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# Mobility and Regional Competitiveness in the Digital Age

**Bence Zuti**

PhD Student, University of Szeged, Hungary  
zuti.bence@gmail.com

**ABSTRACT:** Digitalization is one of the key drivers of accelerated change in our everyday lives, both on an economic and social level. With solutions enabled through ICT technologies, we are more connected than ever on the global scale. In this next chapter of globalization, we currently experience significant transition in the structure of industries, consumer behavior and how we collect and manage data. This transition requires a shift in mindset, as we need to reevaluate the key factors of competitiveness, in order to prepare ourselves for rapid and presumably disruptive changes. These changes, however, mean to ease our everyday lives in the long run. The presence of an advanced regional infrastructure is a crucial factor in enhancing the competitiveness of regional economies, hence the opportunities in mobility in the digital age need to be revised. The aim of the paper is to systematize the key connections between digitalization, mobility and regional competitiveness while mapping potential challenges in the topic as well. **KEYWORDS:** regional competitiveness, digitalization, globalization, regional mobility, urban mobility

## 1. From Globalization to Digitalization

Globalization is a phenomenon which influenced norms, traditions of society and facilitated the emergence of a complex and interactive global economy (Lengyel 2010, 32). Initially, the key drivers of globalization were the trade and exchange of



material goods, however today, the significance of immaterial assets has increased. Knowledge, information and data can be considered as core drivers of growth and development (EC 2017b, 6).

With advancements in technology, the presence of digitalization has changed the course of globalization. Digital solutions, platforms, flows have become widespread around the globe. Actors of economy and communities of society became able to communicate more efficiently by reaching more people at a lower cost. This means that global competition is open not only for multinational organizations, but to individuals as well (Manyika et al. 2016, 1). The rapid growth in terms of communication means that data flows are higher, information, knowledge and ideas are more accessible around the globe and value creation can be more efficient, even exponential (Manyika et al. 2016, 2).

**Table 1. The Past and Present of Globalization**

<b>Aspect</b> ↓	<b>Period of Globalization</b>	
	↓ 20 <sup>th</sup> Century	↓ 21 <sup>st</sup> Century
<i>Main value category</i>	Tangible flows of physical goods	Intangible flows of data and information
<i>Networks</i>	Flows mainly between advanced economies	Greater participation by emerging economies
<i>Flows</i>	Capital- and labor-intensive flows	More knowledge-intensive flows
<i>Infrastructures</i>	Transportation infrastructure is critical for flows	Digital infrastructure becomes equally important
<i>Core actors of innovation</i>	Multinational companies drive flows	Growing role of small enterprises and individuals
<i>Transactions</i>	Flows mainly of monetized transactions	More exchanges of free content and services
<i>Dissemination of Knowledge</i>	Ideas diffuse slowly across borders	Instant global access to information
<i>Technology Transfer</i>	Innovation flows from advanced to emerging economies	Innovation flows in both directions
<i>Global Interactions</i>	Global supply chains	Global value chains

Source: Own construction based on Manyika et al. (2016, 5) and EC (2017b, 10)

While the 20<sup>th</sup> century is described with the flow of physically tangible goods, the drivers of the 21<sup>st</sup> century are intangible data and information. In the past, these flows occurred between developed countries and economies or multinational companies, however today, the competition is more open, as developing countries, emerging economies, SMEs or individuals can also create high added value and be visible on a global level. There is a transition from labor-intensive flows to knowledge-intensive flows (Manyika et al. 2016, 1).

Nowadays, digitalization has become a popular buzzword throughout the globe. We are experiencing a shift in our lives from both economic and social aspects in this current phase of globalization (Kovács 2017a, 823, Kovács 2017b, 971, Manyika et al. 2016, 1). Digitalization triggered a worldwide phenomenon, commonly referred to as the Fourth Industrial Revolution. This revolution is characterized by technology-oriented solutions in all industries, the dependence on data flow and the crucial presence of communication networks (Kovács 2017a, 825).

We are surrounded by a smart environment in which people are always connected to the Internet via smart devices (Yoon 2017, 75). With this, our existence is present in the material and virtual world simultaneously, which is a radical change in the world (Schwab 2017, 1). The definition of geographical proximity, consumer behaviors, strategic visions, legal regulations, mainstream concepts need to be reevaluated, as change is rapid, like never before (Lengyel 2009, 14). A transition in how we think about the structure of economy, society and the status of environment and policies is necessary. The flow of capital, human resource and technology has reached a next level (TWB 2002, 3). We are also more connected and networks around the globe have become more complex (Lee and Vivarelli 2006, 2). Meanwhile, the national economies have a decreasing potential, while the role of regions, cities, individuals is continuously increasing (Lengyel 2010, 55). With all of these facts taken into account, we can establish that digitalization is a transformative process (OECD 2017, 3).

Our economy and society are difficult to be imagined without a supportive digital environment as it currently highly relies and builds on the solutions and opportunities brought by digitalization (Piccinini et al. 2016, 55). Technology, a fundamental driver of efficient operation has also become a trigger for novel innovation and a basis of disruption as well (WEF 2016a, 3). Through this potential disruptive impact, several challenges need to be addressed on a global scale. From the perspective of economic actors, a crucial challenge is to understand the changing needs of their customers and how they communicate with them. The traditional paradigm of companies providing either products or services is ultimately challenged. Customers expect to gain personalized, relevant experience beyond this traditional paradigm with the help

of technology. Customers increasingly prefer to be able to rapidly access products and/or services if required, rather than being owners in the long-run (WEF 2016a, 4).

With the revealed opportunities granted by digitalization and solutions provided by technology, new challenges also rise, as we are entering a domain that remains mostly unexplored by mankind.

## 2. Regional Competitiveness in the 21st Century

The concept of regional competitiveness is a highly debated topic among academics, policymakers, consultants, politicians, planning experts and actors of economy (Dijkstra, Annoni and Kozovska 2011, 3, UN-HABITAT 2013, 7). It is also one of the most discussed topics of today (UN-HABITAT 2013, 1). The interpretations of regional competitiveness can be grouped into two main categories (Huggins et al. 2014, 256). Through the interpretation of the first group, competitiveness cannot be defined in case of territorial units, it can be recognized only in the case of enterprises. Those who agree with this statement, competitiveness is only discussed on a microeconomic level (Lengyel 2010, 101). Through the interpretation of the second group, competitiveness is a valid definition related to territorial units as well. The popularity of the concept has risen by the fact that by globalization, nations, regions, cities also compete on a global level for resources, capital or talent, as enterprises do. This latter group claims that competitiveness can be interpreted on micro- and macroeconomic levels as well (Lengyel 2010, 104). In this paper, the idea of competitiveness is recognized both on micro and macro levels.

There are numerous ways to define competitiveness. The standard definition is the following: *“competitiveness is defined as the ability of a region to generate, while being exposed to external competition, relatively high income and employment levels. In other words, for a region to be competitive, it is important to ensure both quality and quantity of jobs”* (EC 1999, 10).

Based on the definition of Annoni, Dijkstra and Gargano (2017, 2), *“regional competitiveness is the ability of a region to offer an attractive and sustainable environment for firms and residents to live and work”*.

Based on the definition of WEF (2016b, 4) *“competitiveness as the set of institutions, policies, and factors that determine the level of productivity of an economy, which in turn sets the level of prosperity that the country can achieve”*.

We can see that these definitions focus on productivity, high levels of income and employment and the presence of attractive and sustainable economic and social

environments, hence competitiveness is more than a single dimension, it is to be interpreted as a set of hard and soft dimensions that are interconnected with each other (Lengyel and Rechnitzer 2013, 422, Huggins et al. 2014, 256). It is also important to highlight that competitiveness is an ability and not a condition.

With digitalization gaining more dominance with every day, it was inevitable to embed competitiveness in a digital context. The IMD (2017, 19) has come up with a definition of digital competitiveness, which *“is defined as the capacity of an economy to adopt and explore digital technologies leading to the transformation in government practices, business models and society in general. In this way, firms increase the opportunities to strengthen future value creation”*. This definition also focuses on interpreting competitiveness as an ability and also incorporates the significance of adaptation skills in a future-oriented manner. This reevaluation was necessary as economy and society both experience dynamic changes and disruptions at the same time. Digitalization needs to be taken into account to be able to measure the adaptation of new technological solutions. These solutions can contribute in a valuable way to increase productivity and the overall quality of life (IMD 2017, 18-19).

The main framework of the IMD World Digital Competitiveness Ranking consists of 3 key factors: knowledge, technology and future readiness (IMD 2017, 20). The first factor, knowledge consists of 3 sub-factors: talent, training and education and scientific concentration. From the aspect of the knowledge factor, the creation, dissemination and practical implementation of knowledge are key determinants of competitiveness. The creation and maintenance of a valuable talent pool is crucial as well as the establishment of digital strategies. The knowledge factor represents the inevitable infrastructure that serves as a basis for digital change, academic and professional exploration (IMD 2017, 20).

The second factor, technology consists of 3 sub-factors as well, these are: regulatory framework, capital and technological framework. From this point of view, an open, enabling legal, political and regulatory framework acts as a foundation to create an accessible flow of ideas and innovations. It is also key that the industry also acts as drivers of change through innovation and investment in the future (IMD 2017, 20). The third factor, future readiness is built up of 3 sub-factors: adaptive attitudes, business agility, IT concentration. This factor considers, how the uncertainties of technological change affect the attitudes and behavioral patterns of economy and society. Future readiness is flexibility and agility in a changing global environment (IMD 2017, 21).

It is an accepted concept that advanced regional transport systems positively contribute to the agile operation of regions and cities, as transportation (Kiel, Smith and Ubbels 2014, 81). The high-level state of these transport systems is necessary for the

flow of goods, services and people, so in an indirect way, they have an effect on the competitiveness of the territorial unit (EC 2017a, 6). This is why it is important to highlight and reflect on the new opportunities and challenges related to urban mobility.

### 3. The Future of Urban Mobility

Urban transportation and mobility are popular research topics of today, as this industry faces rapid and dynamic changes on a daily basis due to digitalization. The expectations and opportunities residing in this industry are huge, however there are numerous concerns, challenges that need to be addressed and consumer behaviors that need to be mapped in order to maximize the potential of the transportation sector (Piccinini et al. 2016, 63). Urban mobility is an important factor in most territorial units' everyday lives, as it is an enabler of access to either resources or destinations (Piccinini et al. 2016, 55). The integration of digital technologies into mobility solutions is expected to partially or fully solve current problems while being aligned with megatrends of urbanization, consumer behavior changes and sustainability (Piccinini et al. 2016, 55-56). Benevolo, Dameri and D'Auria (2016, 15-16) lists a number of challenges regarding urban mobility, which can be viewed as challenges as well:

- ✦ reducing pollution,
- ✦ reducing traffic congestion,
- ✦ increasing people safety,
- ✦ reducing noise pollution,
- ✦ improving transfer speed,
- ✦ reducing transfer costs.

The planned reduction of environmental, safety and congestion problems will be realized through new sensor and connectivity solutions, information exchange systems. By implementing this, vehicles will also become smart devices that will be able to communicate with each other and will be able to process and analyze data of their surrounding environment swiftly (Piccinini et al. 2016, 56).

Litman (2017, 6) emphasizes that the target objective is to increase the accessibility in urban areas. He defines accessibility as "*the ease of reaching goods, services, activities and destinations, which together are called opportunities. It can be defined as the potential for interaction and exchange*" (Litman 2017, 6). Based on this idea, we can state that contemporary mobility is a multidimensional concept. It consists of vehicle technology

solutions, as these are fundamental from the aspect of travel. It consists of intelligent communication systems, as connected vehicles gather and analyze real-time data flows from their environment in order to make optimal and efficient choices. Offering new services and business models are also integral parts, as consumer behaviors are in a transitionary phase. Ridesharing, bikesharing even through mobile applications is a more and more common thing. These new solutions contribute to making the transport system broader and easily accessible for consumers (Jeekel 2017, 4305). The existing paradigm is shifting from products themselves to mobility as a service (MaaS) (Goodall et al. 2017, 114).

Digitalization is surely forming the stage of urban mobility. The overall goal is to create a system of travel experience that is smooth, cost-effective, punctual and safer than current transportation systems (Piccinini et al. 2016, 55). However, new challenges have risen that need to be solved. These challenges can be grouped into several categories. Challenges related to regulations and government relate to the permissiveness of legislations regarding the introduction of new types of mobility services. Challenges are present regarding social attitudes as well. Conditions of ownership, safety need to be strengthened so the growth and framework of sharing economy can be solidified. Challenges arise from technology development as well, as early results of testing new types of transport directly influence how the market will change in the future. This affects future investments and the attitude of stakeholders. Threats also appear when it comes to cybersecurity and the protection of data. The establishment of renewed, contemporary communication standards and protocols is necessary, and personal information that can be used for identification needs to be protected (Corwin et al. 2015).

## Conclusions

Nowadays, digitalization a key driver of change from an economic and social perspective. With the spread of technology-related solutions, our society is more connected globally than ever before. We currently experience a significant transition in the structure of industries, consumer behavior and how we collect and manage data. Due to this, a shift in mindset is required. We need to reexamine the key factors that drive competitiveness, in order to be prepared fast and disruptive shifts in our lives. The aim of the paper was to systematize the key connections between digitalization, mobility and regional competitiveness, while mapping potential challenges in the topic as well We are in complex environment, where there are a lot of uncertainties

related to industrial disruption and change and there is a need for testing possible future mobility scenarios. The possible opportunities and threats need to be debated on an academic, industrial and governmental level as well. In the age of digitalization and there is a need for a multidisciplinary discussion on the future of our economy and society on a global level. This study serves as a basis for a broader future research and identifies how digitalization, competitiveness and mobility are connected in a complex and interactive way.

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