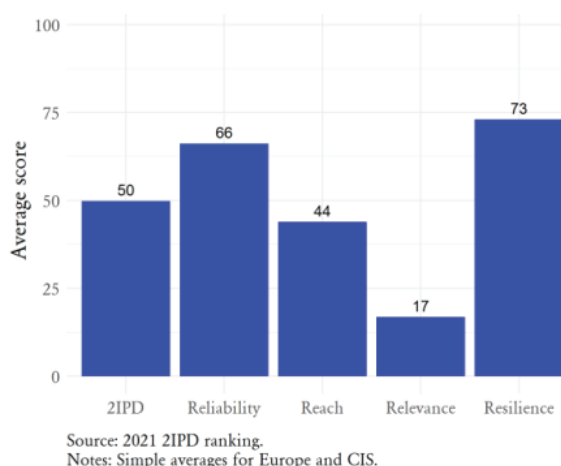


Fig. 2. ZIPD performance in Eastern Europe and the CIS, Source: [10]

4 The sustainable last mile delivery

During the pandemic of COVID-19 the lastmile delivery it got greener. With many people stuck at home, e-commerce sales skyrocketed. When supply chains started moving again, the ecosystem adapted fast, as people purchased more and different products online. Out of sheer necessity, new consumer behaviours and retailers’ responses to them changed last mile delivery’s carbon footprint, making it more sustainable. But these sustainability gains are only the beginning of a whole new opportunity for collaboration. One that could produce a

remarkably more sustainable last mile. But only with action and smart investment.

The carbon footprint of the last mile has long been an environmental and societal challenge. The sustainability gains that came from the pandemic were unintentional. Yet they happened at an ideal time. Now it’s time to get intentional and make the last mile more efficient, less expensive and more eco-friendly. The imperative to act is clear.

Last mile delivery accounts for 53% of the total cost of shipping and 41% of total supply chain costs. With no interventions, we can expect a 32% jump in carbon emissions from urban delivery traffic by 2030 [11]. Consumers need convenience, speed and sustainability at the right price. Lasting change will require bold moves such as incentivising greener choices among consumers and businesses, rethinking asset use, and harnessing data and analytics. The whole last mile ecosystem, post and parcel organisations, retailers, delivery companies, governments and consumers is at a tipping point. Go one way, and it can create a truly sustainable last mile faster, cheaper and greener. Go the other way, and things worsen unchecked. No single entity can solve this problem alone. It will take all ecosystem players working together in ways they never have before.

4.1 The potential of local fulfilment

The acceleration of local or market-based fulfilment is one stand-out impact of the pandemic. Amazon is a pioneer here. The company’s ability to meet its Prime delivery promises has always hinged on its innovative local fulfilment strategy. In March 2020, the e-commerce giant doubled down on its local delivery strategy, investing in a network of new micro-fulfilment centres located even closer to its customers that stock “need it today” items. The goal was to offer more speed and convenience with a lower carbon footprint, stated in [11].

To respond to Amazon’s delivery speed and cost, brick-and-mortar retailers had already been developing capabilities for omnichannel fulfilment using their stores or other local inventory options. The pandemic radically accelerated fulfil-from-store investments by about three to five years, permanently altering supply chains where inventory is placed closer to

customers than ever before. Retailers accelerated these investments as they scrambled to adapt. But these investments won't be rolled back post-pandemic. Now, many more items will come from market-based inventory, which creates an opportunity for new experiences around local fulfilment for consumers and exciting potential for post and parcel and logistics organisations to create a more sustainable last mile.

The last mile supply chain made possible by local fulfilment centers could lower last-mile emissions between 17 and 26% by 2025. Using local fulfilment for even half of ecommerce orders between 2020 and 2025 could lead to significant impacts [11]. The scheme of system of local fulfilment is shown in Figure 3.

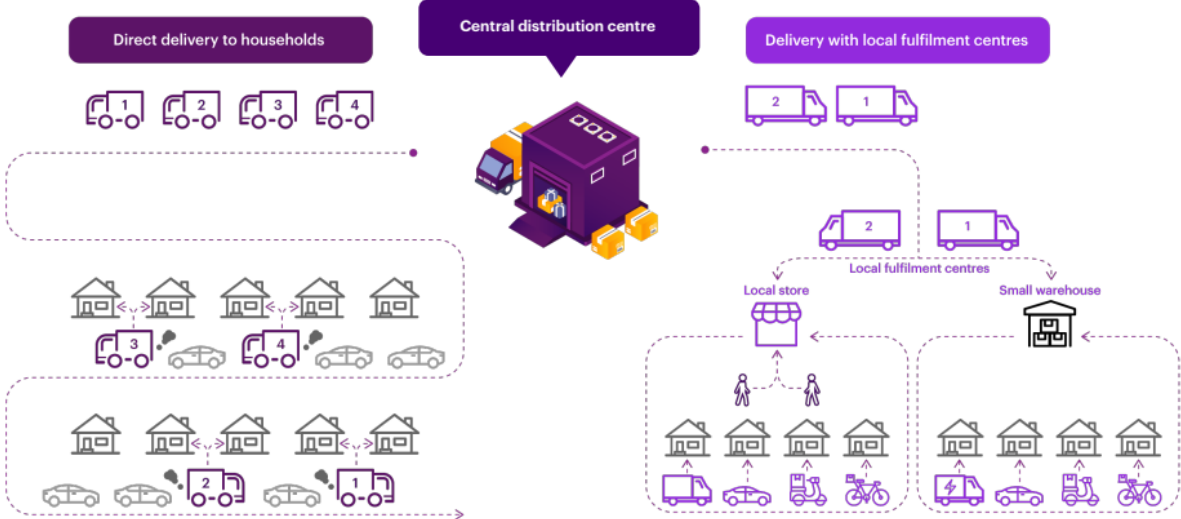


Fig. 3. Local fulfilment, Source: [11]

The last mile is not going to get greener with more investments in traditional processing and distribution infrastructure and delivery fleets. This is about thinking outside the box to deliver the box. It's critical to work across the ecosystem to understand the unseen costs of last mile delivery and pursue change. This means investing smartly in innovative technologies and balancing highland low-impact opportunities. Three fundamentals are key to any plan and success involves coordinated investment and creative even unconventional ecosystem cooperation. These fundamentals are: incentivise greener choices, rethink asset use, harness data and analytics [11].

1. Incentivise greener choices

Making purchases online can be as easy as clicking a button and finding the package at front door an hour later. It's so easy that people don't think about how the shipping option they select, the size of their basket or where, when and how their order is fulfilled impacts the environment. The root issue here is lack of buyer awareness. It's why the last mile ecosystem must make consumers more aware of the environmental impact of delivery options and be more transparent by offering greener delivery choices

at checkout. Many people would choose these greener options, 43% of consumers are more likely to choose retailers that offer more sustainable delivery options [11]. There are also options to incentivise consumers to pick up parcels at local fulfilment centres by offering value-add experiences or discounts.

Cainiao Smart Logistics Network, which is Alibaba Group's logistics unit is locating 30,000 new postal stations in convenient spots across 100 cities in China. The posts support easy, contactless mailing and parcel collection, have services for consumers to track their packages in real time, and use autonomous vehicles to bring parcels to the door step.

Incentivising greener choices doesn't just extend to consumers. City and national governments and planners must weigh the trade-offs they can make to incentivise delivery companies to invest in greener fleets, enable the circular economy and develop greener route management practices. Delivery companies are already investing in electric vehicles. Cities can incentivise further action by investing in electric vehicle charging infrastructure, making them convenient for delivery companies. They can also offer GOV (green occupancy vehicle)

driving lanes, express parking, ticketing and toll exemptions, or carbon credits for green vehicles.

2. Rethink asset use

Assets have a fixed role in the traditional last mile. Warehouses and fulfilment centres store the inventory. Delivery fleets run the routes. Every delivery organisation invests in its own infrastructure, technology, people and vehicles. But as the context of the last mile changes more volume, more velocity and new consumer expectations. It's time to stop building redundant networks and start repurposing assets with sustainability as a priority.

Delivery companies can also enhance cooperation and move to share assets in new ways. Providing access to each other's networks can eliminate costly redundancies and reduce emissions. The United States Postal Services (USPS) is already doing this through its Parcel Select® Service. Other delivery companies, including USPS competitors, can use this ground delivery service to get sorted packages to their final stop at less cost.

Delivery companies and post and parcel organisations can embrace greener practices more economically by sharing delivery infrastructure, including fulfilment and open locker and PickUp DropOff networks that support interoperability. At the same time, cities and regulators can encourage asset sharing. One way to do this is by creating points at the outskirts of cities where deliveries are concentrated for all carriers.

3. Harness data and analytics

Deep customer insight enables delivery companies to pursue more proactive delivery approaches that are kinder to the environment. Take anticipatory shipping, for example. Delivery companies use customer and geolocation data to ensure a package is delivered the first time. By using geolocation to see that a customer isn't home, the delivery company can automatically leave the package in an alternative location per the recipient's known preference. This eliminates exceptions that add cost and extra trips that increase the carbon footprint, as concluded in [11].

With more data delivery companies can make routes more efficient, accounting for traffic and other real-time conditions. They can personalise service level commitments, using longer timelines to accommodate greener routes. They

can assess local traffic and weather patterns in real time. They can integrate route planning with the availability of smart charging stations. All of these data inputs can optimise routes with extraordinary precision, maximizing drop density and reducing complexity and downtime. Cross-ecosystem data sharing via the cloud is key to making it happen.

5 Conclusion

The postal operators are facing unavoidable digital business transformation in the era of the digital economy, Industry 4.0 and innovations. The main trend in postal sector is the increasing competition from electronic substitutes. The continued growth of e-commerce is fueling growth in parcels in postal networks both domestically and internationally as well as in the networks of the integrators and increasing number of private postal operators.

The changes in the postal market require that the postal operators have to develop their postal networks into different directions. Many of the postal operators have replaced their traditional post offices by outsourcing and franchising of post offices to third parties, and leveraging their post office infrastructure to enter new markets, e.g., financial services, insurance services, or high value retailing.

The digitalization has changed the role of the postal sector. There are four main phases in the process of digitalization of postal sector: postal automation, phases of revenue-generating digital services, phase of core-enhancing digital postal services, digital transformation. Also, there are four main drivers of digital transformation in postal sector: automation, digital customer access, connectivity and digital data.

All these drivers of digital transformation of companies and correspondence is having an impact on the core business activity of postal operators. The volumes of letters have been decreasing, particularly in the last couple of years. This leads to loss of revenue. At the same time digital innovations, e-commerce, data collection, and digital identity have been the core of postal operators' efforts to propose new services and adapt their organizational culture and strategy to the needs of the digital economy. All these efforts require a different postal infrastructure as well as different skills and patterns of employment for postal operators.

The impact of digitalization is not new, but the digital economy is entering a new phase that presents new challenges and opportunities. Digital tools are changing how postal operators are structured and how they communicate, and sell. This has triggered the digital transformation of the postal industry in many aspects.

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