

“Digitalization of the insurance business: Systematization of net effects through the example of Russia”

AUTHORS

Gulnara Kaigorodova  <https://orcid.org/0000-0002-8248-0735>
 <https://publons.com/researcher/2591131/gulnara-n-kaigorodova/>
Alfiya Mustafina  <https://orcid.org/0000-0002-3717-9396>
 <https://publons.com/researcher/2595588/alfiya-a-mustafina/>
Guzel Pyrkova  <https://orcid.org/0000-0002-2733-4815>
 <https://publons.com/researcher/2177373/guzel-pyrkova/>
Mariola Grzebyk  <https://orcid.org/0000-0003-1107-0250>
 <https://publons.com/researcher/1627527/mariola-grzebyk/>
Larisa Belinskaja  <https://orcid.org/0000-0003-3935-8387>

ARTICLE INFO

Gulnara Kaigorodova, Alfiya Mustafina, Guzel Pyrkova, Mariola Grzebyk and Larisa Belinskaja (2021). Digitalization of the insurance business: Systematization of net effects through the example of Russia. *Insurance Markets and Companies*, 12(1), 32-42. doi:[10.21511/ins.12\(1\).2021.03](https://doi.org/10.21511/ins.12(1).2021.03)

DOI

[http://dx.doi.org/10.21511/ins.12\(1\).2021.03](http://dx.doi.org/10.21511/ins.12(1).2021.03)

RELEASED ON

Friday, 19 February 2021

RECEIVED ON

Sunday, 27 December 2020

ACCEPTED ON

Monday, 15 February 2021

LICENSE



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/)

JOURNAL

"Insurance Markets and Companies"

ISSN PRINT

2616-3551

ISSN ONLINE

2522-9591

PUBLISHER

LLC "Consulting Publishing Company "Business Perspectives"

FOUNDER

LLC "Consulting Publishing Company "Business Perspectives"



NUMBER OF REFERENCES

45



NUMBER OF FIGURES

2



NUMBER OF TABLES

2

© The author(s) 2021. This publication is an open access article.



BUSINESS PERSPECTIVES



LLC "CPC "Business Perspectives"
Hryhorii Skovoroda lane, 10,
Sumy, 40022, Ukraine
www.businessperspectives.org

Received on: 27th of December, 2020

Accepted on: 15th of February, 2021

Published on: 19th of February, 2021

© Gulnara Kaigorodova, Alfiya Mustafina, Guzel Pyrkova, Mariola Grzebyk, Larisa Belinskaja, 2021

Gulnara Kaigorodova, Ph.D. in Economics, Associate Professor, Department of Money and Securities, Kazan Federal University, Russia. (Corresponding author)

Alfiya Mustafina, Ph.D. in Economics, Associate Professor, Department of Money and Securities, Kazan Federal University, Russia.

Guzel Pyrkova, Ph.D. in Economics, Associate Professor, Department of Money and Securities, Kazan Federal University, Russia.

Mariola Grzebyk, Doctor of Economics, Professor, Head of the Department of Economics and Management, University of Rzeszów, Poland.

Larisa Belinskaja, Doctor of Economics, Professor, Department of Business, Vilnius University, Lithuania.



This is an Open Access article, distributed under the terms of the [Creative Commons Attribution 4.0 International](https://creativecommons.org/licenses/by/4.0/) license, which permits unrestricted re-use, distribution, and reproduction in any medium, provided the original work is properly cited.

Conflict of interest statement:

Author(s) reported no conflict of interest

Gulnara Kaigorodova (Russia), Alfiya Mustafina (Russia), Guzel Pyrkova (Russia), Mariola Grzebyk (Poland), Larisa Belinskaja (Lithuania)

DIGITALIZATION OF THE INSURANCE BUSINESS: SYSTEMATIZATION OF NET EFFECTS THROUGH THE EXAMPLE OF RUSSIA

Abstract

The pace of digitalization of the insurance industry lags behind similar processes in the banking sector. The main tasks that a Russian insurer solves when using IT technologies are the automation of business operations and the formation of an online system of interaction with customers with the main focus on sales.

The purpose of this study is to systematize the effects achieved by insurance market participants when introducing IT technologies and identify incentives to accelerate the insurance sector digitalization. The goal of digitalization of Russian insurers should be the formation of a client interface with a full cycle of services; the transfer to a qualitatively new level of business processes while ensuring the required level of protection; formation of fundamentally new and timely renewal of the existing insurance products.

The priority areas of IT technologies used by Russian insurers are identified: cloud computing, chat bots, and information resources that provide online interaction with customers. Factors that have a stimulating effect on the digitalization of the insurance sector are identified: cost reduction, acceleration of business processes, improvement of the quality of customer service and increased competitiveness. The problems and risks of insurers that restrain the use of IT technologies are formulated: high costs of digitalization, lack of qualified personnel, cyber risks, moral and ethical problems.

Keywords

insurance, InsurTech, IT technologies, information systems, business processes

JEL Classification

G22, O16, O31

INTRODUCTION

Modern trends in society are shaping the demand for financial services based on the use of IT technologies. The emergence of new risks in human life and economic activity of companies, an increase in the frequency of implementation of the already insured risks, and the need to distance market participants in a pandemic make it necessary for insurance companies to introduce innovations to meet modern demand parameters and ensure quick decision-making. At the same time, the strengthening of regulatory requirements, the entrepreneurial desire to minimize costs, the evolutionary improvement of business processes and the need to improve the image necessitate the automation of insurance companies' internal environment and operations. Information systems are the driving force behind organizational changes in insurance companies.

A study of the Russian insurance market, conducted by KMPG, showed that in 2020 76% of the surveyed Russian insurance companies did not have any serious difficulties when their employees

switched to distant working. This indicates a sufficient level of efficiency of the IT systems used by companies. The identified problems were associated with difficulties in communicating with employees (24% of respondents), communicating with customers (12%), information security (18%), the emergence of new user needs that are not satisfied with the current infrastructure and software (18%). However, only 10% of Russian insurance companies have a high level of digital activity, and these are big insurers (KMPG, 2020).

Among the risks to which the Russian insurance business is exposed, in addition to the risk of a market downturn, respondents highlight business risks (65%), fraud risk (59%) and operational risks (35%) (KMPG, 2019). Losses from external fraud are estimated by 53% of respondents to be at 2-10 % of the collected premiums. At the same time, a third of respondents do not have a clear idea of the potential benefits from the implementation of new technologies. The types of insurance most susceptible to fraud include compulsory motor liability insurance (the share of fictitious payments is 87% in the structure of all fraudulent payments), CASCO (8%), accident insurance (2%) (Deloitte, 2020). These data demonstrate the potential cost effects from the introduction of such areas of IT technologies as artificial intelligence, the Internet of Things and machine learning.

Insurers may not always understand the potential positive effects of using specific IT technologies. In addition to the high cost of the digitalization process, the existing IT architecture in a company is a limitation. Therefore, the issue of finding and choosing a technology that best meets the strategic goals of the insurer is relevant.

1. LITERATURE REVIEW AND RESEARCH ANALYSIS

The modern IT market provides insurers with a wide range of technologies for the implementation of various tasks. Their use, as a rule, is limited, first of all, by the financial capabilities of the insurer.

The total investment in fintech companies is showing significant growth. After exploding in 2016, investment in InsurTech and insurance start-ups fell by more than half in 2018 (Figure 1). Global instability and trade wars have led to a decrease in interest in investment in InsurTech. However, as analysts note, the emergence of new risks, increased competition and consideration of customer needs will lead to an increase in investment in the insurance IT sector. Already in 2019, the volume of such investments increased to USD 6.3 billion, and at the end of the third quarter of 2020, investments amounted to USD 5 billion. Moreover, after the difficult first half of 2020, there was a surge in activity in the third quarter (Cbinsights, 2020).

Investing in digitalization provides a positional advantage to any business. The issues of digital transformation in the financial sector are widely studied. The theoretical foundations of IT technologies in the

insurance business are reviewed by Huckstep (2017a, 2017b), and Adamova et al. (2018).

Werth et al. (2020) and Doszhan et al. (2020) identified factors influencing the digital transformation of financial and insurance business. These are political (regulatory issues), economic (low profitability of financial business in recent years, increased costs, macroeconomic conditions), social (an increasing number of consumers want to receive services online, as well as the coronavirus pandemic), and technological (new technologies are exerting pressure on insurers). It was noted that banks, compared to insurance companies, have more easily standardized and manageable products, so they are easier to adapt to IT technologies.

Werth et al. (2020) believe that the main area of application of IT-technologies in insurance is the development of new insurance products based on blockchain technology (distributed ledger technology). According to the authors, such products can have a real advantage on the market as they reduce the customers' time and financial costs. The risks accompanying the use of blockchain technology in the insurance business have been investigated.

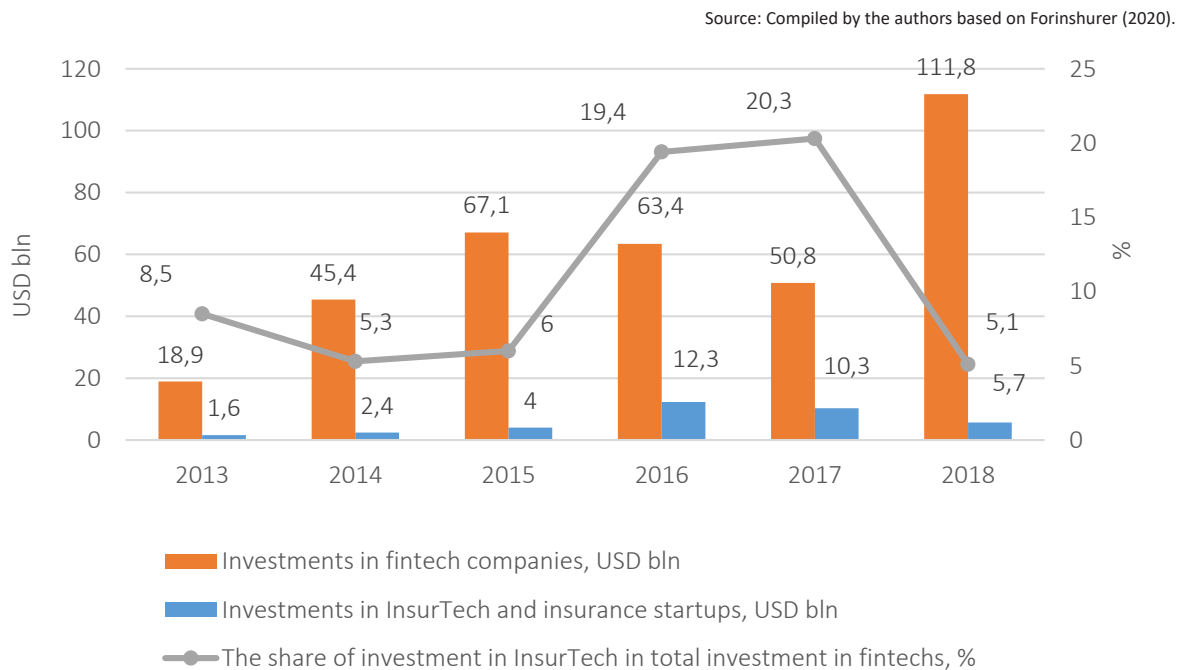


Figure 1. Dynamics of investment in fintech companies and InsurTech

The issue of costs of the digitalization process is relevant. Polinkevych (2016) and Pukala et al. (2019) analyze possible ways for companies to implement IT technologies (through internal innovation, purchase of startups, partnerships or investments in startups).

Eling and Lehmann (2018) examined the insurer's value creation process in the context of using IT solutions. The authors proposed three key areas of changes in the insurance industry:

- 1) new technologies change the way insurers interact with customers of their services;
- 2) new technologies are used to automate, standardize and improve the efficiency and effectiveness of business processes; and
- 3) new technologies create opportunities for modifying the existing products and developing new ones.

To improve the efficiency of processes and minimize the costs of digitalization, many insurers, especially small players, will outsource part of their business processes (Eling & Lehmann, 2018).

Digitization is the integration of the analog and digital worlds with new technologies (Bukhtiarova

et al., 2018) that improve customer engagement, data accessibility and business processes (Eling & Lehmann, 2018; Trunina et al., 2019).

Eckert and Osterrieder (2020) investigate the application of basic IT technologies in insurance (BigData, artificial intelligence, internet of things, cloud computing, blockchain) and formulate the requirements for an insurer's information system.

Bohnert et al. (2019) conducted a study of 41 public insurance companies in Europe in terms of the relationship between a company's use of digital technology and business success, as measured by the market value of companies. The analysis revealed that insurance companies that digitize their internal procedures and use IT technologies when interacting with customers have an average market value of 8% higher than companies that do not pay attention to digitalization issues.

Researchers reveal the mechanisms of functioning and the results of using certain IT-technologies in the insurance business. Grize et al. (2020) look at the applied aspects of using machine learning. They conclude that a successful application of machine learning requires the coordinated interaction of three components: qualified personnel, a database and selected instruments. Creating and

enabling the environment for the use of machine learning technologies requires profound changes in the company. Pettersson et al. (2019) investigated the implementation of “smart insurance” by using the Internet of things in Sweden. The authors concluded that insurance companies’ employees are demotivated to implement this technology, since such products lead to the individualization of insurance premiums and, as a rule, to a decrease in the insurer’s income.

Systematization of IT technologies, which are widespread in the insurance market, allows us to form the following list:

- artificial intelligence (AI);
- Internet of Things (IoT);
- robotic process automation (RPA);
- cognitive technologies (CT);
- online platforms;
- big data (Big Data);
- distributed ledger technologies (DLT);
- machine learning (ML);
- cloud computing.

Typically, they are used in synthesis and combination. Some of them are the development of earlier technologies.

On the other hand, many researchers analyze the use of IT technologies to improve individual business processes of insurers. For example, Bryzgalov et al. (2020) show that big databases and artificial intelligence are prioritized in underwriting, while new technologies are prioritized in underwriting (telematics, biomonitoring, and others). Marketing research of insurance is very important for the promotion of insurance products (Horyslavets et al., 2018; Kaigorodova et al., 2020a, 2020b; *Plonka et al.*, 2020; Finogenova et al., 2020), and insurance products based on BigData and artificial intelligence are more successful than traditional ones (Levina et al., 2015). Researchers often focus on developing a specific area of insurance using innovative technologies (Vinogradova et al., 2019; Petukhova et al., 2018, Lisowski & Chojan, 2020). The issues of digitalization are also considered in the studies of insurance intermediaries. In particular, Röschmann (2018) explored the innovative potential of insurance brokers.

The studies of digitalization processes in the insurance business in emerging insurance markets set the task of supporting the use of IT technologies, identifying problematic development factors (Stepanova, 2020; Sembekov, 2020; Mustafina et al., 2020), characterizing the main areas of digitalization, digitalization of individual business processes (Tsyganov & Bryzgalov, 2018).

Aksyutina (2020) determines that digital transformation of the insurance market will be associated with the formation of personal proposals for the purchase of insurance products and settlement of insurance claims. The focus is also on the presence of territorial imbalances on the Russian insurance market.

Bryzgalov et al. (2020) cite the results of a study concerning the degree of digitalization of the Russian insurance market, offering indicators for such an assessment, and identify priority digital technologies and prospects for their implementation. The research of the Russian insurance market, conducted by KMPG, reveals the most popular information technologies used in the insurance business (Figure 2).

Accordingly, in 2020 cloud technologies – artificial intelligence tools such as chat bots, as well as information resources (online interaction with customers) were actively used. Moreover, these first three positions significantly advanced in 2020 compared to 2019 (more than 20% each). Individual machine learning tools have received different distribution in business processes. They began to be actively used in 2020 in sales, marketing and claim settlements. Compared to 2019, the share of insurance companies using optical recognition systems (artificial intelligence tools) has decreased. It should be noted that from 25% to 33% of respondents do not plan to use machine learning models, robotization and optical recognition systems in the near future. Half of the respondents use blockchain technologies and the Internet of Things.

A number of works raise moral and ethical issues of protecting a person’s private life, limiting his freedoms when implementing information technologies and potential discrimination (Khominich & Savina, 2020; Porrini, 2017).

Source: Compiled by the authors based on KMPG (2019, 2020).

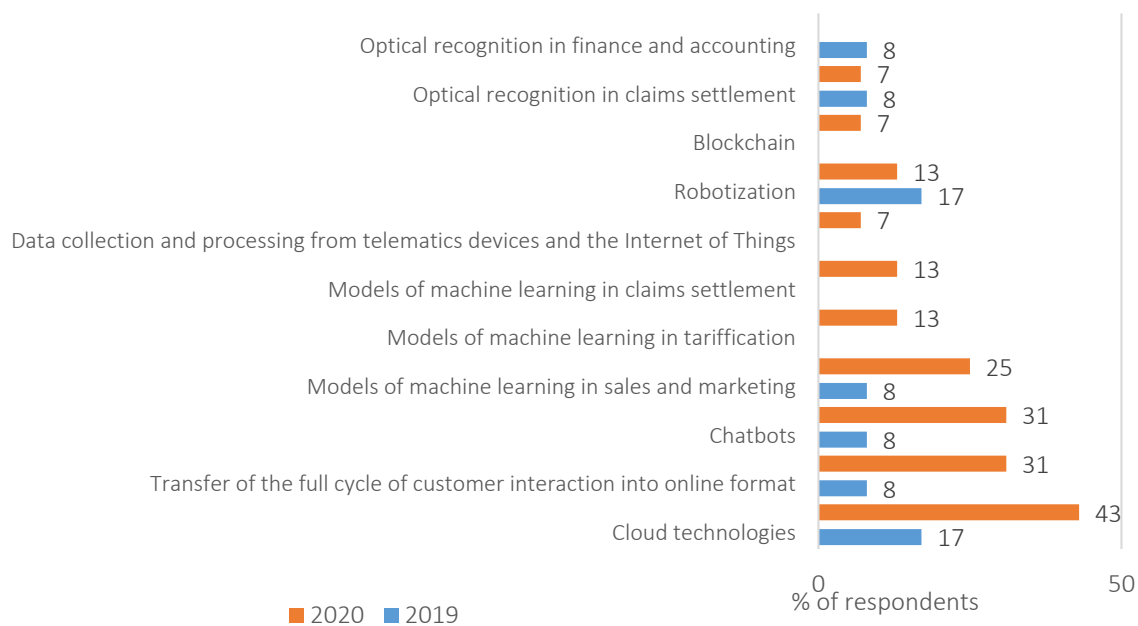


Figure 2. The use of new technologies by Russian insurance companies (at the stage of the full use)

A separate block of research is related to the expansion of cyber risks in implementing digital technologies. Pooser et al. (2018) note that there is a growing understanding of cyber threats among managers of insurance companies. The main threats from cyber risks for the business processes of insurers have been studied (Kaigorodova et al., 2020a, 2020b).

2. GENERALIZATION OF MAIN STATEMENTS

When introducing information technologies, the insurer seeks to solve the following tasks:

- improving the quality of customer service;
- improving business processes;
- development of new and modification of the existing insurance products;
- obtaining competitive advantages over other financial institutions and spheres;

- formation of new sales channels (Dankiewicz et al., 2020).

A full-fledged solution of all the listed tasks is based on the wide use of various resources (Table 1).

P2P insurance stands apart in the network possibilities of providing insurance protection. A relatively new form of damage distribution allows reducing the costs for the classic organization of insurance coverage. Now P2P insurance is spreading in China and the European countries. However, the issues of state regulation have not been resolved and, due to the network nature, the risks of fraud are high.

The considered resources and IT-technologies demonstrate the already applied and new opportunities for the Russian insurance business. The generalization of research in this area indicates that the implementation of technological innovations makes it possible to reduce costs, automate and accelerate business processes and reduce exposure to insurance fraud.

Consideration by the insurer of the issue of using a particular digital technology involves studying

Table 1. Information resources used in the insurance business

Source: Compiled by the authors.

Area	Consumer of results	Resultant value for a consumer	The main problem points
Insurance business automation software	- insurer; - owner of the insurance business; - regulator	- sales automation; - improvement of business processes, including: - reduction in the number of errors; - optimization of the preparation of reports, responses to requests from the regulator; - actuarial modeling; - taking into account the individual customer's profile	- high price; - the complexity of integration with the existing software products of the insurance company
Data platforms	- insurer; - customers; - partners	- the ability to quickly access the accumulated data; - understanding of customer preferences; - the possibility of forming an integrated information environment; - improving the quality and speed of customer service	- the main sources of data are located on the outside of the insurance company (mobile operators, online stores and other third-party platforms); - loosely structured data obtained from different sources
Financial supermarkets	- insurer; - insurance intermediaries; - policyholders	- expansion of the insurance field; - a wide range of insurance products; - an opportunity for intermediaries to work with insurance companies	- selection of a platform, which is adequate to the capabilities and needs of the insurance company; - increased competition
Social networks	- potential policyholders; - current clients	- an additional communication channel; - potential to increase sales; - improved quality of service	- professional presence in all popular networks requires the hiring of additional employees; - unfair competition, formation of the company's negative image
Mobile applications	- potential policyholders; - clients; - insurer	- cost optimization for the conclusion of an insurance contract; - increase in sales volumes; - obtaining by the insurer of a large array of information in order to improve the tariff policy and to settle losses.	requires regular updating of the application
Email (e-mail newsletters)	- potential policyholders; - clients; - insurer	advertising	- low return; - negative image of the company
Electronic sales	- potential consumer of insurance services; - customers	- wide coverage of the insurance field; - increase in sales volumes; - reducing the cost of conclusion of an insurance contract; - improving customer service (for example, the ability to settle claims)	- insurance fraud; - reliable protection against cyber risks is required

the technology's possibilities, as well as the results of its implementation (Table 2).

As a rule, each of the considered technologies is implemented in combination. Eckert and Osterrieder (2020) examine the interdependencies of the main IT technologies used in insurance, showing that almost all of them, complementing each other, improve the quality of solutions implemented with their help.

3. DISCUSSION

When using IT solutions and resources, it is necessary to take into account a number of restrictions and emerging additional risks in the activities of insurers. Research in this area highlights a complex of socio-ethical problems associated with collecting datasets. Despite economically justified use of personal data, for example, in the Internet of Things (Bogoviz et al., 2019), there is a prob-

Table 2. The use of IT technologies in insurance

Source: Compiled by the authors.

IT-technologies	Opportunities for the insurer	Resultant effect
1. Artificial Intelligence (AI)	- to track patterns of fraudulent behavior; - to simulate and mark implicit facts and circumstances of the insured event by identifying inaccuracies; - to assess and process information, including information obtained by using big data technology; - to remotely assess the cost of damage; - chat bots answer basic customer questions	- a decrease in the number of payments for fraudulent cases; - simplification of authorization through the system of face recognition; - improved quality of claims settlement through automatic analysis of images and objects; - predictive analytics regarding future insurance payments; - reduced costs of insurers for the settlement of claims (up to 10%); - increased speed of customer service; - interactive and, at the same time, automated consulting of customers
2. Internet of Things (IoT)	- to take into account the peculiarities of a particular insurance object; - to individualize the insurance rate; - to implement the preventive function of insurance through the analysis of customers' behavioral characteristics	- an increase in intrinsic value of insurance services for the consumer; - reduced costs for insurers; - a fair rate for policyholders; - increased interest in insurance; - control over the behavior of insured persons (but moral, ethical and legislative problems are possible); - formation of an ecosystem with companies from other industries.
3. Robotic process automation (PRA)	to automate repetitive tasks by using software robots (documents entry, checking of documents, checking of information provided by customers, etc.)	- reduced time for document processing; - elimination of manual entry of information; - reduced time of compensation for losses; - reduced number of errors
4. Cognitive technologies (CI)	- to expand traditional artificial intelligence systems; - to quickly assess the changing situation; - to identify new cyber risks	- reduced time spent on restructuring the existing IT architecture within the company; - maximum consideration of risk changes in tariffs; - increased IT security
5. Online platforms	to expand the capabilities of sales channels	- increased influx of clients; - development of competition
6. Big data	- to calculate the probability of risks that were not previously covered by insurance; - to form an individual client profile; - to track the needs of potential consumers; - to identify client segments of the current moment; - to follow trends in changes regarding consumer preferences; - to keep records of the level of satisfaction with the actions of insurance companies	- to offer relevant insurance products; - to receive in-depth analytics; - to make investment decisions on the use of own funds and funds from insurance reserves
7. Distributed ledger technologies (DLT)	- critical information is simultaneously stored, created and updated on all media for all members of the registry based on the specified algorithms, ensuring its identity for all users; - instant exchange of information between registry members	- ensures consistency, synchronization, invariability and transparency of the stored information; - protection, security of data exchange; - the ability to provide fast interaction during insurance transactions affecting participants in different geographic regions; - effective work with partners to settle claims; - local and cross-border secure payments
8. Machine learning (ML)	- search for new segments; - building a multifactor model; - creation/optimization of risk models; - as a subtype neural networks; - assistance in image recognition	- an increase in the sales market; - reduction of losses; - reduction of fraud; - effective underwriting, etc.
9. Cloud computing	- optimization of underwriting; - optimization in the preparation of reports; - cost reduction for a number of items	- integrated storage of information with the expansion of self-service capabilities of customers; - optimization of information flows within the company; - optimization of the preparation of reports; - cost reduction for a number of items.

lem of personal freedom and loss of confidentiality. This generates, at least, moral considerations. And if the telematics used to control the behavior of customers can fit into the legal framework of insurance contract, then the acquisition of data from third-party aggregators can lead to many reputational risks for insurance companies. Loi et al. (2020) conclude that, taking into account the ethical norms of private life and personal freedom, there should be at least some legal regulations governing this issue, and, as a maximum, tangible economic benefits for those clients who agree to “digital surveillance”. Porrini (2017) focuses on state regulation of this issue.

Secondly, additional operational risks may arise (Polinkevych et al., 2021) when using artificial intelligence technologies, robotic process automation and cloud computing. It is also necessary to highlight cyber risks of hacker attacks and targeted data corruption (Kaigorodova et al., 2020a, 2020b).

The limitations considered by almost all researchers include high costs of the business digitalization process. Additional costs arise when integrating the acquired IT-technological solutions into the existing information system of insurance company. This problem is especially relevant for

medium and small market players. The solution to the problem is possible by forming an ecosystem through integration with other market players and companies from other branches, for example, with banks (Fedorova, 2020; Khuzhamov et al., 2020). However, there are problems of business secrets, loss of customer base and competitive advantages.

Today, the problem of personnel decisions in the implementation of IT technologies is no longer so significant, but its existence should not be denied. In addition, each subsequent step of business digitalization requires improved IT security (Zhabynets, 2014).

The study made it possible to identify factors stimulating the introduction of information technologies in insurance companies: increased competitiveness; reduced costs on servicing one client; reduced operating costs for one business transaction; adaptation to client needs; improved quality of customer service; coverage of new carriers (technical means) of information technologies and the Internet of Things; access to international global markets; expansion of the target audience (coverage of highly mobile groups); acceleration of business transactions; elimination of “bottlenecks” in business operations; improved capacity (structuring) of information.

CONCLUSION

When implementing digital technologies in the insurance business, the following basic conditions must be taken into account, thanks to which the insurer will get the most out of this process: own objectives of strategic and tactical development; systematic analysis of business processes for making informed decisions on their digitalization taking into account the existing IT architecture within the company; trends in the development of external environment; capabilities of specific IT technologies; potential effects from the implementation of specific IT solutions.

Information systems provide Russian insurance companies not only with the possibility to automate processes and expand sales channels, but, to a greater extent, with the prospects for strategic development of businesses based on the improved quality of customer service within the framework of “input – output”, expanding the coverage of the insurance field and offering new insurance products by studying emerging needs, updating existing insurance products, increasing the reliability of risk assessment and replenishing the list of insured risks. However, the above data indicate that the greatest demand is for IT solutions that increase the automation of business operations, improve the efficiency of sales channels and feedback mechanisms. Technologies related to telematics, optical face and object recognition and blockchain are lagging behind.

Based on the proposed systematization of the effects achieved through the implementation of IT technologies, it is advisable for Russian insurers to focus on using IT solutions aimed at: reducing the level of

internal and external insurance fraud (through the use of artificial intelligence tools, machine learning); forming a client interface in terms of claims settlement (using artificial intelligence systems, optical recognition, etc.); updating and customizing insurance rates (based on the Internet of Things, cognitive technologies, big data, cloud computing), which will lead to greater transparency in the formation of a fair price for insurance.

These changes will increase the value component of insurance services in the eyes of consumers. And the improved business model of the insurer, based on IT solutions, additionally integrated into the existing architecture of the information system, will allow it to be strategically competitive with other market players.

AUTHOR CONTRIBUTIONS

Conceptualization: Gulnara Kaigorodova, Alfiya Mustafina, Mariola Grzebyk

Data curation: Gulnara Kaigorodova, Guzel Pyrkova, Mariola Grzebyk

Formal analysis: Gulnara Kaigorodova, Alfiya Mustafina, Larisa Belinskaja

Investigation: Gulnara Kaigorodova, Guzel Pyrkova.

Methodology: Gulnara Kaigorodova, Alfiya Mustafina, Mariola Grzebyk, Larisa Belinskaja

Project administration: Gulnara Kaigorodova.

Supervision: Gulnara Kaigorodova, Guzel Pyrkova, Larisa Belinskaja

Validation: Gulnara Kaigorodova, Alfiya Mustafina.

Visualization: Gulnara Kaigorodova, Guzel Pyrkova.

Writing – original draft: Gulnara Kaigorodova, Mariola Grzebyk

Writing – review & editing: Gulnara Kaigorodova, Larisa Belinskaja.

REFERENCES

- Adamova, M., Boudet, J., Ka-laoui, H., & Segev, I. (2018). *How traditional insurance carriers can disrupt through personalized marketing*. August. McKinsey Company. Retrieved from <https://www.mckinsey.com/industries/financial-services/our-insights/how-traditional-insurance-carriers-can-disrupt-through-personalized-marketing>
- Aksyutina, S. (2020). Insurance Transformation: Innovative Products and Technologies. *Ekonomika, Predprinimatelstvo i Pravo – Economics, Entrepreneurship and Law*, 10(2), 395-410. (In Russian). <https://doi.org/10.18334/epp.10.2.100463>
- Bogoviz, A., Tsvetkova, L., Bodiako, A., Gimelshteyn, A., & Tretyakova, I. (2019). The model of trust management in the age of the internet of things from the positions of various interested parties. In E. Popkova (Ed.), *Ubiquitous Computing and the Internet of Things: Prerequisites for the Development of ICT* (pp. 1163-1170). https://doi.org/10.1007/978-3-030-13397-9_119
- Bohnert, A., Fritzsche, A., & Gregor, S. (2019). Digital agendas in the insurance industry: the importance of comprehensive approaches. *The Geneva Papers on Risk and Insurance – Issues and Practice*, 44, 1-19. <https://doi.org/10.1057/s41288-018-0109-0>
- Bryzgalov, D., Gryzenkova Yu., & Tsyganov, A. (2020). Prospects for Digitalization of the Insurance Business in Russia. *Finansovyy zhurnal – Financial journal*, 12(3), 76-90. (In Russian). <https://doi.org/10.31107/2075-1990-2020-3-76-90>
- Bukhtiarova, A., Hayriyan, A., Bort, N., & Semenog, A. (2018). Modeling of FinTech market development (on the example of Ukraine). *Innovative Marketing*, 14(4), 34-45. [https://doi.org/10.21511/im.14\(4\).2018.03](https://doi.org/10.21511/im.14(4).2018.03)
- Cbinsights. (2020). *Insurance Tech Q3 2020*. Retrieved from <https://www.cbinsights.com/research/report/insurance-tech-q3-2020/>
- Dankiewicz, R., Tworzydło, D., & Ostrowska-Dankiewicz, A. (2020). Distribution of services within the call center and Covid 19 – A case study. *WSEAS Transactions on Business and Economics*, 17, 921-932. <https://doi.org/10.37394/23207.2020.17.90>
- Deloitte. (2020). *Strakhovoy sektor: zadachi segodniashnego dnya i prognozy [Insurance Sector: Today's Challenges and Forecasts]*. (In Russian). Retrieved from <https://www2.deloitte.com/ru/ru/pages/risk/events/20-04-2020.html>
- Doszhan, R., Nurmaganbetova, A., Pukala, R., Yessenova, G., Omar, S., & Sabidullina, A. (2020). New challenges in the financial management under the influence of financial technology. *E3S Web of Conferences*, 159(5), 04015. <https://doi.org/10.1051/e3s-conf/202015904015>

11. Eckert, C., & Osterrieder, K. (2020). How digitalization affects insurance companies: overview and use cases of digital technologies. *Zeitschrift für die gesamte Versicherungswissenschaft*. <https://doi.org/10.1007/s12297-020-00475-9>
12. Eling, M., & Lehmann, M. (2018). The Impact of Digitalization on the Insurance Value Chain and the Insurability of Risks. *The Geneva Papers on Risk and Insurance – Issues and Practice*, 43, 359-396. <https://doi.org/10.1057/s41288-017-0073-0>
13. Fedorova, T. A. (2020). Insurance in the System of Financial Market Institutions. *Strakhovoye delo – Insurance*, 9, 3-17. (In Russian). Retrieved from <http://www.ankil.info/lib/1/301/2495/>
14. Finogenova, Y., Kaigorodova, G., Plonka, M., Jedynak, T., Poharchenko, T., & Zelenitsa, I. (2020). Awareness and Attitudes of Students to The Prospect of a Secure Old Age. *Proceedings 36th International Business Information Management Association Conference, IBIMA*. Granada, Spain.
15. Forinshurer. (2020). *Investments in the global fintech and insurtech sector increased in 2018*. Retrieved from <https://forinsurer.com/news/19/02/21/36611>
16. Grize, Y., Fischer, W., & Lützel-schwab, C. (2020). Machine learning applications in nonlife insurance. *Applied Stochastic Models in Business and Industry*, 36(4), 523-537. <https://doi.org/10.1002/asmb.2543>
17. Horyslavets, P., Plonka, M., & Trynchuk, V. (2018). Experience marketing and its tools in promoting the insurance services. *Innovative Marketing*, 14(1), 41-48. [https://doi.org/10.21511/im.14\(1\).2018.05](https://doi.org/10.21511/im.14(1).2018.05)
18. Huckstep, R. (2017a). *Digital transformation is the strategic imperative no insurer can ignore*. Retrieved from <https://www.the-digital-insurer.com/blog/insurtech-digital-transformation-strategic-imperative-no-insurer-can-ignore/>
19. Huckstep, R. (2017b). *Metromile: the pioneers of digital engagement insurance*. Retrieved from <https://www.the-digital-insurer.com/blog/insurtech-metromile-pioneers-engagement-insurance/>
20. Kaigorodova, G., Mustafina, A., Pyrkova, G., Mamchur, R., Zelenitsa, I., & Kul, T. (2020a). Growth Factors of Insurance Interests of Russian Citizens. *Proceedings 36th International Business Information Management Association Conference, IBIMA*. Granada, Spain.
21. Kaigorodova, G., Mustafina, A., Pyrkova, G., Vyukov, M., & Davletshina, L. (2020b). Cyber Risks for Insurance Company. *Advances in Intelligent Systems and Computing*, 908, 669-677. https://doi.org/10.1007/978-3-030-11367-4_64
22. Khominich, I., & Savina, O. (2020). O regulirovani riskov tsifrovizatsii finansovoy industrii [On Managing the Risks of Digitalization of Financial Industry]. *Problemy teorii i praktiki upravleniya – Problems of Management Theory and Practice*, 10, 150-160. (In Russian). <https://doi.org/10.46486/0234-4505-2020-10-150-160>
23. Khuzhamov, L. T., & Koshkin, D. S. (2020). Sozdaniye ekosistem – napravleniye razvitiya strakhovaniya v epokhu tsifrovizatsii [Creating ecosystems – the direction of insurance development in the era of digitalization]. *Upravleniye riskom – Risk management*, 2, 53-58. (In Russian).
24. KMPG. (2019). *Obzor rossiyskogo rynka strakhovaniya za 2019 god [Overview of the Russian insurance market for 2019]*. (In Russian). Retrieved from <https://home.kpmg/ru/ru/home/insights/2019/07/insurance-survey-2019.html>
25. KMPG. (2020). *Obzor rossiyskogo rynka strakhovaniya za 2020 god [Overview of the Russian insurance market for 2020]*. (In Russian). Retrieved from <https://home.kpmg/ru/ru/home/insights/2020/08/insurance-survey-2020.html>
26. Levina, E., Pyrkova, G., Zakirova, C., Semikova, O. R., Nabiullina, K. R., Ishmuradova, I. I., & Yakovlev, S. A. (2015). Socio-economic systems strategic development managing. *Journal of Sustainable Development*, 8(6), 76-82. <https://doi.org/10.5539/jsd.v8n6p76>
27. Lisowski, J., & Chojan, A. (2020). The use of innovations in insurance: Case of trade credit insurance. In *Innovation in Financial Services: Balancing Public and Private Interests* (pp. 232-245). London. Retrieved from <https://www.taylorfrancis.com/chapters/use-innovations-insurance-jacek-lisowski-anna-chojan/e/10.4324/9781003051664-17>
28. Loi, M., Hauser, C., & Christen, M. (2020). Highway to (Digital) Surveillance: When Are Clients Coerced to Share Their Data with Insurers? *Journal of Business Ethics*. <https://doi.org/10.1007/s10551-020-04668-1>
29. Mustafina, A., Kaigorodova, G., Alyakina, P., Velichko, N., & Zainullina, M. (2020). Digital technology in insurance. *Advances in Intelligent Systems and Computing*, 908, 678-685. https://doi.org/10.1007/978-3-030-11367-4_65
30. Pettersson, D., Lilliesköld, J., Händel, P., & Agerman, J. (2019). Usage-Based Auto Insurance on the Swedish Market: A Case Study. 2019 *Portland International Conference on Management of Engineering and Technology (PICMET)*. Portland, OR, USA. <https://doi.org/10.23919/PICMET.2019.8893870>
31. Petukhova, D., Shevchenko, N., & Osipova, E. (2018). Innovatsii i IT-tehnologii v meditsinskom strakhovanii [Innovations and IT technologies in copper-zinc insurance]. *Transportnoye delo Rossii – Transport business of Russia*, 6, 83-84. (In Russian).
32. Plonka, M., Jedynak, T., & Trynchuk, V. (2020). Retirement behavior strategies: the attitudes of students from Poland and Ukraine towards the old-age risk. *Problems and Perspectives in Management*, 18(2), 350-365. [https://doi.org/10.21511/ppm.18\(2\).2020.29](https://doi.org/10.21511/ppm.18(2).2020.29)
33. Polinkevych, O. (2016).

- Methodical approaches to expert selection for evaluation of enterprise innovative development. *Actual Problems of Economics*, 176(2), 421-428.
34. Polinkevych, O., Khovrak, I., Trynchuk, V., Klapkiv, Y., & Volynets, I. (2021). Business Risk Management in Times of Crises and Pandemics. *Montenegrin Journal of Economics*, 17(3), 117-128.
 35. Pooser, D., Browne, M., & Arkhangelska, O. (2018). Growth in the Perception of Cyber Risk: Evidence from U.S. P&C Insurers. *The Geneva Papers on Risk and Insurance – Issues and Practice volume*, 43(2), 208-223. <https://doi.org/10.1057/s41288-017-0077-9>
 36. Porrini, D. (2017). Regulating Big Data effects in the European insurance market. *Insurance Markets and Companies*, 8(1), 6-15. [https://doi.org/10.21511/ins.08\(1\).2017.01](https://doi.org/10.21511/ins.08(1).2017.01)
 37. Pukala, R., Hlibko, S., Vnukova, N., & Davidenko, D. (2019). Usage of E-Technologies to Enhance Infocommunication in Financing Innovation. *2019 IEEE International Scientific-Practical Conference Problems of Infocommunications, Science and Technology (PIC SeT)* (pp. 157-160). Kyiv, Ukraine. <https://doi.org/10.1109/PIC-ST47496.2019.9061571>
 38. Röschmann, A. (2018). Digital insurance brokers – old wine in new bottles? How digital brokers create value. *Zeitschrift für die gesamte Versicherungswissenschaft*, 107(6), 273-291. <https://doi.org/10.1007/s12297-018-0413-6>
 39. Sembekov, A. (2020). Strakhovoy rynek Kazakhstana i sovremennyye vyzovy [Insurance market of Kazakhstan and modern challenges]. *Ekonomicheskaya seriya Vestnika YENU imeni L. N. Gumileva – Economic series of the Bulletin of the YeNU named after L. N. Gumilev*, 2, 147-159. (In Russian).
 40. Stepanova, M. (2020). Current Trends of Digitalization in the Field of Insurance Services. *Global & Regional Research*, 2(1), 230-234. (In Russian). Retrieved from <http://sgal.bgu.ru/pub.aspx?id=25688>
 41. Trunina, I., Khovrak I., & Sushchenko S. (2019). Big Data in Sustainable Regional Development: The Digital Future of Smart Regions. *International Journal of 3D Printing Technologies and Digital Industry*, 3(2), 116-123.
 42. Tsyganov, A., & Bryzgalov, D. (2018). Digitalization of the insurance market: tasks, problems and prospects. *Ekonomika i upravleniye – Economics and management*, 2, 111-120. (In Russian). Retrieved from <https://cyberleninka.ru/article/n/tsifrovizatsiya-strahovogo-rynka-zadachi-problemy-i-perspektivy/viewer>
 43. Vinogradova, E., Tsvetkova, L., & Orlaniuk-Malitskaia, L. (2019). Development of the risk insurance zone for high-tech enterprises. *International Journal of Management and Business Research*, 9(2), 138-148. Retrieved from <http://converis.misis.ru/converis/portal/Publication/10550421>
 44. Werth, O., Schwarzbach, C., Cardona, D., Breitner, M., & Schulenburg, J. (2020). Influencing factors for the digital transformation in the financial services sector. *Zeitschrift für die gesamte Versicherungswissenschaft*, 109(1). <https://doi.org/10.1007/s12297-020-00486-6>
 45. Zhabynets, O. (2014). Data protection and information security of insurance companies. *Economic Annals-XXI*, 7-8(2), 32-35. (In Ukrainian). Retrieved from https://www.researchgate.net/publication/297702191_Data_protection_and_information_security_of_insurance_companies