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INNOVATION MANAGEMENT IN THIRD-PARTY LOGISTICS

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Purpose: The main purpose of the following article is to present the implementation process of interactive platform to exchange the information about innovations in the chosen international third-party company. The main identified problem is the problem connected with insufficient knowledge about innovation possible to use and even innovation already in use in the different logistics platforms when the need of its usage appears.
Design/methodology/approach: Identified problem was connected with the not enough knowledge of current innovation in use or in consideration. The different platforms in the different regions or countries were not aware about technological solutions used in the whole organization and waste time and human power for searching the suitable solutions and solutions suppliers for the regional activity. Needs in this case were identified among the managers. The 60 managers from Poland, Czech Republic and Slovakia were asked about the preferred user requirements of such a tool.
Findings: The proposed platform allowed implementation in the 3PL company structure the knowledge about innovation flow and make such information highly available. Currently, the innovations in the filed of 3PL activity were divided into main categories as follows: picking, packing, transportation, internal transportation, sustainable solutions, quality control, reverse logistics and claims, warehousing and Big Data analysis. A presented case study was implemented in the activity of an international 3PL company which gain the awareness of innovations which are used in the different regions or which were considered to use.
Originality/value: In the following research paper were presented the knowledge about innovation sharing platform for logistics operator to facilitate their activity connected with innovations implementation and as a result to provide the logistics services in the more efficient way.

Keywords: 3PL, innovation, logistics service provider, knowledge sharing platform.

Category of the paper: Research paper.

1. Introduction

Innovation exhibits the direction and progress of the regional and world economic development (Gao et al., 2017). Innovation is critical to the success of many firms, including providers of logistics services (Flint et al., 2005) and could be described as implementation of new or improvement of existing goods and processes (Juchniewicz, 2015) or as a process that goes from problem identification to development to adaption and then, finally, to diffusion of the product or process (Heaslip et al., 2018).

Being innovative is not just a challenge for the companies it is a must (Barczak et al., 2019) and the new technologies are creating the strategic opportunities for the organizations to build (Bhandari, 2014). The innovation management literature can be characterized not only in terms of its huge volume but also by an evolving understanding and sophistication in the conceptual and practical models describing how innovation takes place (Heaslip et al., 2018). However in 2005 the innovation in logistics was summarized by Flint et al. in a few words: "logistics research largely ignored the concept of innovation" (Flint et al., 2005). It means that the innovation area was a poor consideration area, but for now the trend changed and we can be witnesses of more and more research papers connected with logistics and innovation. Currently still there is not a lot of research papers in the logistics field of study connected with innovations. Gopfert and Wellbrock examined the top nine logistics journals and make the conclusion that the only from 1,15% to 8,10% research papers in the years 2000-2013 were related to innovations (Gopfert, Wellbrock, 2016). Other researches show that about 32% of research papers connected with innovations are based on case studies (Gao et al., 2017). The acceleration of the technological route in the form of digitization, Internetization, virtualization, and automation has resulted in the recalibration of economies and societies during the last century (Kosińska-Morawska et al., 2022). The current trends in research are usually connected with e-commerce, e-tailing or fresh products distribution (Gu et al., 2018) or the solutions supported the multi-, cross- and omnichannel distribution (Saskia et al., 2016).

In the following paper will be considered the platform to exchange the knowledge about innovations thought the international logistics operator based on case study. Case study was elaborated based on implementation of such a platform in the outsourcing company. Outsourcing, an operations strategy that influences the performance of a supply chain, has become an important component of global operations management (Gunasekaran et al., 2015). Additionally the following hypothesis will be tested: cloud-based solution provide the proper environment for innovation knowledge sharing inside the logistics operator structures.

2. Literature review

While innovativeness helps an organisation to develop new products and services and effectively use technology, the way partnerships and innovativeness are managed in an organisation heavily depends on how deeply knowledge management practices are embedded within the organisation and how easily this knowledge can be transferred (Tajdini, Tajeddini, 2018). Main drivers of logistics innovation are as follow: governmental support, environmental uncertainty, organization of labour, competition, outsourcing pressure, customer demand, capital scarcity, knowledge, technology, relationship network, financial resources, management resources and organizational encouragement (Sumantri, 2020). The main task of logistical support of innovation solutions system should become: optimization of economic flows, rationalization of operations and building and expanding innovation potential (Smerichevskyi et al., 2020). The development of logistics technologies has become possible due to the active introduction of information technologies that allow processing large amounts of data and open up prospects for the use of information and analytical centers of logistics providers (Gabdullina, Tolysbaev, 2020).

Representation of technological innovations is usually associated with Smart Logistics (Kosińska-Morawska et al., 2022) or Logistics 4.0 concept. The Logistics 4.0 concept implementation advantages are: savings in human work, high standardisation of linking logistic functions to information pieces and the use of equipping logistic enterprises with the newest technology. The disadvantages are: high investment costs and the IT supply network possession requirement (Szymańska et al., 2017). Logistics 4.0 should also take into account technological applications connected with resource planning, warehouse management, transportation management, intelligent transportation systems and information security (Cimini et al., 2019). Contemporary we also be aware of the new conception connected with Industry 5.0. The concept of Industry 5.0, first introduced in 2015 with an emphasis on the human dimension of industry, refers to the collaboration between people and intelligent manufacturing systems, and thus goes beyond the production of goods and the offering of services for profit (Kosińska-Morawska et al., 2022). Logistics 5.0 could be in this case also derivative of next industry revolution and could take the biggest interest on human factors in logistics technology and flows. Human factors are defined as the "scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance (Cimini et al., 2019).

Some authors proposed grouping the logistics innovations into two types: Type-1 innovation: technical/technological (stages include data acquisition, information management, warehousing and transportation) and Type-2 Innovation: administrative and nontechnological (activities include; changes in structures, business processes, customer and supplier

relationships management and knowledge management issues) (Sundarakani, 2016). On the other hand the latest new technologies used in logistics could be sorted into three main areas: automatic identification technologies, communication technologies and information technologies (Bhandari, 2014). In business services we can witness the five different types of innovative functions: technological, organizational, strategic, commercial and operational (Gallego et al., 2013) or we can grouped it at technological, conceptual and strategic areas (Zhang et al., 2008).

Inventions in technology, process or market that simultaneously create economic and societal value. Societal value can be differentiated in protecting the environment, ensuring economic growth and advancing social well-being (Orellano et al., 2021). Saskia et al. shows the few areas of innovation in contemporary food logistics as follows (Saskia et al., 2016):

- Send a food brand without supermarket intermediary.
- Use of chilled lockers.
- Direct selling wholesaler-consumer.
- Fresh-produce Drive associated with a standard Drive.
- More products than many POS.
- Corner shop culture combined with ITC.

Another prospective technologies could be grouped according to Cichosz (2018) which was shown at table 1.

Table 1.
Technologial trends in logistics

Time of relevant	Chosen solutions
< 5 years	• Robotics & Automation • Internet of Things • Cloud Logistics • Big Data Analytics • Augmented Reality • Low-Cost Sensor Solutions
> 5 years	• Self-Driving Vehicles • Artificial Intelligence • 3D Printing • Unmanned Aerial Vehicles • Blockchain • Next-Generation Wireless • Bionic Enhancement • Virtual Reality & Digital Twins

Source: (Cichosz, 2018).

Mass customization is also added to mentioned technologies as one of concepts referred to innovation in logistics (Liu et al., 2015). Barczak et al. specified the following new technologies in logistics: cloud computing, the internet of things, three-dimensional printing (3D printing), artificial intelligence, big data analytics, blockchain, automation, robotics, drones, machine learning, augmented reality, self-propelled vehicles, and digital Platforms. (Barczak et al., 2019).

Today we have widespread internet access in most countries, 76% in Europe, which makes it possible to get in contact with each other easily (Saskia et al., 2016) which makes technologies like Internet of Things (IoT), cloud technologies, cyber physical systems has been recognized as the main drivers of traditional logistics transformation into smart logistics (Cimini et al., 2019). Since 2018, Blockchain is also considered a breakthrough innovation in the T&L sector. The following places were taken by Artificial Intelligence, robotics, independent vehicles and drones (Klein et al., 2022) and there is also visible a huge impact of innovation on reverse logistics (for example e-waste management (Zhang et al., 2010)).

Yan et al. propose a network-based typology of supplier innovation value, which differentiates suppliers not only by levels but also types of innovation value to a buying company (Yan et al., 2017) and in this methodology a important role is playing by ICT (information and communication technologies). ICT technologies are adopted for capillary tracking of displacements with localization technologies, retrieving and providing data and information, developing user-friendly technologies, and smart collecting and elaboration of information through IoT and BigData tools (Ranieri et al., 2018). It is important issued to include both quantitative and qualitative data during consideration about ICT tools (Keller et al., 2015). Information, communication and automation technologies has substantially increased speed of identification, data gathering, processing, analysis and transmission, with high level of accuracy and reliability. Technology is a means to enhance business competitiveness and performance (Bhandari, 2014).

Next important areas of innovation in logistics are digital technologies. Digital innovations and digital technologies stimulate mobility in terms of access to information and its analysis (Barczak et al., 2019). Digitalization is a reflection of an object or analog activity in binary form (Cichosz, 2018) and has been shown to be a powerful way to reduce the cross-border logistics friction (Lee, Shen, 2020). Digital personel management is also state as a future solution for supporting logistics activities (Barykin et al., 2021). With the active use of digital technologies in the nodes of logistics networks starting 5-7 years ago, their implementation was carried out on the principle of replacing the people of operators on information flows (Shmatko et al., 2021) and one of the most trendy solution connected with digitalization is Digital Twin. Digital Twin usually includes: real space, virtual space and the spreading of data/information flow between real and virtual space (Marcucci et al., 2020). Digital Twins could be supported by foresight support systems to predict the future information. Foresight support systems plays an important role in the modern supply chains (Keller et al., 2015). The integration of various technologies is referred to as digitalization, a superordinate concept. Although technologies are a necessary pre-condition for digitalization, they do not have to be digital (Marhauer, Hofman, 2019).

Looking at the whole supply chain, improving the internal logistics performance, exploiting better coordination and management of warehouses and transport, can also bring benefits to other departments of the enterprise. Logistics operator working in the shop floor can support

sales processes, contributing to the improvement of the customer service level of the enterprise, with responsive information exchange about material and production management (Cimini et al., 2019). Supply chain innovation is vital across all product and service categories for the provision of new services (Wong, Ngai, 2019) and generate a positive impact on risk management capabilities (Kwak et al., 2018).

More and more activities in enterprises are dominated by innovative business models (Cichosz, 2018). The, One way to prevent lock-in effects is through an effective regional innovation system (RIS) that incorporates external and unorthodox knowledge into the region's and companies' learning processes (Keller et al., 2015). Learning process is more and more considered in business models. Usually with innovation in logistics there are associated the logistics knowledge creation business models (Grawe et al., 2014), but there is also a model based on voice-of-customer which is state as one of the most important innovation models in logistics (Su et al., 2011). Voice of customer based strictly on value creation. Innovations in the case of value creation focus on servitisation processes, global value chain and open innovation models (Gallego et al., 2013).

3. Research methodology

The main purpose of the following article is to present the implementation process of interactive platform to exchange the information about innovations in the chosen international third-party company. The main identified problem is the problem connected with insufficient knowledge about innovation possible to use and even innovation already in use in the different logistics platforms when the need of its usage appears. Many researchers give attention to the fact that organizational learning could be supported in the efficient way by IT technologies (Ardito et al., 2018). In the proposed solution a similar ideology was used – in research paper is the proposition of IT platform based on cloud technology which provides the current information about innovations used or considered by company. A similar concept was presented by Keller et al. – they presented the platform for application based on foresight supporting tools (Keller et al., 2015) in this case the platform will be aimed to sharing the knowledge about innovations. The process of platform implementation is shown at figure 1.

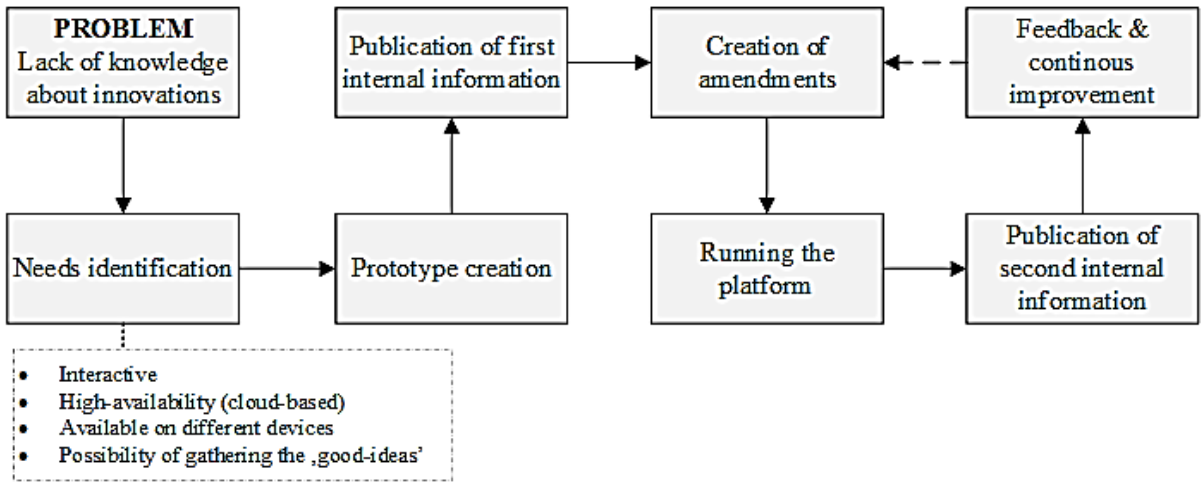

Figure 1. Process of platform implementation.

Source: own elaboration.

Identified problem was connected with the not enough knowledge of current innovation in use or in consideration. The different platforms in the different regions or countries were not aware about technological solutions used in the whole organization and waste time and human power for searching the suitable solutions and solutions suppliers for the regional activity. Needs in this case were identified among the managers. The 60 managers from Poland, Czech Republic and Slovakia were asked about the preferred user requirements of such a tool. Information platforms should meet the basic requirements connected with quality standards, the structure of information, and amount of information (Keller et al., 2015), but according to mentioned analysis among managers, it should also have some additional features. After this step the prototype were elaborated – a prototype was the tool based on a cloud platform which provide a wide range of possibilities connected with its availability and active collaboration with the user in the perspective of continuous improvements. Next step is sharing the prototype platform to the wide range of potential users with asking for improvement propositions. Last phase is connected with implementation and gathering the ideas of improvements in the continuous way.

4. Results

During the process of preparing the prototype of platform for sharing the knowledge about the innovation the 60 managers from Poland, Czech Republik and Slovakia were asked about their users preferences. To gather the preferences the e-survey was used and the most common answers were shown on figure 2. Survey allows to multiple answers and chose the few prefered platform functions by the managers.

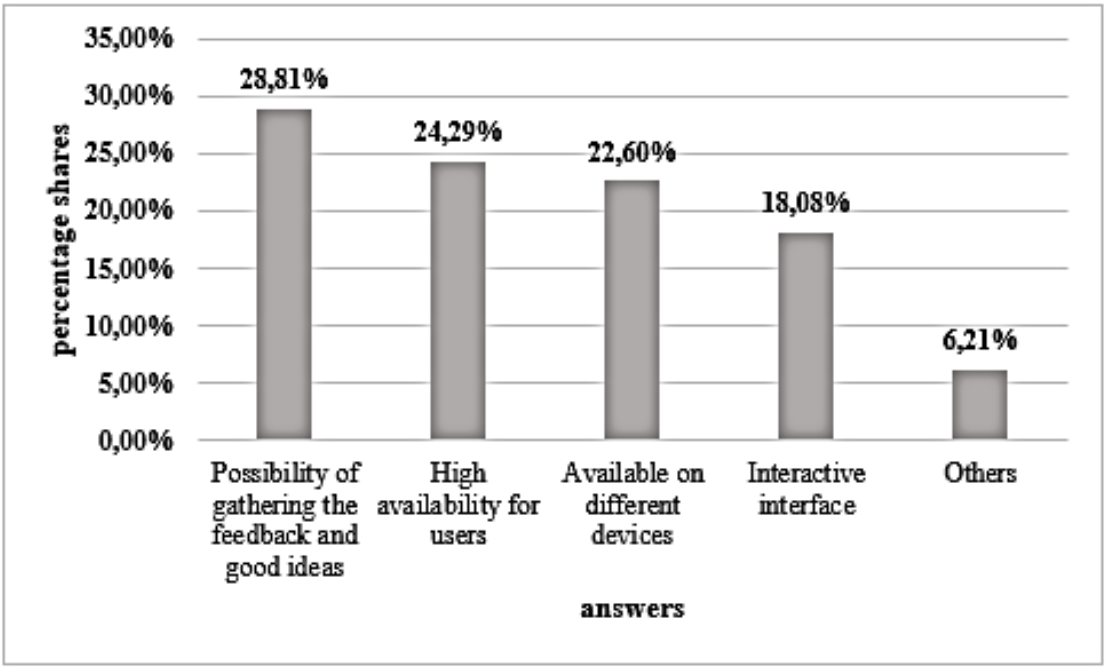

Figure 2. Preferred features of the proposed platform.

Source: own elaboration.

According to the survey results the most wanted features of the platform is the possibility of gathering the feedback and good ideas from the users. So, the platform will be additionally supported by the system of feedback which will be still available on the tool. Next two features: high availability for users and available on different devices (like phones, computers or tablets) create the necessity of adopting the tool into current IT architecture and also it should be cloud-based to provide the high availability and integration of information. Interactive interface was provided by usage of nowadays solutions connected with the intranet websites. The prototype was created to support the workflow of information shown at figure 3.

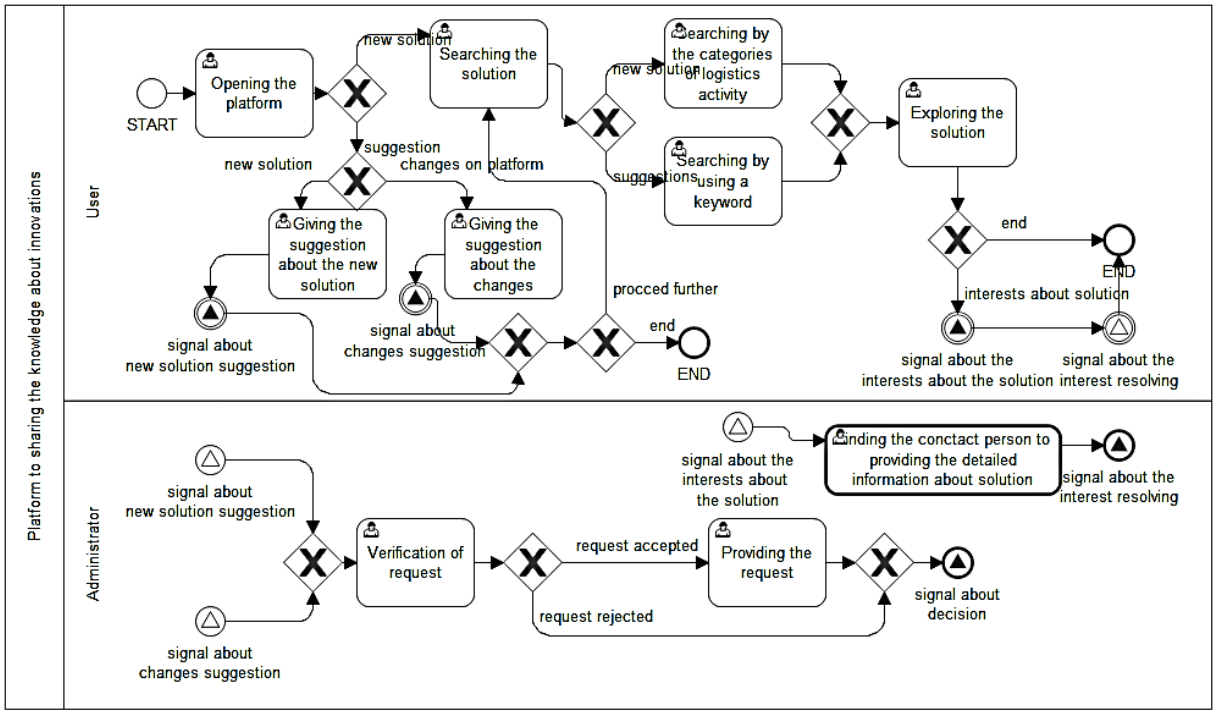

Figure 3. Workflow of platform.

Source: own elaboration.

After preparing the prototype, the beta version of the platform was shared into the main communication channel. In this step, within two weeks, the 34 suggestions of modification were received, where the 28 suggestions were accepted and implemented into the platform. After that the final version of the platform was published. From the time of final version publishing to current situation takes 2 months. At this time the additional 8 changes were made according to users suggestions, the 17 new solutions were added and 13 users were linked with the people responsible for implementation of activities in the company. Before the platform such a statistic was unavailable. Additionally the following hypothesis: cloud-based solution provide the proper environment for innovation knowledge sharing inside the logistics operator structures was tested positive.

5. Discussion and conclusions

Logistics service providers continuously adopt new technologies (Marhauer, Hofman, 2019). As a service innovation, it unites the interests of bank, 3PL (third-party logistics) providers, and SMEs and integrates material, finance, and information (Song et al., 2016). Currently we could see two cases in the market. First when the activity of logistic operator is replaced by new technologies and second when the activity of operator is supported by new technologies (Cimini et al., 2019) and we could also see the one-stop logistic provider (1SLP)

which offers services ranging from raw materials handling, manufacturing, assembling, storage, transportation, sales and marketing, customer call centers, and cash flow management (Trappey et al., 2016). Logistics innovation are also strictly connected with organizational knowledge broadening (Ardito et al., 2018).

The proposed platform allowed implementation in the 3PL company structure the knowledge about innovation flow and make such information highly available. Currently, the innovations in the filed of 3PL activity were divided into main categories as follows: picking, packing, transportation, internal transportation, sustainable solutions, quality control, reverse logistics and claims, warehousing and Big Data analysis. A presented case study was implemented in the activity of an international 3PL company which gain the awareness of innovations which are used in the different regions or which were considered to use. The additional category of innovations kind was depended on the phase of implementation and in this case the innovations were tagged as implemented in the more than one activity or warehouse, implemented in one activity or warehouse, in tested phase, prospective and closed. These elements increased the knowledge flow in the 3PL. In practice the most important benefit of such a platform is the easy and fast way of sharing the knowledge about innovations and providing the possibility of continuous growth in this area. The most important research limitations are as follow: implementation of platform in the activity of one company, relatively short time of platform activity and small feedback in the first stage of platform running.

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