

The impact of COVID-19 on digital transformation of the bicycle industry in Portugal:
A literature review

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Author Note

This article was developed as part of the course Research Methodologies and Scientific Communication of the Master's in Electronic Business, lectured by Professor Ana Azevedo.

Abstract

COVID-19 brought big challenges to industries at a global level, which had to reinvent themselves to ensure their future in a short period of time. Many companies were faced with a scenario that required fast digital transformation. This article aims to present the state of the art of literature on COVID-19 impact on the bicycle industry and digital transformation in Portugal. To do so we performed a research for scientific articles to carry out a critical analysis of the literature related to the digital transformation and about the impact of COVID-19 in this sector, and we have noticed that the bicycle industry grew in Portugal during the pandemic, and we also realized that the digital transformation has become fundamental to companies' survival. We intend to go deeper into this topic through a qualitative methodological approach.

Keywords: COVID-19 impact, bicycles industry, digital transformation on cycling, bicycle sector cycling.

Introduction

The world has experienced several pandemics in the last decades, but none had similar implications for the global economy as the COVID-19 (Gössling et al., 2021). When people were forced to stay at home, the role of bicycles changed. The COVID-19 pandemic enhanced concerns over public transportation. The motivation for physical exercise made people start choosing the most basic ways of getting around, leading to an exponential buying of bikes (Bernhard, 2020). As European cities emerge from quarantines, bicycles play a central role in getting the workforce moving again. In urban areas, at least, bicycles are suddenly an unlikely component to restarting economic growth. France, Italy, Britain, and their neighbours are accelerating hundreds of millions of euros in investments in new biking infrastructure and schemes to get people pedalling (Alderman, 2020). Regarding bike-sharing usage, the COVID-19 pandemic impacted urban mobility, while crucial changes are being noticed in travellers' behaviour. Travelers shifted to other transport modes, especially walking and cycling, minimizing infection risk (Nikiforiadis et al., 2020).

This article aims to present the state of the art of literature on COVID-19 impact on the bicycle industry and digital transformation in Portugal. To do so we performed a research for scientific articles to carry out a critical analysis of the literature related to the digital transformation and about the impact of COVID-19 in this sector, and we have noticed that the bicycle industry grew in Portugal during the pandemic, and we also realized that the digital transformation has become fundamental to companies' survival.

This paper is organised as follows: next section presents the COVID-19 impact on the bicycle industry, followed by a section that introduces the methodology for the literature review. The next section shows the results of the literature review, and the next one approaches future research directions, and finally the paper ends with the conclusion.

COVID-19 impact on the bicycle industry

Portugal leads the production of bicycles at the European level, exporting about 90% of the total production, having as key markets Germany, France, and Italy. Even before the pandemic, the bicycle production in Portugal had already increased by 42% in 2020, compared to 2019, breaking the record of 2.7 million euros (Pereira & Gonçalves 2020).

In 2019, EU Member States exported almost 1 million bicycles to countries outside the continent, representing €368 million, i.e an increase of 24% compared with 2012 (Eurostat, 2020).

According to the European Cyclists Federation, Portugal occupies the 8th position considering the cycling investments by the government during the pandemic, spending €0.29 per person, as presented in figure 1.



Figure 1 - Countries spending the most on cycling during the pandemic (Source: Statista by McCarthy, 2020)

In 2019, the bicycle use growth had a big impact on the bicycle industry (Catela & Milheiro, 2019).

According to Velo-city¹ the buying of bikes in Portugal increased during the COVID-19. From traveling to work or just for spare time, thousands of people have found the bicycle as the preferred mean of transport (Velo-city, 2021).

Due the increase in online demand in April, the quantity of bikes in circulation smashed all records during the month of May, in the Portuguese capital- The increased demand for bicycles resulted in a very positive impact for the industry, namely on bike accessories (Velo-city, 2021).

In general, the number of bicycles has increased across Europe last year. EcoCounter refers that eleven² EU countries on average had increase 8% in cycling and the numbers go up more during weekends (+23%) than on weekdays (+3%) (EcoCounter, 2021). In Portugal, the numbers achieved almost +25%, as presented in figure 2.

¹ Velo-city is widely considered as the premier worldwide annual cycling summit, serving as a global knowledge exchange platform (<https://www.velo-city2021.com/>).

² England, Ireland, Sweden, Finland, Portugal, Belgium, Italy, Spain, Germany, France, and Austria.

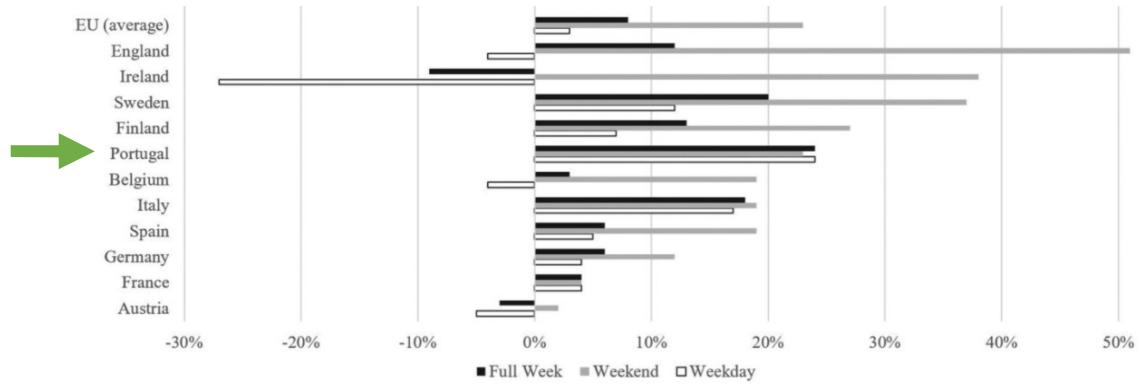


Figure 2 - Percentage change in cycling levels in 2020 compared to 2019 in eleven EU countries, including Portugal, regarding full weeks, weekends, and weekdays (Source: Buehler & Pucher, 2021)

During the pandemic, daily cycling trends also shifted. Probably due the teleworking, the rush hour in the morning has changed (EcoCounter, 2021). Compared to the previous year, during the last twelve weeks of 2020, the bikes were at their peak. Portugal registered a growth of 61% on bicycles usage, such as shown in figure 3 (EcoCounter, 2021).

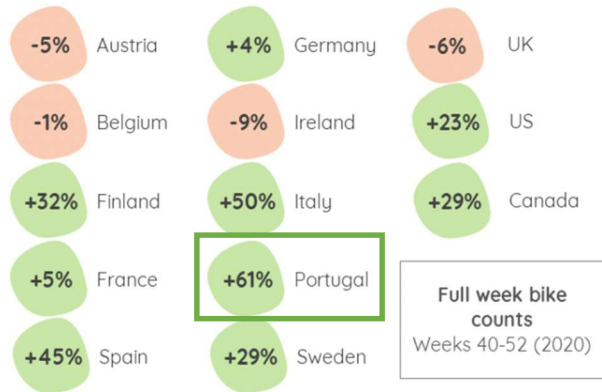


Figure 3 - Bicycle use growth. (Source: EcoCounter, 2021)

England’s Department for Transport published its National Travel Attitudes Study³ which showed that 93% will continue to cycle more once COVID-19 restrictions were finished (Zintl, 2020). The forecast growth for bicycle sales in Europe is up to 30 million per year till 2030 which follows post-COVID investments in cycling sector (Cycling Industries Europe, 2020).

³ The National Travel Attitudes Study (NTAS) is an online and telephone survey which covers responses from individuals aged 16 and over in England, drawn from people who have previously responded to the National Travel Survey (NTS).

Methodological Approach

We performed a search in the bibliographic database B-on, conducted between April 22 and June 11, 2021. We have used the keywords: COVID-19 impact AND bicycles industry (5,360 results), COVID-19 impact AND cycling (6,396), COVID-19 impact AND bicycles industry AND Portugal (1,642 results), digital transformation AND cycling (28,994), digital transformation AND bicycle industry (23,040), COVID-19 impact AND digital transformation AND bicycle industry (2,913 results), COVID-19 impact AND bicycle sector AND Portugal (1,408 results), impacto do COVID-19 AND indústria das bicicletas (138 results), impacto do COVID-19 AND indústria de bicicletas AND transformação digital (59 results), transformação digital AND bicicletas (1038 results), transformação digital AND bicicletas em Portugal (436 results), COVID-19 AND transformação digital AND bicicletas (78 results). The search returned 71 502 articles. We have found articles in related areas, such as bike-sharing, cycling policies, electric bicycles, cycle paths/infrastructures and the impact of COVID-19 on cycling, but not specifically focused on bicycles. The following criteria was applied: relevance, 100 most relevant articles according to B-on ordering, articles presenting the impact of COVID-19 on industries, digital transformation impact on industries, impact of COVID-19 on cycling. According to these criteria, only 19 articles were identified as relevant. The other ones were considered as irrelevant because they are focused on cycling infrastructures, cycle paths, COVID-19 impact on bicycle industry at local level of several countries worldwide.

Results

The pre-selected articles were analysed in detail and the main topics covered are presented below.

Digital transformation overview: origin and concept

Digital Transformation is a concept that has existed since the 1960s, appearing with the evolution of computer science, which impacted several other areas of knowledge (Legner et al., 2017). The origin of the term “digital transformation” can be described from different perspectives, depending on the sector to which it applies or area of knowledge. Industry 4.0, Society 5.0 and digitization are examples of related terms (Klein & Todesco, 2020). Digital transformation can be understood as the application of digital innovation, technology to change, bringing about something totally new, different, and better, generating value for society and for companies that bet on the same change. Transformation can occur in several areas and in different aspects, such as, process, product, service, business model and internal, external, and social relationship. Digital innovation is related to the evolution of technology available to be understood by society (Albertin & Albertin, 2021).

Digital transformation is a positive thing when changes make the company digitally mature, but it can also have a less positive side if organizations find it difficult to adapt to it. In this way, it can affect companies, essentially, in three areas (Pereira & Araújo, 2018):

Customer: The customer experience is one of the main aspects of digital transformation. One of the biggest concerns of companies is to understand the behaviours, desires, trends, and concerns of customers, so that they are satisfied and have a more convenient and happy experience.

Operational processes: The digital transformation cannot only go through the experience with the clients, so there are other aspects to consider, namely the operational processes, such as improving the company's operations, using the digitalization of the processes to train employees, and the performance management.

Business model: Companies seek quickly and efficiently to meet customer expectations. This requires changing the business model, from traditional businesses to disruptive models that guarantee the delivery of products or services in an efficient, agile and with better quality for the best and greatest customer experience and convenience. Airbnb and Uber's disruptive business models are classic examples of the influence of digital transformation, as these could be more traditional businesses, but have completely changed the traditional business model with digital transformation.

Barriers and benefits of digital transformation

Currently, it is necessary to adopt digital transformation. Organizations need to be more effective and efficient. Digital has the advantage of accelerating and developing processes, but, like everything, there are also barriers to its implementation.

Speaking about benefits, Albertin & Albertin (2021) referred that there are a few benefits that we can find on digital transformation such as efficiency (which increases customer satisfaction), new positions creating new functions, competitive advantage, processes simplification and renovation/remodelling of business models. On the other hand, the same authors referred as barriers that the digital transformation must include the organization as a whole and not just focus on the customer. IT companies are only responsible for what concerns them, there must be a strategic plan on the part of the company (Albertin & Albertin, 2021).

COVID-19 and its impact on digital transformation

Digital transformation has become indispensable for the continuity and evolution of the industries, having gone from being optional to being mandatory. Organizations must implement the digital transformation process today, to guarantee their future (Rabelo, 2020). A new paradigm is now available to all entrepreneurs, who now have an opportunity to adapt to new consumer trends and

acquire valuable resources for their businesses. The companies' adaptation to this new digital landscape is inevitable for their survival in the global market (WayNext, 2018). As digital technologies have been changing the essence of organizations, digital transformation has become an integral part of their daily routine (Porto Business School, 2020).

For the current year, more than half of the world economy is expected to be digitalized (WayNext, 2018). However, according to International Data Corporation⁴ data, Portugal only has 30% of digital organizations, once only 37% of the total companies currently have a digital transformation strategy aligned with their strategy of business.

The COVID-19 pandemic has speeded up the digitalization of companies and whole industries (Soto-Acosta, 2020). But some recognized department stores, who were already selling online, failed to meet delivery deadlines during the lockdown, due to the lack of internal processes optimization (Soto-Acosta, 2020). Even though digital transformation includes new business models concept or significant changes to existing ones, it doesn't indicate that companies need to forsake their current business models but it means that new digital businesses or digitally improved businesses generally go together with the existing ones (Soto-Acosta, 2020).

A 1998's study noticed that 46% of early users were frequently buying online and only 8% of late users had a shopping experience on the web (Howland, 2020). But a new study done in the United States about online shopping shows that 37% of respondents considered switching to online shopping after COVID-19 (Morning Consult, 2020). Additionally, the late adopters are inspired to shop online as there is no option. In this survey, 11% of Generation Z, 10% of Millennials, and 12% of Generation X, and 5% of Boomers made their first purchase online during the pandemic. Subsequently, at least 66% of Gen Z, 68% of Millennials, 73% of Gen X, and 68% of Boomers assume that they started to buy online due to the COVID-19 and they believe this habit will continue after the pandemic. In terms of buying online, late adopters also said that once the experience happened safely, they will have no problem repeating the same post-COVID (Kim, 2020). Even though customers were already buying more online before the pandemic, it has further accelerated this trend and prompted not only the labour force, but the customers to do the digital transformation (Kim, 2020). In the United States, e-commerce sales grew five times more when compared to in-store retail, approximately 90% of retail sales in 2019 happened

⁴ International Data Corporation (IDC) is the world's leading company in the field of market intelligence, consultancy services and event organization for the Information Technology, Telecommunications and Consumer Electronics markets.

instore (Department of Ecommerce, 2020). It is expected that online sales increase considerably, so the industries will need to invest in resources to make their online businesses more efficient (Kim, 2020).

Future Research Directions

During the article writing we found out some gaps in the literature. As far as we know, there is no scientific research on the expectations of the bicycle sector in post-COVID-19 in Portugal and digital transformation impact on bicycle industry in Portugal. It means that we will explore these issues as future research directions.

A semi-structured interview will be conducted asking about the before, the during and the expected after COVID-19 pandemic, to analyse whether there has really been a digital transformation or if it is simply a forced adoption to the new reality that will not continue after that. The interview will be made to the CEO and to the Marketing Director of a Portuguese top bicycle brand. The CEO will be interviewed from a perspective focused on the Portuguese market, whilst the Marketing Director will be interviewed from a global perspective. A thematic content analysis of all data collected during the interviews will be made.

Conclusion

This article presents a literature review with focus on COVID-19 impact on the bicycle industry and digital transformation in the world, emphasizing Portugal. Some of the main concepts related to this topic are discussed.

With the conclusion of this article, we have noticed that the bicycle industry grew in Portugal during the pandemic, but we intend to go deeper into this topic through a qualitative methodological approach. With the literature review we realized that the digital transformation has become fundamental to companies' survival, which should be an integral part of the growth and evolution strategy of organizations. Companies that have not yet invested in the digital transformation process are unlikely to survive, so it is crucial to act now to guarantee their continuity soon. Digital transformation can, therefore, be seen as a fundamental leverage factor for the success of any organization. In an increasingly digital world, it is practically impossible to think of a business strategy, namely electronic, that does not cover this area of digitalization.

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