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APPLYING TECHNICAL SOLUTIONS AND OMNICHANNEL APPROACH TO MANAGING THE INFORMATION IN TRANSPORT

Summary: When considering information management in transport, one may try to take several perspectives; omnichannel approach seem to be the most interesting one. The role information management plays in enhancing transport capabilities is considered crucial. What is more, contemporary technology development allows to build coherent network which would collect, store and perform preliminary analysis of the information acquired. Thus, one might receive the model of passing the information that would address best the needs expressed by contemporary citizen. The purpose of the hereby article is to present how to adapt omnichannel approach towards information management so that to boost its effectiveness. The research is theoretical, thus allowing the area for discussion of the proposed model, nevertheless, its character limits the possibility to verify it in practice; therefore it should be highlighted its findings ought to be followed with practical verification of the idea.

Keywords: omnichannel, managing information in transport, ICT network.

JEL Classification: R4, O18.

Introduction

Managing information may be perceived crucial, due to all the implications it may bring, both positive, such as smooth, fluently performed activities, limited time required to alert people or to help them move from a place to a place, or negative, such as inadequate reaction to the problem, due to lack of information, evoked panic or standard of transport services lower than could be delivered when supported with appropriate information management. Therefore, the idea how to manage the information, perceived from the perspective of both the tools

used to gather and process it and from the perspective of the approach towards its management, providing and analysing, appears to be an important issue worth consideration.

There are various approaches towards information management. In some cases it is considered prudent not to reveal too much information or too many details. In other perspectives, all communication channel participants are considered important or almost equal in participating in the information flow, that is, it is considered positive when information recipient may follow the information flow. The former may prove useful in some situations with limited trust towards communication participants; the latter may provide better working conditions in transport services. What is more, the latter approach compliments well with the omnichannel approach, used in retail. Therefore, it seems prudent to try to analyse information management from the perspective of this approach so as to see how it may improve information management in transport and boost its effectiveness.

Such approach is consistent with contemporary range of tools that may be used to collect, send, and analyse information on transport infrastructure, participants, emergencies, and standards traffic monitoring, both from the perspective of business, transport organizers and providers, as well as traffic participants. The present article aims to analyse such approach in information management in transport from the perspective of transport organizers and participants in a city; somewhat borrowing logistics approach towards traffic management may offer a possibility to better use owned resources and boost information management service quality, and in consequence – enhance transport service quality.

The article presents literature review of some of the solutions analysed for the purpose of the article thesis, followed by short description of the research methodology, and concluded by the research findings. It is followed by the discussion areas emerging from the findings and the final conclusion of the article.

1. Literature review

When considering adopting retail approach towards the information management in transport, one might consider the advantages of omnichannel approach. Omnichannel is a multichannel approach to sales that seeks to provide customers with a seamless shopping experience, whether they're shopping online from a desktop or mobile device, by telephone, or in a brick-and-mortar

store [Rouse, Goulart, Sparapani, 2018]. It is claimed "modern omni channel shopper has forever changed retail (…) Empowered and well-informed, omni channel shoppers (…) expect a seamless customer experience (…) that offers the advantages of both online and in-store shopping" [Murfield et al., 2017, p. 263].

Such approach, with emphasis on using both online of offline channels of constant communication and information flow, may be and is adapted into information management in transport. Such process has already taken place in private communication flow. Messaging, voice mails, and e-mail have all contributed to an explosive growth in data enabling enhanced communication between human beings, between humans and machines and from machine to machine [Smedley, 2017]. Such tools of communication have elaborated into creating new network of information sources and channels. That in turn allowed to create collaborative network management, real time location systems or even demand responsive transport.

What needs to be highlighted, though, is for the group or company to be relationship oriented. Such factor boosts the flow integration; the investigation of Durugbo [2014] has showed that collaborative networked organizations flow integration could be enhanced when the companies prioritize schemes for systematized templates, procedural prompts, implementation checklists, confidence building, issuance policies, and concern separation. In case of transport management, the stakeholders constitute the group much wider and more numerous than the company workers; nonetheless, it seems the feeling of being listened to and being able to follow procedures is common both among the company employees and transport stakeholders.

Generally speaking, as it is observed, factors such as growing attention for service sector, increasing well-being level, more qualified and well informed stakeholders and consumer safeguard, have strongly influenced organizations management system [Renzi et al., 2009]. Therefore, it seems that this need should be emphasized in information management; the process should not only be smooth for safety reasons, but also, to provide the feeling of belongingness among the network users.

When discussing the transport systems, in case of transport information management one needs to mention the internationality of RTISs, that are road transport information systems. As it is stated, their underlying digitized road networks, which were initially restricted for use in national operations only, have been enhanced and extended for use in international operations. Today operators can choose from a wide range of strategic, tactical, and operational RTISs, allowing for the effective planning of international distribution [Eibl, 1993].

Such networks may obviously be enhanced with wireless technology tools, like RFID, RF-based sensors, sensor networks and real-time location system (RTLS). It is vital that these large amounts of data are linked to identifiable entities for later retrieval and analysis [Senneset et al., 2010]. Those in turn need to be complemented with IT and ICT tools, as they would influence the functioning of the supply chain, boosting its effectiveness. It is highlighted, that opportunities with long-term approaches also benefit the field of information and communication technologies (ICTs) and their applications for transport, intelligent transport systems and services (ITS). While ICTs are currently gaining an increasingly important role in transport systems, the context of transport policies is shifting from the traditional, very path-dependent design of road, railway or waterway infrastructures towards the development of complex technological systems [Auvinen, Tuominen, Ahlgvist, 2012].

It is shown that the ICT-based systems depend on new intelligent technologies and applications, such as traveler information and traffic management services, navigation and autonomous vehicle systems [Auvinen, Tuominen, Ahlqvist, 2012]. What is more, the use of ICT tools may boost its use; according to the research of Leiren and Skollerud [2016], the more extensive the service is, the more popular it is – even to the extent that leisure clubs adapt their start and end times to the public transport routes. Moreover, the evidence suggests that door-to-door transport is crucial for the ability of many people of older age to travel [Leiren, Skollerud, 2016].

2. Research methodology

The article presents the model of information management using available tools and technologies as well as the exploratory approach focusing on engaging all the process participants into its flaw. As the article is planned as the first step of the model building process, it focuses on answering the question, how information management process could be enhanced so that it contributes into creating more effective transport management in general.

As there are various methods of approaching the issue of managing the information, it appears to be a good idea to verify the approach that seems most promising when used in its first environment, that is, the retail. Such approach is called omnichannel, and it seems appropriate to answer to the demands of information management process in transport, as it engages all the communication participants. What is more, the requirements of the approach, such as common

cooperation among the process participants, could be relatively easily met, at least to some degree, among transport users and transport operators, thus allowing to boost traffic smoothness with better information management.

The following steps of the research should include comparative analyzing specific environments of transport organizations where such approach to the information management would be observed and tested. That in turn would provide the material for further research, thus allowing to pick the tools and approaches best functioning when managing information in transport.

3. Research findings

As the omnichannel approach could be implemented into various types of transport, wherever information management is crucial for the transport operations to be successful, it seems prudent to present, how such approach changes the information process flow in public transport organized for the groups with defined needs, such as the elderly, and how it works or could work in public transport or more widely, in business.

3.1. Information management in public transport

Information management seems extremally important in the transport service, where numerous people use the same vehicle at the same time, needing to adjust their plans for the timetable. In such conditions, offering the chance to participate in the process of boosting the service level, due to the smooth information flow, seem priceless. There are various types of information needed to be analyzed, process and managed, like: vehicle punctuality, number of people using particular line, most popular methods of payment, most commonly used tickets, etc. In such cases tools used to gather information and to process it becomes one at some level. One of the examples of that cases is electronic public transport ticket in the form of a card. It was predicted as early as in 1994, and currently it appears to be the most often chosen solution. Plastic cards, bearing passenger's data and cooperating with other parts of the system, in order to gather transport data, are very popular. Thus, they can contain information and/or value. The information may be read optically by infra-red readers (as is the BT phonecard, for instance) [Clark, 1994]. The cards offer the transport organizers the opportunity to collect more data much faster and more precisely, but

at the same time, they offer the transport user, a passenger, more space in the decisive process: which ticket to use, what information to pass (if there are set the possibilities to participate in data storing via registering both entering and leaving the vehicle, thus allowing to determine the parts of the line which is the most commonly used, the most crowded, etc.). Such approach offers mutual profits, for a passenger, for transport provider and organizer, but also, for the community as a whole, if the information gathered is not only the one referring closely to the transport itself, but to its effects, both positive and negative. One of such cases is the verified role of information in reducing transport-related emissions. Traveler information offers many benefits to the user and could be influential in affecting travel behavior change [Waygood, Avineri, Lyons, 2012]. Thus, the approach offering the passenger the possibility to participate in the information flow process and influencing the decision making process, creates the possibility to change not only the information management, but also, the standards of behavior conducted by all the process participants.

3.2. Information management in transport organized for the elders

Information management seems extremally important in the transport organized for the groups with specified requirements, such as mothers with the little children (needing extra space or more regular offer), or the elderly. Metz [2017, p. 208] observed: "Improvements in digital technology, increased automation and the sharing economy are all promised changes in transport provision over the next few years. (…) There are obvious advantages that technology can bring to improve tickets on public transport with smartcards which will help older people. Trip planning can be facilitated with better more bespoke travel information and improved satnav and real-time information. Mobility scooters, electronic bikes and better inclusive designed cars and buses all help the offering to older people to maintain their mobility. Internet-based platforms facilitate collective transport offerings and can facilitate community transport and transport networks which help older people stay mobile".

In such environment, information management offering the possibility to influence various stages of the process bring new chances for the group. It becomes much easier to inform the transport organizer where the transport is needed more often, which vehicle is to be changed, who from among the drivers is helpful, who is rude, what time of the vehicle departure is too late or too early, which is unneeded as nobody uses it, etc. At the same time, the chance for the

group to participate in the decision process provide the transport organizer with the opportunity to collect more detailed information on the transport process and the unique chance to make it much more flexible and as a result, more often chosen over other transport possibilities. That, in the world of crowded streets and ageing society, becomes extremally valuable.

3.3. Information management in transport provided and used by the entrepreneurs

When considering omnichannel approach in business, one might associate it automation with bulk processes and with such data management, as invoice transfers. It is argued, though, that IT and ICT technologies might offer new solutions to the business, such as purchasing services provided by international actors, as well as to the situation, where online shop might mean both electronic location and brick and mortar selling online [Inkinen, Tapaninen, Pulli, 2009].

Such approach is followed by the effort to use omni approach towards supply chain operations, believing it to be a key element, enabling transport and storage costs reduction as well as higher customer satisfaction. That might be also enhanced when supported by geographical information system technology, used to manage such data, as warehouse location, choice of the vehicle routes, etc. [Caputo, Pelagagge, Scacchia, 2003]. Such use, especially when joined with the manner of allowing the customer participate in the decision process, but also, providing them with the possibility to monitor the path of the ordered parcel, thus providing them with the information needed to follow the process and at the same time, offering the possibility to deliver the parcel not on the previously specified location (where there might be nobody home at the time) but and the on-the-spot pointed place might build the type of customer relations that have never been possible to reach before.

The requirement for greater speed and flexibility is highly dependent on appropriate information management, as it offers not only smoother, faster operation and better customer service, but it also promises lower staff requirements due to automation. Invoicing, mileage calculation, booking, data despatch, integrating systems – all those might be performed with no, or limited, human interference [Peel, 1995]: that in turn promises savings and more standardized level of customer service, allowing the staff to work on personalizing contact with the customer instead of performing repetitive operations.

Such practice may in turn boost operations quality improvement experienced both by customers and employees; the research of Popovič and Habjan [2012] proved that improved transport operations, namely transport service planning, vehicle routing, and transport control, result in improved customer service, enhanced transport asset utilization, reduced transport costs and time, and in increased satisfaction of employees working within the transport.

Those are but a scratch of wide range of possibilities information management based on omnichannel and on ICT tools offer. Obviously, there are the areas a company or transport organizer might use better or worse, but the capabilities of such approach are clearly visible.

4. Discussion

Proving the relevance of the abovementioned arguments is somewhat difficult; on the one hand, contemporary world make us all so used to the possibilities of ICT tools and so accustomed to be taken into consideration as stakeholders or customers it seems hard to believe another approach would be even taken into consideration. On the other hand, fast-changing technical solutions demand constant analysis and deciding, which of the currently offered solutions would be best to address to the needs expressed be the stakeholders at the given time.

Moreover, what feels most important to discuss further, is the effect ICT tools and omnichannel approach would have on people in general. Several questions appear, as whether it is always a good idea to include all the process participants into the management flow, where is, if it exists, the border behind which the information ought to be protected; how modern technology affects people unable to update every new solution into their professional lives so that to use it effectively and not expose themselves into digital danger of the system abusing the being. Finally, if there exists the moment, the investment costs on constantly new solutions would overcome the financial, but also social costs of using them. It is said information analysis helps process performance improvement [Renzi et al., 2009], but the question is: Are we prepared for that? In all aspects, not only financial, but also social one?

Conclusions

The omnichannel approach seems to be the best answer on what perspective to choose when enhancing the process effectiveness in information management in transport is concerned. The possibilities it offers, especially when lined with ICT tools, are numerous: it changes the stakeholder perspective, allowing them to take part in the transport process and thus making them feel responsible for it, if only partly. Moreover, it facilitates the lives of the social groups with determined requirements as well as offers more flexible and less mistake-prone system with clearer and easier to trace management steps.

However, such approach requires also further consideration on its economical and social impact and on the safety requirements that need to be adopted if it is to be profitable for both organizations and people.

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ZASTOSOWANIE ROZWIĄZAŃ TECHNICZNYCH WRAZ Z PODEJŚCIEM OMNICHANNEL DO ZARZĄDZANIA INFORMACJĄ W TRANSPORCIE

Streszczenie: Rozważając kwestię zarządzania informacją w transporcie, warto zastanowić się nad koncepcją omnichannel. Rola, jaką zarządzanie informacją odgrywa w zwiększaniu możliwości transportowych, uznawana jest za kluczową. Co więcej, rozwój współczesnej technologii pozwala na stworzenie koherentnej sieci zbierającej, przechowującej i dokonującej wstępnej analizy pozyskanych danych. Tym samym można stworzyć model przekazywania informacji, odpowiadający potrzebom współczesnego odbiorcy. Celem niniejszego artykułu jest zaprezentowanie, w jaki sposób można zaadaptować podejście omnichannel do zarządzania informacją, tak aby zwiększyć jej efektywność. Rozważania mają charakter teoretyczny, pozwalając na dyskusję nad analizowanym modelem; niemniej jednak należy podkreślić, że przedstawione informacje powinny przejść proces weryfikacji w praktyce.

Słowa kluczowe: omnichannel, zarządzanie informacją w transporcie, sieć ICT.