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THE HUMAN TOUCH

The automation and digitalisation of public transport services seek to increase their efficiency in terms of environmental impact, cost and service quality. But can machines truly fulfil the needs of the human users they are supposed to serve?

Digitalisation and automation are transforming our daily lives with new and more efficient services, like machine distribution of metro tickets and digital journey planning applications. But do these innovations truly answer public transport passengers' needs?

As current research addresses the job losses and re-skilling needs related to new services, a more user-centric approach is therefore required.



wetransform

Route planning application
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Citizens at the forefront

As much as public transport becomes digitalised and automatised, its reason for existence remains the same: to serve its (diverse) passengers.

Automated and digital services are essential to fulfil the specific needs of defined user segments. They provide autonomy and time-savings to passengers, who can discover and book the best route without asking for directions or combining multiple information from different sources. Young adults, for example, particularly value technology-rich transport options and make use of various mobility modes, demanding more reliable and individually adapted public transport services, which can only be achieved with some degree of automation and digitalisation.

Other user segments such as people with reduced mobility or vision can also highly benefit from automated and digital services like automatically adapting green lights timing length, as the Mobilidata pilot showed in the City of Antwerp (BE) as part of the EU-funded project INDIMO. Indeed, automation and digitalisation can go a long way when it comes to making mobility, and therefore our cities, more inclusive and accessible.

However, there are some challenges associated with the process. Automated services struggle to serve unpredicted or specific needs due to their standardised decision-making process and cannot encompass the diversity of user profiles and needs, and thus, their various degrees of digital literacy, sensory, motor, and cognitive abilities and states.



Moreover, the absence of system error in automated vehicles cannot be guaranteed, and liability without human drivers remains ambiguous. The driverless shuttles currently piloted across Europe highlight the lack of trust of passengers in the complete absence of a human being in the vehicle, despite their positive impressions when it comes to the comfort of the ride. Tests conducted in the city of Tampere (FI) in the framework of the SHOW project especially underlined passengers' criticism toward vehicle accessibility when boarding or exiting, as well as their demand for more communication.

Trust is critical in automated systems.

Users need to either know how things work or accept that they do not know and trust. As digital and automated tools are enhanced with communication capabilities powered by Artificial Intelligence (AI), users expect natural communication with technology. As this expectation does not come true, distrust risks leading to public transport desertion; this is a common phenomenon, as explained by Jose Solaz, Head of Innovation at IBV, who is involved in the EU-funded SUuaVe project: 'Failures in empathy are at the basis of the "uncanny valley" phenomenon, ie the eerie and unsettling feeling people experience when dealing with human-like systems.'

Varberg AV Pilot

PAV

Defining the right automation level

Requirements for highly efficient services are difficult to reconcile with the social and human interaction needs of passengers, challenging the idea of a 'right' level of service automation in public transport. Nevertheless, some type of criteria is needed to define how automation and digitalisation best serve public transport. In comes WE-TRANSFORM!

This EU-funded project, focused on addressing the impacts of transport automation on the workforce, gathered diverse stakeholders in several sessions to identify these very much-needed criteria, based on discussions of expected passenger needs in automated and digital services, implications for transport workers, and related requirements for decision-makers.

The first conclusion they reached during this stakeholder consultation is that fixed and routine services are the easiest to automate and digitize; this is because these services are planned and implemented through pre-established procedures and protocols, and therefore, do not require decision-making. Supporting decision-making with automated and digital processes is highly complex, as it relies on an infinite number of factors with unclear causality relations. Neurology and psychology should work together with engineering and economics to define anticipable decision-making processes – a key condition to bring automation and digitalization in.

A second conclusion was that transport operations can be divided into functional tasks (fleet management, infrastructure and operations monitoring and maintaining) and passenger-related tasks, which require empathy, heuristics, and versatility. Identifying non-replaceable work characteristics by algorithms and machines will help define future transport jobs, helping design education programs accordingly and orientate technical research.

Last but not least, a third conclusion was that automation and digitalisation should be used as tools to advance public transport as the backbone of urban mobility and not as an end in themselves. Their potential must enable improvements in individual services and, most importantly, the integration of different modes and services. Used as such, they can, by improving public transport, help reduce emissions, reclaim urban space from private cars, and increase freedom of choice and movement for citizens.

Though the 'right' level of automation is a relative notion, functions that would better remain in human hands (for now) include overseeing traffic management and building and fixing the technical tools for it. This would help with ensuring liability for operations, but also informing passengers in an ad hoc and private way.

Conclusion

It is vital to recognize both the tremendous potential of automation and digitalisation to expand public transport capacity as much as their limits.

At the moment, there is both a lack and need for business models to support in key contexts, such as rural areas or/and at night, where density is low and service must be provided on-demand rather than in a routine manner. This was one of the conclusions of the pilot conducted in the city of Varberg in Sweden, in the framework of the EU-funded PAV project.

Bus driver in action WE-TRANSFORM



Most importantly, while challenging, we must put citizens at the forefront of decision-making, that is, if we truly want to move forward and along with the times. Workers and passengers must be involved in designing automated and digital services; without their input, we are setting ourselves up for failure, failing to capitalise on the efforts. But this will take time.

Humans are not machines, and thus, they take time to adapt. Indeed, changing consumer behaviour is (almost) always a significant, (yet achievable!) challenge.

As Eric Callé, Innovation and industrialization Director at Keolis, said: 'User needs evolve with innovations, but users need a transition period to adapt their habits or routine to newly available services. They need time to learn how to use innovations.'

WE-TRANSFORM Workshop #3 in Riga

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