

Application Effects of the Monitoring System in the Courier Service Business

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Abstract

The purpose of this article is to present the effects resulting from using the shipment tracking system in the courier branch. The article includes the construction of a tracking system which depending on the business needs may be based on different combinations of technical and technological solutions. Automatic identification systems in conjunction with other technologies creates for the courier industry an innovative solutions that help companies meet the needs of its customers. Usage of a tracking system in case of courier companies becomes a necessary solution that brings certain benefits for both the company and the customer. Companies reduce their costs resulting from reported claims, improve their work, increase the quality of services they provide, therefore gaining a competitive advantage over other companies. Customers through the monitoring system have a continuous access to information about their shipment saving time for the formal steps needed for placing an order which translates into an increase in their satisfaction with the service.

Key words: automatic identification, courier industry, shipments monitoring, system, shipping

1. INTRODUCTION

In the sector of courier services particularly important aspect is to deliver the shipping quickly and safely to the client so that the client was fully satisfied. New features such as automatic sorting in conjunction with automatic identification technologies significantly reduce the time of the delivery which is especially important to the client and also reduce transportation costs those are the most important part of logistics costs. (Kot S. Ślusarczyk B., 2013)

Tracking system allows tracking of shipments in real-time at every step of their way. This enables continuous control over shipments and at the event of any irregularities the monitoring system makes it easy to identify any problem and take appropriate corrective actions. This is possible due to technical and technological solutions that support the monitoring system.

2. THEORETICAL DEFINITION OF THE PROBLEM

Before the discussion about the tracking system and the main effects arising from its use we need to explain the key word monitoring.

Monitoring - this is a tracking of quantitative and qualitative changes of certain values, occurrences. (Sobol E.(ed.), 2002)

In relation to the courier industry monitoring service allows tracking the whole path during the supply using the various technical solutions and technologies.

The tracking also known as Track and Trace is primarily based on automatic identification. It depends on the traceability through the Internet or other services of successive stages of the delivery. This is possible by using marking systems and automatic identification of items at every step of the way by usage of a variety of technologies such as bar codes, RfID or GPS. (Rydzkowski W., 2007) (Dima I. C. Grabara J. Pachura, 2010)

Each automatic tracking system consists of the following components:

"Objects (materials and supplies, finished products - hereinafter referred to as goods or trade items / resources, logistic units, shipments, location of materials / goods / resources, documents and other objects) marked with bar codes or RfID tags;

Specialized equipment; it's mainly: barcode printers, readers (scanners) and recorders or portable terminals. In case of an additional radio technology ADC devices will also include RfID tags with appropriate parameters, transmitters and radio scanners equipped with a barcode reader, mainly EAN.UCC global codes;

Software for tracking purposes must ensure the transmission of information about the place and time of dispatch of shipping, passing through intermediate points and its delivery to the central database." (Szymonik A., 2010)

The monitoring system is primarily based on automatic identification, however for its proper operation it is necessary to use other technologies such as the Internet, EDI and EPC. The following technologies are included in the system.

Barcodes are one of the most popular forms of automatic identification used for the recognition of goods and logistics units. They are a graphical representation of information represented by the bars and the spacing between them. Codes allow encoding information for later quick and error-free reading. They are used to identify products in order to enable automatic reading and entering data into informatics systems using devices called barcode readers. (Matulewski M. Konecka S. Fajfer P. Wojciechowski A., 2008)

By assigning a unique shipping number, each package is quickly and accurately localized practically at every point of the way from the sender, via terminals up to the final recipient. Using barcode readers causes that shipment is scanned and recorded in the computer system of the company and later thanks to wireless connection of the scanning devices with the company's information system the information is send directly during the delivery process so that after a few minutes it is possible to establish the position of shipping.

RFID is a radio frequency identification system. The idea behind it is based on the storage of data on the transceiver devices as tags, after which they are read in an automated radio way by the readers. An RFID system consists essentially of two elements which are:

marker placed on an identified object;

reader whose role is to read the data contained in the tag. (Technologie RFID i EPC, 2014)

RFID tracking system is mainly used for the identification and location of items or bulk cargoes on the entire delivery road. At each scan tag which is placed on the shipping, with usage of the reader, the information about the shipment is being read automatically and using radio waves transmitted to the local network of RFID, then it goes to the Central Monitoring System where it is processed and stored. The big advantage of this technology is the ability to scan a group of shipments in a non-contact way. For this purpose at the entrance of cars to the terminal or the sorting gate a RFID reader is placed so that after the car travels through the gate all the items found in the vehicle are automatically scanned and this information is send to the company's system. (Kisielnicki J., 2008)

Nowadays, the Internet, or wide area network, which is based on TCP / IP protocol, is commonly applied in different areas of life, including in the courier industry. (Nowicki A. (ed.), 2006) Using the web or e-mail it is now possible to track shipments, information about where it is now, at what time it left the particular points and who is responsible for its delivery. Internet is also used for data exchange within the company and it is used to communicate with enterprise customers.

EPC - or Electronic Product Code, is a 96-bit identifier of the package containing the goods which can be individual/collective and logistics, stored in the chip of the tag. EPC is also called "radio barcode". This identifier is stored in the electronic version instead of the paper one and electromagnetic waves at high frequencies are used for reading such information. (Technologie RFID i EPC, 2014) In the monitoring system EPC code has the same uses as bar codes that is to identify shipments. In this concept, the standard "paper" barcode has been replaced with an electronic tag, which when scanned with the reader is identified with information about the shipment and this information is placed on the Internet and the access to it is possible thanks to the ONS service.

In order to achieve some certain effects management of the logistic chain the chain of processes itself has to be supported by tools from information technology both in terms of individual elements of the chain (information systems), as well as the exchange of information between them (EDI). EDI or Electronic Data Interchange is the flow of data in electronic form between information systems of contract partners in formats described in international standards with minimal human intervention. The data can be automatically processed by a computer, regardless of what kind of software is used. Documentation in EDI maps the traditional commercial documents which may include: invoices, purchase orders, production schedules, etc. (Kot S. (ed.), 2008) (Electronic Date Interchange, 2014) Thanks to the combination of Electronic Data Interchange with Internet and automatic identification technologies it is possible to have a wireless exchange of documents. Documents such as invoice can be issued on the basis of data from the shipping, which after reading by the scanner are automatically send by EDI to the recipient. Electronic Exchange of Documentation is integral technology that supports tracking system, because with it in an automatic way both the company and the client are kept informed about the status of the order.

GPS, or Global Positioning System is a satellite navigation system, which was created by the U.S. Department of Defense, it covers the entire globe. (Portal geoinformacyjny, 2014) The system allows the location of mobile objects in the world with an accuracy of a few meters. (Gołemska E. (ed.), 2006) In the shipment tracking system GPS is used primarily for tracking (in real time) of vehicle location and the information about it can be displayed in the form of text or graphics. The vehicle carrying the shipping shall determine its position using the on-board receiver and data about the current position is transmitted via satellite links (or in the case of being within range of mobile networks - GSM links) to the traffic control center which is the company. By equipping the vehicle with on-board computer with detectors and motion sensors and its integration with GPS receiver it is also possible to monitor some additional data besides the basic ones. The additional data are: the state of shipping or the temperature inside the vehicle. This allows more precise control over the state of the shipments during transport. (Mendyk E., 2009)

GSM is the most popular standard for mobile telephony. Networks based on this system offer services in the field of voice, data and text message or multimedia message transmission. (Krawczyk S. (ed.), 2011) In the shipment tracking system GSM is mainly used for data transmission from the terminal to the company's information system. Information about shipment goes immediately into the system through wireless communication, so it is possible to systematically track the movement of the shipping. The GSM system can also be used for communication in the GPS system between a moving object and the control center. This is realized by usage of GSM links. When the vehicle moves along the arterial roads

in the range of GSM network. Also thanks to this technology information about location, temperature inside the transport vehicles etc. are immediately transmitted to the company's system. GSM network is also used for communication between the user and the company by calling on the hotline or sending/receiving text messages regarding information about the shipping itself.

As you can see tracking system can be based on different solutions and depends only on the individual needs of the company.

3. EFFECTS OF APPLICATION A SHIPMENT TRACKING SYSTEM IN THE COURIER INDUSTRY

Effects of application a shipment tracking system in the courier industry from the point of view of the company

Reduction of costs: Firms by implementing a system for shipments monitoring have decreased costs associated with compensation fees paid to customers for lost or damaged shipments. The system is allowing the supervision of what is happening at any given time of the delivery, and if a problem occurs it is possible to make an immediate intervention and corrective actions. Through this approach the number of complaints reported by customers was reduced which resulted in decreasing the number of claims and compensations. (Dima I.C. Man M. Vlăduțescu Ș., 2012)

Gaining competitive advantage: Companies wishing to meet the demands of customers in addition to extra services or monitoring capabilities offer newer and newer solutions that improve the whole process of delivery and thereby increase customer satisfaction. The introduction of a monitoring system in companies related to the courier industry helped with extension of the range of provided services and by that distinguishes this industry among the others. This resulted in the acquisition of new customers and thus increased the revenue of the companies.

Increased security of shipments: With the introduction of this system the company gained full control over what happens with the shipping during the delivery. Tracking process allowed full access to the data about the shipment during the following steps: receiving a shipping from a customer, delivery to the terminal, leaving it, providing it to the sorting area where in addition to logistics services sorting items into regions is done and ultimately delivery to the customer. Thanks to modern technologies in the system also additional information such as the date and time of particular steps of the delivery as well as the signature of the person receiving the shipment is visible. In case of any abnormality such as damage or loss of shipping the company can easily locate the place of the event and who is responsible for it and can quickly take the appropriate corrective actions.

Improving the company's work: With the introduction of automatic identification technology which shipping tracking system is based on we can witness a significant acceleration of operations such as data entry into the system or the localization of the shipping. The system allowed the company in addition to proper security of items also the ability to coordinate activities within the company. Access to information about shipments allows employees to efficiently plan the transport routes and its correct delivery.

Eliminate errors: Thanks to monitoring system we can see decreased percentage of undelivered shipments. Through continuous control over the fate of the shipping it is possible to have an immediate

intervention in the event of any irregularities. An important role in the monitoring system also plays an automatic sorting in which human labor is reduced to a minimum so that errors arising therefrom are practically eliminated in hundred percent.

Improving the quality of provided services: With this solution which is the monitoring system the company cares of continuous improvement of the quality of offered services. Through the constant access to information about shipments and statistics about them company can eliminate any arising problems and apply solutions in order to achieve certain and intended goals.

Effects of application a shipment tracking system in the courier industry from the point of view of the client

Increased customer satisfaction: Companies provide a variety of solutions adapted to individual customer needs starting from a simple shipment status check e.g. via the company's website through more advanced methods such as special applications which in addition to the normal tracking also make possible to manage shipments, orders, etc.

Time saving: With the implementation of tracking system companies have significantly reduced the formal steps associated with placing an orders, information about the status of orders, etc.

Meeting the information needs: Firms thanks to the tracking system ensured both themselves and their customers a full access to the data about shipments, what is happening with it and if necessary at any given time can effectively intervene. The data in the monitoring system about the shipment are related to the general process of its delivery from the moment of reception by the courier via terminals and sorting to its delivery. With this solution the customer knows when he can expect a courier and doesn't waste time waiting for him.

4. SUMMARY

Increase in the popularity of e-business has forced companies to use newer and newer and more flexible solutions in the field of shipments. Customers want their shipment to reach in a quick and safe way the destination place which is why more and more companies decide to apply a system for shipments monitoring.

The study shows that the usage of shipping tracking system in the company brings many benefits to both companies in courier services sector as well as to the customers.

Implementation of the system in the researched companies has brought certain effects such as:

Reducing the costs that arise from paid compensation for complaints reported by customers;

Gaining competitive advantage in the market of logistics services through the introduction of innovative solutions shipping tracking system;

Improving the functioning of companies which is done by continuous access to information about shipments and making it possible to efficiently coordinate the activities within enterprises;

Elimination of errors in the shipments delivery making the whole process faster and more efficient.

On the basis of the above benefits the conclusion is that, although the audited companies had to cover extra costs for introduction of the shipments monitoring system it was in fact a profitable choice, because with this solution overall costs has been decreased and the service of shipments has been improved which is beneficial for the development of companies.

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