FACTORS AFFECTING DIGITAL TRANSFORMATION OF INSURANCE IN THE REPUBLIC OF SERBIA

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Abstract: Implementation of IT innovations in insurance industry enhances actual business models and creates new ones. E-insurance refers to creating and providing insurance and connected financial services through digital solutions. In this paper the impact of IT usage and digitalization on insurance sector in the Republic of Serbia is analysed. The aim of the proposed analysis is to reveal the determinants of the adoption of innovative technological solutions in insurance in the Republic of Serbia. Relying on the TOE framework, three groups of factors influencing the adoption of IT in e-insurance are identified: technological, organizational and environmental. Panel data approach and logistic regression are used to examine the effects of proposed factors on e-insurance adoption. The obtained results indicate that organizational and environmental factors have statistically significant influence on the achieved level of e-insurance adoption, while only the market share of the insurance company positively influences the odds of e-insurance adoption. Therefore, it can be concluded that e-insurance in the Republic of Serbia is the matter of reputation and tendency of insurers to achieve short-term gains and a competitive advantage through innovation.

1. Introduction

Over the past decade, information technology (IT) has triggered the biggest wave of industry transformation. IT implementation in many industries gave rise to redefinition of products, processes and organization, while transforming business models from traditional to digital ones. Considering insurance, the impact of digitalization can be observed in all activities of value chain. The main changes can be noticed in the interaction between insurers and interested stakeholders, especially prospective and actual policyholders improved business process efficiency and a wide range of advanced insurance products.

However, the dynamics and the extent of changes in insurance industry have not followed the course of IT implementation in other industries. The peculiarity of insurance, especially considering data privacy and protection, as well as strict regulatory requirements, impede the digitalization of insurance and IT innovations. Although IT provides an opportunity to transform the value chain and/or change every element of this structure, many insurers, especially in emerging markets, implement the transformation process in order to digitize only certain value chain activities. The specificity of the insurance service emphasizes the significance of sales issues in insurance industry. However, coordination of a large number of different distribution channels - traditional and online, is often lacking, so such innovations do not necessarily lead to fundamental changes in the value chain (Wiesböck et al., 2017). On the other hand, improvement of the underwriting process, as well as the determination of the insurance premium, represent a change that leads to the transformation of the value chain. Automating the decision-making process based on predictive analytics speeds up the claim processing and reduces the costs associated with this activity while reducing the rate of fraudulent claims.

Given the importance of e-business for enterprises in the modern environment, but referring to the specifics of the insurance industry, the impact of the technological revolution on insurance in the Republic of Serbia is analysed in this study. The aim of the proposed analysis is to determine the factors that influence the adoption of e-insurance, and provide the directions for the development of strategies that include the implementation of innovative technological solutions in the business. This study builds on existing literature that is mostly focused on developed insurance markets and, to the best of authors' knowledge, represents the first study attempting to identify the diffusion pattern of IT implementation and factors that are determining it in the insurance sector of the Republic of Serbia. Accordingly, the structure of the paper is as follows: in the second part of the paper the main trends and challenges in adoption of IT in insurance are described, and the achieved degree of adoption of e-insurance in the Republic of Serbia is assessed. The third part describes the research framework used in this study to determine the factors affecting e-insurance adoption in the Republic of Serbia. The obtained results are presented in the fourth part, while the main conclusions are summarized in the fifth part of the paper.
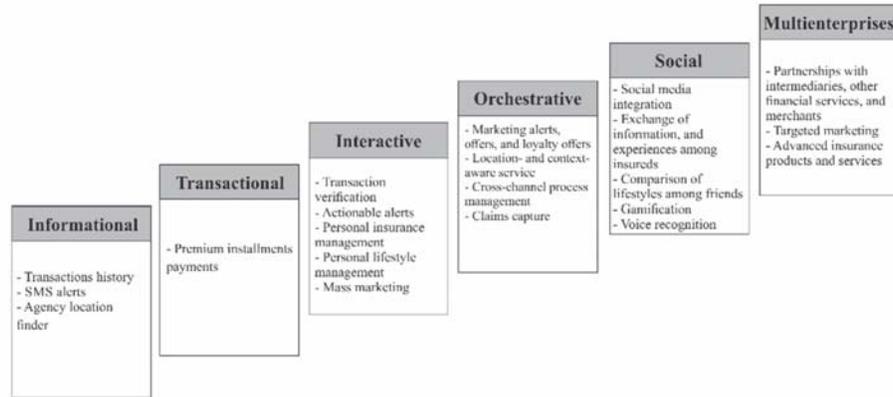
2. Insurance digitalization
– trends and challenges in implementation

The main drivers of digital transformation are enhanced usage of modern information technologies, as well as, advanced usage of traditional technologies with the aim of improving business (Westerman et al., 2014). Digitalization of resources and transformation of activities, products and processes lead to a modified traditional business models and/or completely new ones. E-insurance, as a model of e-business in insurance industry, refers to the implementation and use of insurance and connected financial services through digital solutions (Nicoletti, 2016). The services provided by the e-insurance include informational services, accounting services (monetary services such as online paying for policy), brokerage services, and support services. Informational services are not directly connected to transactions, their basic functions are preparing, processing and disseminating of information (Djellal, 2000). Their role is to provide information about policies, marketing information, premium rates etc. Accounting services are connected with monetary transactions, such as online paying for a motor or travel insurance policy. E-insurance is also strongly connected with insurance accounting system, part of the organizations' information system, for the purpose of preparing accounting information and financial reports. (Foroughi et al., 2012). Brokerage services are providing support for intermediaries in policy services, as well as services for administering policyholders' accounts. Support services are offering a possibility to policyholders administer and maintain their own policies through user portals, web sites or mobile applications. A policyholder can obtain policy copy requests; report claims or have alerts about due premium payments.

As a specific form of organizational transformation caused by the IT implementation (Besson & Rowe, 2012), digital transformation cannot be implemented without an appropriate strategy (Bharadwaj et al., 2013). Insurance companies' digitalization strategy should maintain the balance between efficiency and cost optimization, on one hand, and growth and revenue levers on the other. The main issues that should be considered by the digital transformation strategy are the maturity of implemented IT, influence on the created value, structural changes in organization and costs of IT implementation (Matt et al., 2015). These challenges should not be underestimated since 59% of insurers describe their current status of digital transformation as exploratory and only 47% confirmed that they have a digital transformation strategy that covers the entire value chain (Gasc & Sandquist, 2014). Most of the insurers rank the needs for digitalization according to desirability, technical feasibility and business viability of the innovation and start with innovations that can be deployed in short term. The specificity of the insurance service emphasizes the significance of interaction with policyholders and sales issues in insurance industry. Therefore, the largest share of innovations is implemented in distribution activities, mainly in property and casualty insurance and health insurance (Catlin & Lorenz, 2017).

The wider integration of IT in operational activities of insurance companies that will provide long-term gains in efficiency, requires a secure access to data and implementation of advanced analysis, which represents a significant competitive advantage in the insurance market. However, there are differences in the states of maturity in analytics application between different markets (Anchen & Dave, 2019). Insurance companies in mature markets have already digitalized customer related activities and improved user experience. The availability of large databases with quality data enables insurers in developed markets, especially in US, China and UK, to further improve operating and underwriting efficiency. On average 41% of processes in insurance companies operating in Germany, Switzerland and Austria are already automated. A higher percentage of process automation (47%) was recorded in health insurance. This process will certainly be continued, leading to a reduction in operating costs by an average of 14% (Maas & Bühler, 2015). On the other hand, insurers in developing markets are mostly focused on analytics to support sales and distribution. Available data are usually incomplete, outdated or incorrect, what makes them inappropriate for usage in modelling. Therefore, insurers in developing markets have just started applying data analytics in risk selection and pricing and gaining efficiency mostly in motor and agricultural insurance (Macgregor et al., 2017).

A useful instrument for defining the strategy for implementation of e-insurance can be a scheme of e-business development phases. Assuming that the process of IT implementation in the organization develops according to foreseeable pattern (Gottschalk, 2009), the dynamics of IT adoption can be explained using certain model. Multigenerational view of insurance digitalization, presented in Figure 1, provides a good insight in development phases from communicating information to the customers through enabling transactions, to direct processing of customers' requirements, and providing noninsurance activities. The role of e-insurance in informational stage was providing information such as transaction history and SMS alerts. Transactional stage offers online payments, while interactive stage introduces alerts, personal management and marketing. The most important features offered in orchestrative stage are location and context-aware services, which resulted with the increased number of transactions and increased average transaction value. Social stage is connected with social media integration, exchange of information and capturing customer behaviour and status data. The main benefits of this stage are personalization of services to a specific customer need according to advanced big data analytics models and data obtained from social networks, and moving from mass insurance to personalized insurance. Multi-enterprises stage enabled partnership with intermediaries and other financial services providers, targeted marketing, creating advanced insurance products and services, and promoting services through mobile channels.

Figure 1 - Multigenerational view of insurance digitalization

Source: Nicoletti, B. (2016). Digital insurance: Business innovation in the post-crisis era. Springer.

Taking into account the specific characteristics of the insurance industry, the above framework can be applied to assess the current situation and provide guidelines for formulating an e-insurance development strategy.

Based on the analysis of the content of the websites of 16 insurance companies that have been continuously operating during the observed period 2015-2020 (Table 1), it can be concluded that e-business in the insurance sector in the Republic of Serbia is in the early stages of development. Relying on the multigenerational framework, the achieved adoption of e-insurance can be characterized as interactive, although not all features of this stage are available in the observed insurance companies. All insurance companies have their own websites through which a two-way communication with customers is taking place. However, the complete online sales are offered by 62.5% of insurance companies, while in other insurance companies it has to be done in a traditional way. Through the e-commerce insurance companies in the Republic of Serbia offer standardized non-life insurance policies (travel health insurance, travel insurance and property insurance). Considering claim reporting, 81.25% of the observed insurance companies use modern information technologies in order to digitalize this process. However, almost all insurance companies (93.75%) use social media (Facebook and Instagram) in order to promote their services, while only 8 companies provide personalized services using various applications.

The transition to the next stages to the full integration of e-business implies the integration of all IT activities within the company, as well as better integration of IT with other aspects of business. The extensive use of data warehousing and data mining technologies implies the existence of a fully integrated, enterprise-wide information system. The IT system set up in this way should be managed by an IT

manager, or CIO, whose main task is to connect IT more closely with other functions in the company, while other managers are fully aware of the importance of IT/IS and are fully committed to creating an integrated electronic business environment and adaptive and responsive, customer-oriented organization. Normal progression from less mature to sophisticated phases over time implies the accumulation of knowledge, expertise, skills and experience gained in previous phases, although it is not impossible for companies to evolve faster to more advanced stages.

**Table 1. Online services provided by the insurance companies
in the Republic of Serbia in 2021**

Insurance Company	E-mail	Web site	Social media	App.	Online sale	Claim reporting
Ams osiguranje	*	*	*		*	*
DDOR Novi Sad	*	*	*	*	*	*
Generali osiguranje Srbija	*	*	*	*	*	*
Globos osiguranje	*	*	*		*	*
Grawe osiguranje	*	*	*			*
Milenijum osiguranje	*	*	*		*	*
Sogaz	*	*				
Triglav osiguranje	*	*	*	*	*	*
Uniqa neživotno osiguranje	*	*	*	*	*	*
Uniqa životno osiguranje	*	*	*	*		*
Merkur osiguranje	*	*	*	*		*
Dunav osiguranje	*	*	*	*	*	*
Sava neživotno osiguranje	*	*	*		*	*
Sava životno osiguranje	*	*	*			
OTP osiguranje[*]	*	*				
Wiener Städtische osiguranje	*	*	*	*	*	*
[*] From 2009 to 2019 Societe Generale osiguranje, in September 2019 OTP Group completed acquisition of Societe Generale osiguranje						

Source: Authors' research

Although e-business is rapidly developing and incorporating into existing business models, in developing markets their implementation depends on a large number of factors. In the following part of the paper the most common framework for e-business adoption will be presented and used to assess the factors of e-insurance adoption in the Republic of Serbia.

3. Research methodology framework

3.1. Theoretic background and hypothesis development

Although IT innovations are widely accepted in the financial sector, the insurance industry adopts e-business model more slowly. Full implementation of e-business

requires selecting an appropriate business model, as well as a strategy that will ensure the implementation of IT in business.

Assuming that a business model implies architecture for products, services and information flows, including resources, as well as different entities that have a specific, previously described role in the model and expect potential benefits (Tsalgatidou & Pitoura, 2001), it represents a coherent framework that transforms the characteristics and potentials of e-business through customers and the market into value for the enterprise (Chesbrough & Rosenbloom, 2002). The introduction of an appropriate e-business model is conditioned by a number of factors, such as the nature of the company's business, the special conditions necessary for the introduction of online trading, market's needs and the conditions under which people use this type of purchase, the degree of competition in the electronic market and previous experience of the company.

Theoretical and empirical studies have attempted to identify the diffusion pattern of a strategy or a technology and contexts that influence innovation adoption and implementation. Considering the adoption of e-insurance, there are two levels of adoption – organizational and individual (Scupola, 2009). Initially, technology should be acquired and adopted by an organization and, subsequently, it must be accepted by the ultimate users in that organization, namely implemented. Therefore, there are studies that provide explanation of this phenomenon at the macro level (industry, market, nation) and micro level (firm) (Rodríguez-Ardura & Meseguer-Artola, 2010). The most commonly used (Looi, 2005; Awa et al., 2015; Oliveira & Martins, 2011) are the Theory Reasoned Action (TRA); the Theory of Planned Behavior (TPB); the Technology Acceptance Model (TAM); The Diffusion of Innovation Theory (IDT); the Technological, Organizational and Environmental Framework (TOE); the Decision Maker Technological, Organizational and Environmental Framework (DTOE), and the Unified Theory of Acceptance and Use of Technology (UTAUT).

A literature review as well as empirical studies provide support for the Technological, Organizational and Environmental (TOE) Framework (Tornatsky & Fleischer, 1990) as a useful analytical framework for studying e-business adoption and assimilation of different types of IT innovation. The TOE framework identifies three aspects of an enterprise's context that may determine the decision to adopt and implement technological innovation:

- the technological context refers to all available technologies – internal ones that are already in use in the enterprise and external, innovative technologies available in the market, but not currently in use in the enterprise;
- the organizational context describes the organization in terms of scope, size and managerial structure, and
- the environmental context includes the characteristics of enterprise's industry, technology service providers and regulations.

Considering that publicly available data on level of digitalization in insurance companies in the Republic of Serbia are scarce, the TOE aspects of technological adoption in this study are considered in much broader context relying on the financial statements of the companies and ratio analysis.

The technological context refers to perceived benefit of e-business adoption, compatibility between organizational policies and technology innovation, and cost of a certain technology, that influence the adoption of e-business technology. Perceived benefits and the level of compatibility can be considered as internal and qualitative factors. It is assumed that level of technological resources available positively influences the adoption of e-business by insurance companies (Rodríguez-Ardura & Meseguer-Artola, 2010). Therefore, the first hypothesis that will be considered in this research is stated as follows:

H1: The technological factors positively affect the level of e-insurance adoption.

The technological context of TOE framework in this study is assessed by the share of software's value in the value of the total asset of the insurance company (S/A).

The organizational context in terms of insurance industry refers to the organizational aspects of the insurance company that can determine managers' decision to adopt IT, such as existing technology infrastructure, relevant systems, human and financial resources, firm size etc. According to the previous studies (Del Aguila-Obra & Padilla-Meléndez, 2006), the second hypothesis is defined:

H2: The organizational factors positively affect the level of e-insurance adoption.

In this study several indicators of organizational factors are used: (1) the financial strength of the company measured by the equity-to-asset ratio (C/A), (2) the profitability of the company measured by the net return on asset ratio (NR/A), and (3) the efficiency of the company measured by the ratio of gross written premiums to the number of employees at the year-end (Pr/E).

The environmental context refers to external factors such as the demands of customers, suppliers and competitors, but also the level of technology support infrastructure and government involvement in fostering e-business adoption. In this study, the market share of insurance company (MS) is used as proxy for environmental factors. The market share refers to the share in total insurance premium in the Republic of Serbia. Since organizations tend to stay competitive and innovative in order to survive on the market (Oliveira & Martins, 2010), the third hypothesis is defined as follows:

H3: The environmental factors positively affect the level of e-insurance adoption.

Regarding the studies conducted in the insurance sector in the Republic of Serbia, it can be noted that the number of studies on the application of ICT in Serbian insurance companies is disproportionately small in relation to the importance of this issue. Studies usually analyze conditions for e-commerce

adoption in the distribution of insurance services (Piljan et al., 2016). The mini case study conducted by Bradić-Martinović and Zdravković (2012) revealed that the observed Serbian companies, as well as the insurance company, lacked the appropriate mechanism to control investments in IT. The observed insurance company did not consider investments in employees and network important for its IT strategy and made no evaluation of intangible benefits, which could lead to underestimated or overestimated value of investments in IT. Therefore, the proposed research complements the existing studies by analyzing various aspects of insurance companies' operations and their contribution to IT implementation.

The proposed research hypotheses are tested on Serbian insurance market using the representative sample of insurance companies. The dynamics of IT adoption in insurance is observed during period from 2015 to 2020. The following part of the paper presents the data sample and used research methodology.

3.2. Data description

According to the presented TOE framework, in this study, the proposed aspects of insurance company's business context are analysed using a panel-data approach covering 6-year time period (2015-2020) and 16 insurance companies that continuously operated in the Republic of Serbia in that period. Thus, the selected data set consists of 96 company-year observations. During the analysed period, the observed insurance companies acquire more than 80% of total market share and, therefore, can be considered as a representative sample for Serbian insurance industry.

The level of e-insurance adoption is presented by the binary variable *EIA* that takes two values: 0 if the company does not provide services of online sale and online claim reporting and 1 if company provides these e-services. The financial ratios are used to describe each aspect of TOE framework. Considering that measurement units of the selected financial ratios differ and that it can affect data analysis, min-max normalization is performed in order to preserve the relationships among the original data values. Descriptive statistics for variables used in analysis is shown in Table 2.

Table 2. Descriptive Statistics for Used Variables (sample)

Variable	Number of observations	Mean	Standard deviation	Minimum	Maximum
EIA	96	0.5625	0.4987	0.0000	1.0000
S/A	96	0.3272	0.2978	0.0000	1.0000
C/A	96	0.3448	0.2982	0.0000	1.0000
NR/A	96	0.5098	0.2716	0.0000	1.0000
Pr/E	96	0.3191	0.2580	0.0000	1.0000
MS	96	0.2234	0.2901	0.0000	1.0000

Source: Authors' calculation based on the financial statements of the selected insurance companies in the Republic of Serbia

A closer look over dynamics of e-insurance adoption in the Republic of Serbia reveals very low interest of insurance companies for providing e-services during the first 3 years, when less than half companies in the sample offered this type of service (in 2015 – 6 companies, in 2016 – 7 companies and in 2018 – 8 companies). During the period 2019 – 2020, the interest in e-insurance had been increased and 10 to 13 companies provided various e-services to their policyholders.

Testing for stationarity is conducted using the test of panel unit root of Im, Pesaran and Shin (2003) and Maddala and Wu (1999) and the obtained results are presented in Table 3.

Table 3. Results of the Panel Unit Root Tests (sample)

Test	Statistic	p-value
Im, Pesaran and Shin	-10.181	0.00000
Maddala and Wu	181.08	0.00000

Source: authors' calculation

Based on the results of tests it can be concluded that the series of variables are stationary. The relationship between each aspect of TOE framework on one side and the e-insurance adoption on the other is examined using the regression analysis.

3.3. Logistic regression analysis

The relationship between the categorical dependent variable and multiple independent variables can be determined using a logistic regression. The expected value of a dependent variable $y_i \in \{0, 1\}$ is the probability that it takes the value 1:

$$E(y_i) = 0 \times P(y_i = 0) + 1 \times P(y_i = 1) = P(y_i = 1) \tag{1}$$

Consider a sample of N independently and identically distributed (i.i.d.) observations $i = 1, \dots, N$ of the dependent variable y_i and a (K+1)-dimensional vector x_i' of explanatory variables including a constant. The probability that the dependent variable takes value 1 is modeled using binary response model as

$$P(y_i = 1|x_i) = F(z_i) = F(x_i'\beta) \tag{2}$$

where β is a (K+1)-dimensional column vector of parameters and $z_i = x_i'\beta$ is a single linear index. The function F maps the single index into [0,1] and satisfies in general following conditions: $F(-\infty) = 0$, $F(\infty) = 1$ and $\partial F(z_i)/\partial z > 0$. In the used logistic regression model, the transformation function F is the logistic function. The response probabilities are then

$$P(y_i = 1|x_i) = \frac{e^{x_i'\beta}}{1+e^{x_i'\beta}} = \frac{1}{1+e^{-x_i'\beta}} \tag{3}$$

The parameters of β are estimated using the maximum likelihood (ML) method. Assuming independence across observation, the log likelihood function for the logit model is

$$logL = \sum_{i=1}^{N}\big[(1 - y_i)\log\big(1 - F(z_i)\big) + y_i logF(z_i)\big] \tag{4}$$

Maximization of the ML estimator of β is performed by the Newton-Raphson algorithm.

4. Results and discussion

In order to avoid increasing the standard errors of independent variables' coefficients, and determine a reliable regression model, the issue of multicollinearity is examined. The obtained results of VIF test (Table 4) imply that there are no correlations between two variables considering that variance inflation factors do not exceed 10. Moreover, the values of coefficients 1/VIF are not below 0.2, thus it can be concluded that there is no multicollinearity in the proposed model.

Table 4 - VIF test of multicollinearity

Variable	VIF	1/VIF
S/A	1.198476	0.834393
C/A	1.130014	0.884945
NR/A	1.142598	0.875198
Pr/E	1.159132	0.862714
MS	1.253075	0.798037
Mean VIF	1.176659	

Source: Authors' calculation

The results of applied pooled logistic regression model to examine the effects of technological, organizational and environmental factors on e-insurance adoption are presented in Table 5. The obtained results indicate that two of three groups of factors have statistically significant influence on the achieved level of e-insurance adoption in the Republic of Serbia.

Considering the technological context of insurance companies' operations, the share of software's value in the value of the total asset of the insurance company (S/A) is not a statistically significant determinant of e-business adoption and implementation in Serbian insurance companies. New technologies, relevant for the implementation of e-commerce and claims reporting, what is the actual level of e-insurance adoption, does not require significant investments. Namely, during the observed time period, realized investments in software in insurance companies from the sample have been in average 0.35% value of the total assets. Therefore, the value of the technology in use cannot be considered important for this level of e-insurance adoption. Consequently, the first hypothesis in this study cannot be

accepted. However, at more advanced level of IT implementation, technological readiness of the enterprise and the market contribute significantly to the evolution of e-business in enterprises (Rodríguez-Ardura & Meseguer-Artola, 2010), as well as in insurance companies (Rodríguez Cardona et al., 2019). Therefore, insurance companies in the Republic of Serbia should implement more sophisticated framework for assessment of cost and benefits of investments in intangible assets and accordingly regard investments in IT on strategic level, as suggested by Bradić-Martinović and Zdravković (2012). Following the practice of insurance companies on developed markets, the insufficient capacities for IT implementation can be increased by acquisition of innovative InsurTech start-ups, companies specialized in telematics, aggregators and analytic companies (Gasc & Sandquist, 2014).

On the other hand, two of three indicators of organizational factors proved to be statistically significant determinants of e-insurance adoption in the Serbian insurance companies. At 1 percent level of significance, the financial strength of the insurance company measured by the equity-to-asset ratio (C/A) and the efficiency of the insurance company measured by the gross written premiums per employee (Pr/E) negatively affect the level of the e-insurance adoption. Although considered to favour digitalization, the influence of these factors may also depend on the level of IT adoption, as noted by Del Aguila-Obra & Padilla-Meléndez (2006). At this level of digitalization, insurance companies in the Republic of Serbia, 62.61% of total non-life premiums achieve through direct sale, while only 0.09% through internet (NBS, 2020). Therefore, the high efficiency of intermediaries supported by behavioral, institutional and cultural factors encourage the continued role of insurance intermediaries. If we observe the odds ratio $(\exp(\beta))$, it can be concluded that change in these indicators will negatively influence the odds for e-insurance adoption by the Serbian insurance companies. Therefore, it can be concluded that second hypothesis cannot be accepted in this study.

Considering the characteristics of insurance market, as well as insurance products, direct sales channels will remain important for certain groups of policyholders. However, the implementation of IT solutions, such as Customer Relationship Management (CRM), should enable a greater coverage of direct sales channels and add a dimension of individualization to digital channels in interaction with policyholders (Piljan et al., 2016). Therefore, IT usage, especially big data analytics, can complement and enhance the existing business solutions in the insurance companies, such as predictive analysis, which affects the determination of risk, claims and customer experience (Senousy et al., 2018).

Table 5. Estimated results of the logistic regression model

Variable	β	Standard Error	z-value	Pr(>|z|)	exp(β)	95% confidence interval for exp(β)	
						lower	upper
Intercept	-1.71	1.52	-1.12	0.26	0.18	0.01	3.98
S/A	2.94	1.98	1.48	0.14	18.92	0.46	1,376.11
C/A	-7.47	2.89	-2.59	0.01*	0.00	0.00	0.08
NR/A	2.52	1.83	1.38	0.17	12.47	0.43	692.73
Pr/E	-19.01	6.42	-2.96	0.00*	0.00	0.00	0.00
MS	69.02	20.12	3.43	0.00*	9.46e+29	1.25e+16	1.42e+51
Log-likelihood							-20.55546
Nagelkerke R^2							0.81804

Source: authors' calculation

The only variable that significantly and positively influence the odds of e-insurance adoption is the market share (MS) of insurance company. Considering the fact that e-insurance diminishes the difference between "small" and "large" insurers, but also between "small" and "large" insureds, it can be expected that the competition between the insurance companies is the main determinant of e-insurance adoption, as suggested by Oliveira and Martins (2010). Therefore, we can conclude that the third hypothesis can be accepted in this study. However, since there are modest range of services offered through e-insurance in Serbia, we can assume that e-insurance is the matter of reputation and tendency to achieve competitive advantage through innovation. Namely, the share of insurance premiums distributed through the direct online sales channel is rather small at the market of the Republic of Serbia. On the other hand, in most of the companies claims reports submitted online are rarely processed without the additional engagement of insurers. The insurance companies on the developed markets are taking a more comprehensive approach offering non-insurance products and services to their clients (Gasc & Sandquist, 2014). Since digital interaction becomes a norm of everyday life, prospect policyholders are seeking for wider range of services. In order to fulfil policyholders' expectations, the insurance companies need to increase the interactions in various areas such as health, education, mobility and leisure (Swiss Re, 2020).

5. Conclusion

Considering the fact that insurance industry is highly dependent on data, the exploitation of increasing amount of data using IT and analytics tools becomes the issue of high interest in insurance. Digitalization in insurance should create and use knowledge enabling insurance companies to gain competitive advantage. Digitalization imposes automatization and changes in existing business processes,

opens new communication channels and improves relationships with the existing customers, attracts new customers, and enables the development of new, more personalized, insurance products. However, insurance companies, especially in emerging markets, have to address numerous challenges in IT implementation, such as insufficient investment in computer hardware and software, low level of specialized and advanced computer literacy skills of employees, low level of e-business and m-business usage, unsatisfactory legal framework and low policy and regulatory adaptability to disruptive technologies, privacy and cybersecurity concerns and risks etc.

Analysis of digitalization in insurance sector in the Republic of Serbia reveals a very low level of IT implementation, especially regarding investment in new technologies such as big data analytics, robotics, and artificial intelligence. Most of the insurance companies have implemented only basic services, such as web-site and social media online presence, e-commerce limited to health and property insurance, and claims reporting. Only half of the observed companies offer enhanced services to policyholders through applications, such as transaction verifications and actionable alerts. The level of Serbian insurance companies' digitalization is significantly influenced by the organizational and environmental factors. Organizational factors have negative impact on IT adoption, while the environment, especially the pressure of the policyholders, can promote the digitalization of insurance services. However, the obtained results should be considered carefully, since the analysed factors are approximated using the ratios obtained from the financial reports of the insurance companies, since public data on digitalization in insurance companies are scarce. Therefore, the future research will aim to acquire more comprehensive data on the costs and benefits of IT implementation in insurance based on the survey of key staff appointed to develop and manage innovative business solutions in insurance.

Considering the overall conditions for e-insurance diffusion in the Republic of Serbia, the state of e-insurance can figuratively be described as an indecisive driver approaching intersection and looking at the traffic light. Some of the conditions are indicating the occurrence of green light, such as availability of internet infrastructure, government support, online and mobile payments adoption, as well as legal protection against the unauthorized use of systems and fraud, hacking, violating intellectual property, privacy violation etc. On the other side, red light is mainly caused by low customer trust, which is one of main obstacles for wide adoption of e-insurance in Serbia. The education is marked as yellow light, so further development of digital competences, as well as increasing the awareness of the significance and benefits of insurance services can contribute to the adoption of e-insurance in the Republic of Serbia.

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FAKTORI KOJI UTIČU NA DIGITALNU TRANSFORMACIJU OSIGURANJA U REPUBLICI SRBIJI

Apstrakt: Primena IT inovacija u sektoru osiguranja rezultira unapređenjem postojećih i kreiranjem novih poslovnih modela. E-osiguranje predstavlja kreiranje i pružanje usluga osiguranja, kao i povezanih finansijskih usluga, primenom digitalnih rešenja. U ovom radu je analiziran uticaj primene informacionih tehnologija i digitalizacije na sektor osiguranja u Republici Srbiji. Cilj predložene analize je da se utvrde determinante usvajanja inovativnih tehnoloških rešenja u sektoru osiguranja u Srbiji. Prema TOE okviru mogu se izdvojiti tri grupe faktora koji utiču na prihvatanje IT u e-osiguranju, a to su tehnološki, organizacioni i faktori okruženja. Panel analiza i logistička regresija su primenjeni za ispitivanje efekata predloženih faktora na prihvatanje e-osiguranja. Dobijeni rezultati pokazuju da organizacioni i faktori okruženja imaju statistički značajan uticaj na dostignut nivo prihvatanja e-osiguranja, dok jedino tržišno učešće osiguravajuće kompanije pozitivno utiče na verovatnoću prihvatanja e-osiguranja. Stoga se može zaključiti da je e-osiguranje u Republici Srbiji stvar prestiža i težnje osiguravača da kroz inovacije ostvare kratkoročne dobitke i konkurentsku prednost.

Ključne reči: digitalna transformacija, osiguranje, e-usluge, e-osiguranje, usvajanje tehnologije, TOE okvir, panel analiza.

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