Telematics and Recent Trends in Automotive Insurance and Other Types of Insurance

Телематика и новији трендови у осигурању од аутоодговорности и другим видовима осигурања

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Сажетак: Брз развој, иновације и комбиновање различитих технологија довели су до формирања нових информационо-телекомуникационих производа. Услуге рачунарства „у облаку“, интернет, преносиви (мобилни) уређаји, телематика итд., само су неки од таквих производа модерне технологије који омогућавају брзу и максимално ефикасну обраду података. Могућност слободног приступа интернету и појевљење технологије одређивања географског положаја довели су до неограничене примене мобилних паметних телефона за потребе телематике. Истовремено, информационо-комуникационе технологије врше одлучујући утицај на унапређење начина на који функционишу друштво и пословне делатности.

У овом раду, аутори анализирају општи значај телематике, њену дефиницију, настанак и предности које она доноси у пословању осигураваача у осигурању од аутоодговорности и одређеним другим врстама осигурања. У раду су коришћени статистички подаци о тржишту телематике, услови пружања осигурања телематике и други извори.

Кључне речи: телематика, информационо-комуникационе технологије, осигурање, осигураник, аутоодговорност.

Abstract: Rapid development, innovations and the blend of different technologies have brought about the development of new IT-communication products. Cloud computing, the Internet of things, mobile devices, telematics etc. are only some of the products of modern technology that provide swift and highly efficient data processing. The possibility of free access to the Internet and cheaper technology for the determination of geographical position contribute to the development of an unlimited number of smartphone applications for use in telematics. Simultaneously, IT communication makes a decisive impact on improving the way in which society and businesses operate.

In this paper, we examine the general significance of telematics, its notion, history and the advantages it brings to insurer operations in the motor third-party liability (MTPL) and a few other insurance types. Statistical data about the telematics market, the conditions for the provision of telematics services and some other resources were used in this paper.

Keywords: telematics, ICT, insurance, insured, MTPL

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Introduction

Ever since the beginning of the 20th century, great scientific discoveries have found their practical usage in science, industry and administration. Each revolutionary technology has, throughout time, been improved by new inventions and materials which can especially be associated with the development of information and communication technologies (ICT). When people began using computers there were punched cards and magnetic tapes and, only a few decades later, transistors and semiconductors became available, which allowed this technology to develop in a new way. A significant improvement in the field of sensor technology was triggered by the discovery of germanium, and afterwards, silicone during the early 60s in the 20th century (Bäumler, Kotzab, 2017, p.133). The production processes and functions in all fields were innovated by using automation, digitalization and relying on IT management and control. The next big step was setting up the very first electronic networks in the late 60s and the early 70s, and the acquisition of the Internet protocol in 1982, which enabled connections among an unlimited number of independent networks throughout the world. It is not necessary to emphasize the importance of the Internet today or its possibilities and significance in satisfying different needs of country and society. Fast development, innovations and combining various technologies have led to the creation of new ICT products. Cloud computing, the Internet of things, mobile phones, and telematics, are just some of the modern technological products which provide fast and highly efficient data processing. According to some estimates, the Internet business market in the European Union (in further text: EU) was worth 700 billion euros or 5% of the GDP in 2013, while the Internet of things is expected to bring a new wave of economic growth of about 330 billion euros by the year 2020 (Bock et. al., 2015, p.4). Apart from that, the industries which are open for free movement of goods, services, finances, people and data are exposed to new ideas, research, technologies, talents and the best procedures from all over the world. Therefore, they can specialize in a specific type of production and achieve great economy, which all contributes to the further efficiency and innovation of domestic industries (Manyika et al., 2016, p.74).

The goal of introducing new technologies into insurance companies is probably best depicted by Mr. Thomas Neumann, chief strategist of Allianz Deutschland Insurance Company, who said that technology is not its own goal, but that the goal should be the better role of the client. Taking this into consideration, one of the most important aims of ICT implementation is directing its usage towards customer satisfaction (Naumann, 2017, p.32). In favor of the insurers' great attention to Information and Communications means is the fact that 71% of users, interviewed around the world, use some type of digital search (comparing prices and ads on social networks) before purchasing insurance, and that 26% got insurance on the Internet or via their mobile phone (PwC, 2014, 4). Given the current world state in which everything is transferring to ICT, while still having 'old-fashioned' clients, Price

Waterhouse Coopers auditing company has divided clients into: traditional, neutral and “digital cousins” (PwC, 2014, p.6). Although new technologies have the potential to increase financial gain by giving the clients new options for obtaining advice and buying insurance products, one question remains. Should the ones, who have insufficient knowledge of how to use new technologies or do not possess the equipment, be potentially excluded (Insurance Europe, 2017b, 3)?

In this paper, we analyze the notion of the term telematics, its origin and the advantages it brings to the insurer’s business and MTPL insurance as well as other types of insurance.

1. Telematics as transmission of data

According to some sources, the first example of telematics usage appeared in the 1970s, 20th century, when the Rockwell International company developed the first on-board recorder “to measure the effects of different devices and driving techniques on heavy truck and fuel economy” (EsseyUK, 2017). In the early 1970s the Ministry of Defense decided to support its navigation system with satellites. From 1978, when the first satellite was launched, to 1993 when the Global Positioning System (in further text: GPS) became fully functional, twenty-four satellites were launched (NASA, 2012). In the early 1980s, when GPS became available for civil usage, telematics was innovated and upgraded with the satellite communication system. The availability of free internet access and cheap GPS technology resulted in the limitless usage of smart (mobile) phones in telematics.

The term telematics comes from the merged parts of the French words TÉLÉcommunications (telecommunication) and inforMATIQUE (Informatics) and it was first used in the report “Computerizing society” for the French president Vallery Giscard d'Estaing on the “advanced ideas about ways to computerize society” during the economic crisis (Nora, S., Minc, A., 1978). The report starts with the computer revolution (putting microcomputers into usage rapidly) so telematics is defined as “the quick connecting of computers and telecommunications” (Nora, Minc, 1978, p.11). Since then, telematics has found its usage in many other industries.

Today, telematics is mostly linked to driving and intelligent transport systems¹, but it is also used in health care², science and, increasingly, in everyday life³. Due to this we can say that telematics is a multidisciplinary field that uses ICT for sending,

¹ European Road Transport Telematics Implementation Coordination Organization-Intelligent Transport Systems & Services Europe – ERTICO-ITS Europe, <http://ertico.com/>

² European health telematics association – EHTEL, <http://www.ehtel.eu>

³ Telematics technology used to operate home appliances, warns about water leaks or electrical short circuits or the dog collar that monitors the dog’s activity, body temperature, heart beats etc. (RSA Insurance Group, 2016) or its usage in trade, banking, long-distance learning, “the construction industry, waste and recycling management” (Mix Telematics, 2016).

receiving and storing information which allow remote informing, control, planning, conducting, and performing of certain actions or achieving some other goals. By using wireless telecommunication networks, the devices send data from one place to another and, therefore, fulfill their goal and create the possibility for making the best decisions based on real-time data. To be more abstract, telematics is connecting computers with wireless telecommunication technologies in order to achieve efficient data transfer via an unlimited number of networks to improve business functions or government services for citizens (Bitpipe, 2017). In short, telematics is the branch of information technology which deals with the long-distance transmission of computerized information (Oxford Dictionary, 2017).

The age of motor third-party liability telematics insurance is considered to have started in January, 1996, when the American insurance company Progressive Auto Insurance filed a request for registering their patent. In their patent they describe the equipment and procedures needed in order to determine the motor third-party liability insurance premium by monitoring the vehicle usage and the driver's conduct directly via the GPS and the mobile phone in the vehicle while changing the premium once a month depending on the changes in the driver's conduct. (Nowotarski, 2004, p. 6).

Road telematics provides the following advantages: safer driving, logistic support for transport service providers, efficient traffic management, and easier planning of new routes. This creates a more efficient infrastructure, has an eco-friendly effect, creating new niche markets and providers of added value services ("Communication from the Commission to the Council and the European Parliament", 1997, 1b). The Commission of European communities has, in the same document, indicated that the goals of its practical use refer to: creating the possibility for information insight before and during the trip and navigation in traffic, traffic management in cities, transporting and control, implementing advanced safety and control systems, organizing commercial logistic chains and collective transport (Communication, 1997, 13-18). However, telematics is used in other fields today as well.

2. Telematics in motor third-party liability insurance

Rapid growth has been noticed when it comes to the use of telematics in car insurance in foreign markets. By the end of year 2014, there were about 4.8 million telematics insurance policies in the European market with the annual growth of 42.4% and, by the end of 2020, the global market of networked devices and services is expected to be worth 170 billion euros (Octotelematics, 2015). Commercial and emergency service vehicles use telematics as a way of operating the fleet of vehicles for companies that provide certain services so it definitely represents another product on the well-developed insurance market.

According to the latest report of the European automotive telematics market, by 2022 this market is expected to grow to 37, 8 billion dollars, with the annual growth of 28% (Market Research & Statistics, 2016).

When comparing to the possibilities they offer, technological solutions are similar in what they can achieve, but the differences in the way data is collected, sent and used is what created different product conceptions of motor third-party liability (MTPL) telematics insurance. Judging from the analyzed terms of insurance, different products of MTPL telematics insurance come from different levels of user interaction and integration. One of the main characteristics of MTPL telematics insurance products, for the insured, is paying for the premium depending on the number of kilometers driven in the measuring period (pay as you drive) or on the driving behavior (pay how you drive). Both types of insurance can be recognized on the market under the term usage based insurance. If the insured cover shorter distances or, on the other hand, drive carefully, without sudden accelerations, braking or other unsafe vehicle maneuvers, they pay a lower insurance premium. In the first case, an insured is awarded for his driving behavior which contributes to a lower risk rate⁴, while, in the other case, an insured is being rewarded for their conscientious and responsible driving behavior⁵. A recent study (Ayuso et al., December 2016) provides count data regression models for rate making using telematics.

We can say that in both products mentioned above is a one-way information system, from the on-board vehicle recorder to the telematics service provider and the insurer. Contrary to the two mentioned products, the third telematics MTPL insurance product gives the insured, apart from collecting the data mentioned, constructive information via mobile phone, an on board computer or a multimedia device in the vehicle, which is used to enhance their driving habits and lower the risk of accident, all this, of course, used diligently by the insured.

A specific example of vehicle telematics usage are the permanently installed telematics devices which enhance the safety and which use particular information to assist while driving. Due to this, more vehicles which have cruise control, vehicle accident alert systems, lane departure warning systems, blind spot information systems and automatic parking are emerging on the market. Other examples of devices using telematics are navigation devices and applications with maps in mobile phones which use satellite GPS. For example, a new concept, the smart phone-based telematics system for usage-based insurance, has been recently introduced and studied in (Vavouranakis et al., 2016.). However, the further development of telematics will probably include a whole lot of other services and advantages in driving.

⁴ The device which measures the drivers' behavior tracks when and where the vehicle is being used.

⁵ The recorder registers information about fast acceleration, deceleration, sudden braking, making sharp turns, etc.

The use of road telematics in the EU reached a new level by adopting the Regulation (“Regulation (EU) 2015/758 of the European Parliament and of the Council”, 2015) concerning type-approval requirements for the development of the eCall in-vehicle system based on the 112 service which obligated the vehicle manufacturers to permanently implement that system into all new-generation cars by March 31st, 2018. In case of a serious car accident detected by either one or a number of sensors and built-in processors, the system should automatically dial the medical emergency service number 112 on the territory of the EU (Regulation, 2015, articles 4 and 5).

MTPL telematics is a type of voluntary insurance because the insured can get MTPL insurance without the use of telematics. This is why it is necessary that the insured makes a contract on using telematics services with its service provider which in fact provides those services to both the insured and the insurer.

By analyzing the terms of insurance that insurers from Great Britain have, it is concluded that they monitor the following data concerning insured drivers: acceleration, braking, turning, driving distances, vehicle location, mileage covered, driving speed, resting time, usage time and type of road. Although it is stated that telematics is used for collecting and processing personal data, in terms of use, it is indicated that the insurer has the right to collect, apart from the personal, all other data, as well (Aviva, 2015, 5; AXA, 2016, 2).

Just how beneficial telematics is for the insured is the fact that, without its implementation, the resting period, the period of not using the vehicle, cannot be determined, and not using the vehicle can affect a certain premium bonus. For example, aviation insurance also grants a premium discount when renewing the policy if any of the aircraft were out of service for at least 30 days during the insurance period. Of course, the insurer can also reduce the number of days after which the insured is entitled to a part of the premium return. However, for the insured to claim the premium return (while obliged to obey other terms of the Clause in question) it is necessary to submit the starting and ending dates for the lay-up period (Aircraft Laying Up Returns Clause, AVN 26A, 4.2.2002, Lloyd’s Aviation Underwriter’s Association). The mandatory notice to the aviation insurer represents a significant difference compared with the MTPL telematics insurance in which the insurer deals with precise data concerning the period the vehicle has not been used, so it is not necessary for the insured to notify anybody. Apart from that, if an accident does occur, the telematics device can help with certain facts about what was happening before and at the time of the accident. In that case (but not in every single one) telematics can help determine that the insured is not responsible for the accident, but in case he is, it can also help the insurer with faster insurance indemnity. Telematics can offer a special type of assistance in case of vehicle theft but also in informing the driver of insufficient pressure in some of the tires or a possible engine failure.

However, taking into consideration certain categories of drivers, telematics in MTPL insurance is a logical step for younger, inexperienced drivers (between the age of 18 and 25), as it is for older drivers with a bad driving record and because of the fact that driving performances of persons older than 26 are very similar, regardless of the gender (Purvis, 2017, p.42). Also, we should bear in mind that the rates of MTPL telematics insurance are just a temporary solution because, in the future, the human factor will lose its leading role in determining the insurance premium due to the introduction of autonomous vehicles (Schmidt-Gallas, et. al., 2017, p.29).

In the field of transportation, telematics enables the management of a fleet of cargo vehicles concerning the maintenance, vehicle tracking and malfunction diagnostics, safety etc. Significant for the field of insurance is the telematics technology implemented in intelligent vehicles for the purpose of exchanging information alerts among the vehicles nearby and between the vehicle and the infrastructure of a particular route. Apart from paying for tolls, this technology helps to avoid dangerous situations in traffic and car accidents because it can send warning signals to the driver upon which they can take action. Technological development is so intense nowadays that the rate at which the intelligent systems in transport appear prevents the overall view, explanation and definition of each of them and their parts (Bäumler, Kotzab, 2017, p.125).

3. Telematics in other types of insurance

Telematics is in the core of ambient computing which reflects the Internet of things. Mobile devices (which could soon be replaced with chips for body implementation, with the insured's consent, of course) can measure different parameters using sensors (number of steps, pulse, body temperature, blood pressure), transfer them via the Internet to a corresponding analysis⁶ center which then comprises reports and recommendations. Telematics can especially be useful in controlling chronic diseases like diabetes or coronary disease. By using data, the insured's health is being monitored and they are given advice on lifestyle and ways to keep healthy. In this way, the risks are lower and medical expenses are controlled (Insurance Europe, 2017a). These devices can easily be adjusted to the insured's needs and can contribute to the creation of a new insurance product which will directly be connected to the lifestyle of the insured (Bobatoo, 2017).

Vehicle alarm devices which protect the owners from car theft by emitting high-volume sound have been used for a long time. However, when the alarm device (or local video surveillance) is connected to home sensors and to the relevant authorities or owners via the Internet or a wireless connection, it reduces the possibility of theft or

⁶ Monitoring, data analysis and giving directions and notices could be done by the insurer, but, in most cases, that function is given to a specialized provider that deals with these services.

vandalism due to the fast flow of information about the trespassing. The same goes in case of contingencies such as fire, leaking pipes, or a natural disaster that occurs regardless of any person's doings or will. In that case, telematics can, if connected to the right sensors and devices in the place, detect changes and send alerts to relevant authorities or possibly activate the fire extinguishers in the same way the owner can turn off an electrical installation or take other actions (close the window left open) by using remote controlling. The possibility of taking action via telematics and ambient computing depends on having sensors and devices of adequate usage and the connection between them. That is why they say that the power of ambient computing (based on telematics) is partly founded on the rule that the value of a network is the square of the number of participants in it (Deloitte Development, 2015, p.42).

Marine and coastal telematics systems bring revolutions, not only in the shipping industry, but in the recreational and commercial fishing industry, as well. These telematics systems use wireless voice and Information communication which enable e-Navigation, vessel tracking, medical assistance, shipping systems control, Internet access and other functions (Weintrit, 2012, p.346). All of the mentioned features improve the voyage safety, shipping and delivering cargo, high sea exploration and exploitation etc. which raises the quality of those risks to a higher level and makes it appealing for insurance. On the other hand, telematics in marine insurance (all-risk and machines, liability and cargo) provides a detailed analysis of the potential threats during voyages, such as: high mileage, the type of voyage⁷, how close the coast is and how close other vessels are, vessel speed (average and dangerous), the number of vessels in ports with the same insurance at a particular time, the number of ports visited, bad fuel quality, new and inexperienced crew etc. This data could also be combined with the data about the vessel profile, accident and damage reports, weather reports from the past etc. (Walls, 2017, 6).

Conclusions

Information and communication technologies play a crucial role in improving the way society and business operate. On the other hand, its intense implementation inevitably leads to a decline of some business functions and resources, which could lead to significant social and economic consequences in society. Its adequate usage enhances the business framework and the service quality of business entities which leads to the introduction of new products and services of added values. This is a technology with great potential in insurance.

In the field of insurance, telematics also represents the technology that has a few advantages for the insurer. Those advantages mostly reflect a higher level of prevention quality, while the great amount of data collected enables a far more precise and, for the

⁷ Telematics can be used to track the whereabouts of the vessel, the amount of time it stayed in a piracy affected area or with maritime traffic density, when the transponder has been turned off etc.

insured, a more beneficial way of charging. Also to be mentioned is the speed rate of collecting data which enables the insurer a faster claim settlement based on reliable and accurate information with no need of proving their credibility in other (classic) ways.

However, the use of telematics also introduces certain threats that could lead to violation of privacy and personal information, copyright infringement and cyber-attacks. That is why telematics insurance obliges the insurer and the telematics service provider to abide by the law and the rules of the fields mentioned.

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Summary

We examine the general significance of telematics, its notion, history and the advantages it brings to insurer operations in the motor third-party liability (MTPL) and a few other insurance types. Statistical data about the telematics market, the conditions for the provision of telematics services and some other resources were used in this paper. We conclude that telematics also represents the technology that has a few advantages for the insurer. Those advantages mostly reflect a higher level of prevention quality, while the great amount of data collected enables a far more precise and, for the insured, a more beneficial way of charging.