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THE IMPACT OF THE COVID-19 PANDEMIC ON THE DEVELOPMENT OF THE MAAS

Key Words
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Abstract

From a global perspective, international trends and the expansion of urban areas are the cause of increased demand for travel, and thus transport, which in turn leads to the impossibility of organizing the above in the same "neighborhood". As transport infrastructure measures are mainly based on the traditional benefit-cost ratio, new and innovative approaches to the transport sector are needed.

In this context, MaaS – Mobility as a Service, as a key emerging concept, aims to establish combined and / or integrated mobility as a service. The idea is to sell passengers a personalized package of multimodal mobility services (car sharing, public transport, taxi, bicycle), which is paid in only one transaction for each trip or time period, instead of separate transactions with each individual transport provider.

The digitalization trend and the global COVID-19 pandemic, which has increased teleworking and reduced demand for mobility, have also indirectly affected the development of this service. In that case, certain market sectors could develop, but in the current situation of the COVID-19 virus pandemic, collective transport is losing its share as a way of traveling. In the long run, COVID-19 could have a lasting impact on mobility as it encourages changes in the macroeconomic environment, regulatory trends, technology and consumer behavior.

1. INTRODUCTION

The occurrence of bottlenecks, traffic congestion, increased fuel consumption and environmental pollution are the fundamental problems of large urban areas, especially if it is a tourist area where the local population use the roads and visitors also who are always looking for some kind of transportation during or after their stay. Given certain criteria of local economic, social and environmental policy, mobility services should be adapted to different target groups, and without modern technical and operational solutions new services cannot be compatible with the current private transport system, which means that transport providers and the IT sector must be closely integrated into development, including a unique travel opportunity. The introduction of the MaaS (Mobility as a Service) concept is reflected in the reduction of dependence on private cars with a strong emphasis on changing the user's daily life. Thus, the concept is designed for all citizens to meet their needs for seamless travel mobility from point A to point B, ease of booking and payment of all integrated services through a single platform. Also, MaaS opens up the possibility for visitors to access a wide selection of public and private carriers via a digital platform at their fingertips. The trip for each user is planned separately according to the previously collected data on the demand and supply of transport services, combining them with information on the preferences of the participants themselves. Simply put, the traveler can plan, book and pay for any trip, anywhere and at any time.

2. MAAS CONCEPT

Public transport operators have made considerable efforts in recent years to provide a single public transport ticket in such a way as to enable all passengers to use the services of different carriers in the same city or region. However, following trends and the use of new modes of transport, changes in the lifestyle of younger generations, the trend of urbanization, changing user expectations, urban innovation, the rapid growth of technology - all of the above affects and shapes future mobility. Transport policy makers have been trying for years to make public transport more attractive to allow a gradual transition from private cars to more alternative modes of transport, which can mainly be achieved through new modern mobility technologies that must provide a high level of flexibility and accessibility [1].

With the introduction of the new Mobility as a Service (MaaS) trend, the situation will be visibly different, so the first key change will be that transport users and service providers communicate about their needs at some point through their digital service platform. Another key change is the emergence of a whole new package of shared services, which means that users will be freer in terms of their expectations, so multiple operators (multiple types) of transport services will specify more accurate features of the transport service: arrival time, origin and destination, degree of flexibility, type / the level of comfort required, the price he is willing to pay, etc. By offering a wide range of services, providers will be able to accept or reject users, depending on their expectations, while regulators will easily monitor service availability and adjust market strategy and policy decisions accordingly. This should

result in customer-led services that adapt to real market conditions at any time and in any place, to the general benefit of all stakeholders involved [2].

2.1. Brief History About MaaS

Nico Tschanz and Hans-Dieter Zimmermann presented the first vision of the concept of mobility as a service (MaaS) in 1996 at a conference in Innsbruck, Austria. Their idea was a "smart information assistant" that will be used as a platform for transport service providers where they can search, combine and book trips as well as access to other services such as hotel reservations, insurance purchases, etc. [3].

Sampo Hietanen, CEO of a non-profit organization from Finland that deals with the improvement of intelligent transport, presented the concept of MaaS, in the true sense of the word at a conference at the Heurek Science Center, 2014. His basic idea was based on observing mobility through the needs of users who should replace the purchase of a car by purchasing services and combining different modes of transport, in order to optimize the flow of traffic. For this concept to work, switching from one means of transport to another must be as easy and comfortable as possible for users, and all transport must stand behind one service, application, where laws and regulations must be aligned with user and application interfaces, technology and billing options [1].

2.2. Application *WHIM*

The concept underlying the MaaS is that urban mobility must become fully multimodal, while access to a wide range of services will be coordinated through different service providers, given the fact that the digital revolution can offer new opportunities for all involved. To trust the MaaS service provider that manages the platform and join the integrated mobility offering, business partners expect impartiality and fairness to be stable and reliable enough to stay in the market in the long run. Mobile service operators must also have full confidence that the MaaS service provider will provide quality service to its customers. As the development, deployment and effective implementation of MaaS rely heavily on data availability and management, issues related to data exchange and related business models should be considered as part of the urban mobility tool and strategy.

In order for the MaaS to develop, public authorities need to facilitate access to and availability of high-quality data and must set up a framework to ensure that they themselves have access to data from different (public and private) data sources. Using information obtained and collected in real time on the demand and supply of transport services and combining them with information about customers, the service provider (MaaS Provider) plans trips for users, tailored to their needs, where to travel, when to be at destination, etc.) and wishes (choice of means of transport, with whom they want to travel, what additional services are offered during the trip, etc.). The trips may consist of several sections on which the service is provided by different companies, but for the passenger it is only one trip, which is arranged by one instance and contact. The same instance agrees with the client on a payment

solution that allows him to pay for the trip in one transaction, either for one trip or through an account that is charged once a week or monthly [4].

Whim was first introduced in 2015, after which the application as such expanded to other cities (Antwerp, Birmingham and Vienna) and also began working with carriers in two major Asian cities, Tokyo and Singapore. With a subscription to Whim and its mobile app, the user can purchase a public transport ticket, order a taxi and rent a car or public bicycle. Whim has different pricing models - pay on the go, subscription to fixed price modes offered, or a combination of the above [5].

3. MAAS AND THE COVID-19 VIRUS PANDEMIC

MaaS's ambitions go beyond simply launching for a smartphone app, which facilitates access to a range of mobility services. The desire to adopt the concept as a solution is widely supported with the primary goal of achieving ambiguity in urban mobility, in order to reduce the negative impact of increased external costs. Currently, advocating for the benefits of multimodality is a major challenge. Experts argue that attention must be focused on a horizon that does not require such radical changes in everyday life. Certain market sectors could develop, but in the current situation of the COVID-19 virus pandemic, collective transport is losing its share as one of the modes of travel. Also, the largest metropolises around the world are committed to achieving reduced CO_2 emissions by 2050. The Paris Agreement and several United Nations documents highlight the need to reduce greenhouse gas emissions by 40% over the next 10 years. Experts argue that efforts to achieve the goal must focus on reducing local travel, ie distances that are less than 80 kilometers because they make up 70% of all emissions. In this context, the MaaS seems to be the only way to launch the much-needed promotion of modalities and decarbonisation of transport, simplifying and expanding access to alternatives to private vehicles [6].

The COVID-19 virus pandemic, which followed in early 2020, was an economic shock for many sectors, showing a significant drop in GDP for many EU countries. In the long run, COVID-19 could have a lasting impact on mobility as it encourages changes in the macroeconomic environment, regulatory trends, technology and consumer behavior [7].

Trends, however, may vary by region, so the responses and outcomes of mobility professionals will vary by location. The public transport sector is particularly affected, both large-scale travel (air, rail, bus transport) and daily travel. During the lock-up period, the use of urban public transport has dropped dramatically to avoid social contact and reduce the risk of infection. Routine activities such as work, study, socializing, shopping, etc., are now performed safely, within the four walls of the house. The first change is reflected in the reduction of demand for mobility, and the reason for this is the restrictions and implemented measures that have led to a reduced need for transport, but also to a positive impact on the environment to reduce greenhouse gas emissions.

As the pandemic continues, physical distance has and will have a significant impact on behavior and mobility tendencies. Many will switch to a mode of transportation

that reduces the risk of infection, but the exact shifts will largely depend on their habits before COVID-19. People who own a private vehicle will increasingly use it, while those who previously relied on public transportation could switch to other means, such as cycling or walking.

Since the start of the pandemic, cities have gradually taken steps to slow the spread of the virus in public transportation. These are the measures taken at the earliest when the pandemic began, so locking measures reduced people's ability to move around the city, and their relaxation and ability to move more freely was accompanied by fear of using public transportation. According to experts, the risk of infection in public transport is related to the time of exposure, the behavior of drivers and the use of self-protection measures, the large number of people and ventilation conditions [8].

According to several studies conducted in Germany, France, the UK, the US and Japan, the risk of contracting COVID-19 while traveling by public transport is between 0% and 1.2%. In order to respond to the concerns of passengers, cities and road authorities responded to the situation by implementing the following measures: establishing new protocols for regular cleaning of vehicles and buildings, the use of masks, automatic opening / closing door when entering / exiting passengers, limiting the capacity of the vehicle, the use of funds for disinfection, regular air ventilation, physical distancing, contactless payment and increasing the frequency of services during peak hours.

The crisis of reduced mobility has also impact shared mobility services and e - scooter, bicycle, moped and car service providers. Most people did not believe that car sharing and shared micro-mobility (bicycles, e-scooters and mopeds) were a safe option to travel during the pandemic, which posed serious challenges for cities and service providers looking to increase the share of more sustainable modes of mobility. During the first months of the pandemic and subsequent closure, several cities took action in this regard. If no active measures are taken to get people back to using public and active modes of transport after a pandemic, cities will move from blockade to standstill. Such measures will need to specifically address people’s mistrust or fear, as well as other mobility-related behaviors developed during a pandemic. A measure taken by many cities during the pandemic and particularly highlighted in the media is the widening or creation of new bike lanes, in many cases, taking up space from motor vehicles and giving it to bicycles. Not only has the incentive to use bicycles been in line with many mobility strategies, but it has also proven to be a noticeably safe way to travel during a pandemic. In many cities, some time is needed to improve the infrastructure of bike paths, and the pandemic has helped speed up those plans.

Temporary infrastructure, better known as pop - up bike paths, has proven to be a good strategy and as such can be considered a viable solution. It seemed likely that cities learned a lot during the first wave and are now implementing it, while adapting short-term actions to long-term measures, and also applying strategic planning for long-term change and investment. Most thinking and learning is at a very early stage, and much of the strategic thinking has been put on hold during the crisis. So far, the actions have been mainly based on the city's own experience, and there is a

significant difference in the actions taken as well as on the perceived need for longer-term changes in mobility strategies and innovative transformation of the mobility system. At the same time, the exchange of ideas and solutions is increasingly supported by a multitude of resources, gathering good examples, reports and research, creating a multitude of knowledge from which cities can benefit. This is valuable because long-term strategic decisions in cities on the future mobility system must be based on best practice, taking into account both the pandemic and the wider set of requirements for sustainable urban systems.

4. CONCLUSION

MaaS has the potential to bring various benefits to cities, which largely depend on the market structure and the chosen operational model, as well as the governance model, service specifics and the involvement and effectiveness of all factors, including local / regional / national authorities. In fact, users are offered the opportunity to easily choose the mode of transport that best suits their requirements for each individual trip. MaaS can take into account general user preferences related to travel aspects such as speed, comfort, safety, price, etc. It could also provide better intermodal connectivity within the region. Although traditional public transport services, such as buses, trams and taxis, are well used in urban centers, the same does not apply to suburban and rural areas and to services provided early in the morning or late in the evening. A clear view of all modes of transport will make the real cost of mobility more transparent, and an efficient combination can save costs for users. Also, it could be used for social inclusion, reduced isolation and improved access to services, education, employment and social interaction. A tailored approach to the MaaS can offer inspiration for the development of sustainable transport solutions for all citizens, especially those who find it difficult to use traditional public transport, such as the elderly and the disabled, facilitating access to door-to-door transport. This creates a situation in which the essence and format of innovation and mobility need to be considered, with learning in the practical part. It is necessary to take action in the coming years, both short-term and long-term, in order to transform mobility systems in line with future requirements. This drive for transformation, the many stakeholders involved, the complexity of the challenges and the size of funding are parameters that emphasize the need for cities to prepare and organize for innovation. In conclusion, there is an urgent need for innovative measures and the transformation of the mobility system.

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