Description and Analysis of Economic Efficiency of the Real Estate Model Transformed in the Framework of Digitalization

Nikolay Lavrov¹*, Andrey Druzhinin² and Natalia Alekseeva²

¹Ltd. «St. Petersburg Real Estate Group»», St. Petersburg, Russian Federation
²Peter the Great St. Petersburg Polytechnic University (SPbPU), St. Petersburg, Russian Federation

*E-mail: lavrov_nb@list.ru

Abstract Today, digital technologies are increasingly becoming an integral part of our life. In business, they help to improve the efficiency of current business processes by creating new business models and more ways to attract customers. The purpose of the study is to describe the real estate model transformed under digitalization and analyse its economic efficiency. The data was collected through personal interviews with executive managers of real estate companies in Russia. The paper describes a new real estate model that reduces dependence of real estate agencies on agents. Its establishment was made possible due to the emergence of digital technologies and digital tools and their introduction into our everyday life as well as the business sector. The paper also presents stages of work in a real estate agency, defines parties responsible for each stage and lists digital technologies and tools. Moreover, in the paper, the new business model is compared to the classical one based on their characteristics. Some preconditions for the new model are determined, and its flaws are described. Social consequences of innovations in the real estate sector are defined. The economic efficiency of the model is calculated and used as an indicator of its high potential capacity for real estate. The paper might be useful for real estate entrepreneurs or other businesses with great dependence on key personnel responsible for interacting with customers.

1. Introduction
Today, digital technologies are increasingly becoming an integral part of our everyday life and business [1]. In particular, in business, they change personnel training procedures [2] and help to improve the efficiency of current business processes by creating new business models and more ways to attract customers [3,4]. Changes occur in processes of delivering food to residents of metropolises, interacting with executive authorities, ordering tickets and booking hotels, in the garment [5],
automotive [6], energy [7] and banking [8] sectors and many other industries. The real estate sector is also experiencing some changes due to the emergence and development of digital technologies [9,10].

The classical real estate model is based on the interaction of a full-service real estate agent with a property seller or a buyer; the model is described in [11]. A full-service agent is involved in every stage of work, from looking for a client to preparing a transfer deed after a successful deal (Figure 1). In other words, only one real estate agent interacts with a client during the whole service provision cycle; the agent works on a commission basis [12]. Such a scheme has been implemented in Russia since the transition to the market economy in early 1990s. Its key feature is that a real estate agent basically acts as a sole proprietor that receives access to an office in a real estate agency, where they can meet clients, organize negotiations, keep documents, etc. In return for a comfortable working environment an agent pays a part of their income to the agency. In this situation, clients develop loyalty to an agent and not to the agency. Therefore, an agency that is dependent on its agents and their commitment faces great income risks; the statement is also supported by the following experts [12].

Some believe the classical model is hardly beneficial both to sellers [13] and even agents [14]. In many cases, proposals to change it [15,16] are accompanied by financial performance analyses [17,18]. Some authors [13] argue that the commission fee of real estate agents is unreasonably high, others [14] claim that agents receive less when working in a classical real estate agency. The paper [15] suggests clients performing some of an agent’s responsibilities with the help of online services; according to the authors, it might result in greater accountability of real estate agents. Correlation between the number of employees in an agency and its income is studied in the paper [16].

The establishment of a new real estate model with a reduced dependence of agencies on agents has been made possible due to the emergence and introduction of digital technologies and tools. For example, the possibility of implementing digital technologies into a real estate business is studied in [15]. The model proposed in the present paper is currently at the stage of implementation, finalization and evaluation by a number of Russian real estate agencies, which accounts for the novelty of the study.

Some of the ideas presented in works [19,20] were used as a basis for the model. In particular, the paper [19] proposes to delegate the responsibility of showing properties to a special department of real estate employees. In the present model, this idea is explored further, as a real estate agency is divided into four departments. The authors [19] conclude that such a division of labour has a positive impact on the price of a property but does not affect its marketing period. The paper [20] focuses on the issue of wage distribution among agents working with the same property but performing different tasks in the course of selling the mentioned property. The paper states that some problems with distributing the received commission among agents arise due to unclear division of responsibilities. The proposed solutions to these problems are based on internal contracts between agents.

Successful implementation of the new model presented in the paper might be able to change a profile of a typical real estate agent, reduce risks for agencies and improve their overall management, as well as change the attitude of consumers to the quality of services provided. On a more global scale, it might introduce a new business model into those industries that greatly depend on their key personnel responsible for interacting with clients.

The authors believe that the transformation of small businesses, including real estate ones, in the framework of economy digitalization is unreasonably understudied, as it is small businesses that provide new business approaches and models due to the fact that they have to face tough competition of the external environment. The statement determines the rationale of the research.

The purpose of the study is to describe the real estate model transformed under digitalization and analyse its economic efficiency. Thus, the following objectives need to be achieved:

- to present stages of work in a real estate agency and define parties responsible for each stage as well as digital technologies and tools implemented,
- to compare the classical model and the new model based on their characteristics,
• to describe preconditions for the new model, determine its flaws, indicate social consequences of its implementation and analyse its economic efficiency.

2. Research Methods
The main methods are observation, fact-finding, abstraction and logical methods. The data was collected through personal interviews with executive managers of real estate companies in Russia. The interviews were held in July of 2018 and 2019. The research focuses on the sale of apartments as one of the services provided by real estate agencies. The study includes analyses of qualitative and quantitative data, which is applied in calculation of economic efficiency indicators. Return on sales, return on labour and return on the invested capital are used as indicators of economic efficiency.

\[
\text{ROS} = \frac{\text{net income}}{\text{sales}} \times 100\% \quad (1)
\]

\[
\text{ROL} = \frac{\text{labour costs}}{\text{net income}} \times 100\% \quad (2)
\]

\[
\text{ROIC} = \frac{\text{invested capital}}{\text{net income}} \times 100\% \quad (3)
\]

ROS – return on sales
ROL – return on labour
ROIC – return on invested capital
net income – gross annual income of an agency minus taxes
sales – annual revenue of an agency
labour costs – annual cost of wages paid to agents/department employees
invested capital – initial funds invested in a business

Due to the fact that it is common for the Russian real estate industry to invest own funds into starting and running a business, the invested funds indicator considers one’s own funds only; debt servicing costs are not included in the calculation.

3. Findings
Based on the analysis of interviews with real estate experts, some stages of work with a client were determined. Among them, those stages that are performed by different departments of a real estate agency in the framework of the proposed business model (Figure 1) were identified. Figure 1 shows 13 stages of selling an apartment service provision executed by all real estate agencies regardless of their implemented business model. In the classical business model, each stage is performed by one full-service agent. In the present model, different departments are responsible for the realization of different stages. Figure 1 demonstrates the stages classified into four groups according to the number of departments.
Figure 1. Stages of work with a client when providing the sale of an apartment service
Source: produced by the authors

Table 1 compares some performance characteristics of the classical business model and the proposed model based on digital technologies.

Table 1. Comparison of performance characteristics of the studied models implemented in real estate agencies

| Characteristics                      | The classical model                                                                 | The proposed model                                                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Personnel of an agency               | A full-service agent                                                                | Employees of the departments                                                        |
| The business model of an agency      | One full-service agent is responsible for the realization of all stages of a purchase and sale deal. | Every stage of a purchase and sale deal is realized by different employees.          |
## continuation of Table 1

| Training period          | Long     | Reduced |
|--------------------------|----------|---------|
| Waiting period before the first income of an employee | Long     | Reduced |
| The age of an employee   | On average aged 35 and over | On average aged 20 and over |
| Clients are loyal to     | the agent | the agency |
| Interacts with clients   | the agent | the agency |
| The nature of an employee’s work | Independent | Collaborative |
| The number of properties dealt with simultaneously | 1-10 | 20-30 |
| The average number of deals | One deal every two months for one agent | 3-4 deals a month for a department with one telemarketer |

| Staff turnover           | Average        | High |
|--------------------------|----------------|-----|
| The necessity to describe the process in detail to responsible parties | Low | High |
| The nature of a department manager’s work | Setting one objective and encouraging its achievement | Setting multiple objectives and controlling their achievements |
| The possibility to standardize the training system | Low | High |
| Efficiency of scripts, checklists, etc. | Average | High |
| Dependence of an agency on an employee | High | Low |
| Dependence of an employee on an agency | Low | High |
| The possibility for an employee to work without an agency | High | Not possible |
| The level of fixed costs | Average | High |
| The level of initial investments | Average | High |
| Dependence on marketing tools | Average | High |
| Administrative and management staff | Administrator, accountant, manager, department manager | Administrator, accountant, manager, department manager, telemarketer, personnel officer, in-house counsel, one department manager for each department |

| The need for the Personnel Department | Low | High |
|---------------------------------------|-----|-----|
| The need to monitor the execution of work managers | Low | High |
| Dependence on department managers     | Low | High |

Source: produced by the authors

The real estate models described above were analysed on the basis of their economic efficiency on the example a hypothetical real estate agency. In order to provide comparable values, the analysis considers an equal quantity of deals per year. Table 2 demonstrates the findings.
Table 2. Performance of a hypothetical real estate agency with implementation of the analysed models

| The number of deals per year | The classical model | The proposed model |
|-----------------------------|--------------------|--------------------|
| 100                         | 100                |

| The average commission fee on one deal, in rubles | 200,000 | 200,000 |
|-------------------------------------------------|---------|---------|
| The share of an agency in the commission fee | 0.4     | 1.0     |
| Revenue of an agency, rubles per year | 8,000,000 | 20,000,000 |
| Expenses, rubles per year | 6,440,000 | 15,772,000 |
| Office rental and utility bills | 1,200,000 | 1,200,000 |
| Office expenses and supplies | 360,000 | 360,000 |
| Expenses of Department 1 | - | 420,000 |
| Expenses of Department 2 | - | 1,600,000 |
| Expenses of Department 3 | - | 2,000,000 |
| Expenses of Department 4 | - | 4,000,000 |
| Administrative personnel cost | 960,000 | 1,920,000 |
| Advertising | 1,680,000 | 1,680,000 |
| Taxes | 2,000,000 | 2,352,000 |
| Other | 240,000 | 240,000 |
| Income, rubles per year | 1,560,000 | 4,228,000 |
| Labour costs of agents/department employees, rubles per year | 12,000,000 | 8,020,000 |
| Expert estimation of initial funds invested in a business | 4,000,000 | 6,000,000 |
| Return on sales (ROS) % | 20 | 21 |
| Return on labour (ROL) % | 13 | 53 |
| Return on invested capital (ROIC) % | 39 | 70 |

Source: produced by the authors

4. Discussion

The data was collected through personal interviews with executive managers of real estate companies in Russia: Yana A. Lurje, the owner of the closed real estate database SLON; Irina T. Gudkina, the founder of the transregional partner network «Pereezzhaem v Peterburg» and the former director of the largest real estate agency Becar; Andrej A. Tetysh, the president of a group of companies «Agentstvo Razvitiya i Issledovaniya v Nedvizhimosti»; Sergej V. Vlasenko, the CEO of the real estate agency «Megapolis-Servis», Aleksandr Yu. Romanenko, the president of a group of the Advecs real estate agencies.

The emergence of digital technologies has changed the classical real estate business model. Now, the stages of selling an apartment can be performed not by one agent, but by numerous agents working in different departments (Figure 1).

Department 1 is responsible for looking for clients, or individuals wishing to sell their property. The employees are telemarketers, whose job is looking for clients, contacting potential clients via phone calls and scheduling in-person meetings at the property site. When a meeting is scheduled, it is entered in an electronic organizer; an employee from Department 2 is assigned to come to the meeting.
A telemarketer makes about 30-50 calls a day, while a full-service agent is capable of making no more than 10 cold calls a day. There are two factors that contribute to the increased productivity: 1) a telemarketer has more limited responsibilities compared to a full-service agent, thereby having more time to make phone calls; 2) a telemarketer’s motivation is not subjected to reduction if they do not like a client or if a property is located in a personally undesirable area as they are not responsible for meeting a client or visiting a property. The following digital technologies and tools are used in the model: open and closed electronic property databases, electronic listings, social networks, a CRM system for real estate agencies, IP telephony, and the Internet. According to the data provided by the ARIN real estate agency, one telemarketer can provide four Department 2 employees with fully booked schedules.

Department 2 is responsible for signing a service provision agreement with a potential client. The employee’s job is to visit the property site in person and meet a potential client. The applied digital technologies and tools are a CRM system for real estate agencies, a digital camera, an e-mail and instant messengers, electronic documents, and mobile gadgets with Internet access. The ARIN data shows that four Department 2 employees are capable of providing five Department 3 employees with service provision agreements. Department 2 employees also demonstrate higher productivity at this stage of work than a full-service agent. A Department 2 employee is motivated to provide a more professional service to clients as their income fully depends on the number of service provision agreements signed, while a full-service agent only receives a commission fee once a full set of selling services is successfully complete.

After signing a service provision agreement, Department 3 employees continue to work with a client. Their responsibilities include presenting weekly reports on the number of calls regarding the property, searching for information on competitive properties, conducting marketing research on the property, changing photos and the description of the property, interacting with potential buyers and showing them the property. According to the data provided by agencies that use the division into departments scheme, allocating specific responsibilities to different employees increases their productivity due to their more confined area of specialization. The implemented digital technologies and tools are MS Word, MS PowerPoint, Acrobat Reader, Canva for weekly reports; an e-mail and messengers for contacting a client, a CRM system for real estate agencies, open and closed electronic property databases, IP telephony, and the Internet.

Department 4 is responsible for providing the transaction support from signing a purchase and a sale agreement to signing a transfer deed. The digital technologies and tools used in the work are online document request services, online services for scheduling an appointment for transaction registration and submitting registration documents, a CRM system for real estate agencies, an e-mail and instant messengers, electronic documents, and mobile gadgets with Internet access. The ARIN data shows that five Department 2 employees are capable of providing three Department 4 employees with work.

Thus, the new real estate business model is characterized by cooperation between employees of four different departments performing specific tasks assigned to them, while a full-service agent is responsible for completing all of them. The model allows an agency to employ younger and less experienced professionals. However, it also demands greater expenditures related to recruiting, hiring, training and managing the personnel, which contributes to a higher level of fixed costs and initial investments.

The introduction of a model based on the division of a full-service agent’s responsibilities among different departments was made possible a few years ago due to the emergence of digital tools providing companies with significant improvement of internal communication. In particular, a CRM system can be considered to be a good example of such tools. It helps to collect and redistribute all information sent by potential and current clients and employees. The quality and speed of communications have seen remarkable improvement due to the emergence of mobile communication devices, such as smartphones and tablets, a better accessibility of high-quality Internet connection, and the introduction of instant messengers and programs for processing, storing and providing data. The
development of new skills by employees forced by the emergence of digital technologies and tools, an increased speed of information exchange, larger amounts of information, clients` stricter standards for the quality of information provided, its volume and speed of reaction to external and internal changes have acted as preconditions for division of a full-service agent`s responsibilities among employees of different departments.

The necessity to meet clients` requirements in a highly competitive market has resulted in a new real estate model described above. An analysis of economic efficiency indicators (Table 2) proves its financial efficiency. Despite the overall increase in the level of costs in 2.4 times, a real estate agency can increase its revenue in 2.5 times and its income in 2.7 times. Although the return on sales grows only by 1%, the return on labour shows the increase from 13% to 53%, and the return on the invested capital is from 39% to 70%. Thus, the return on funds invested in starting a real estate agency can be decreased from 2.6 years to 1.4 years, with no inflation included. A significantly lower risk of losing a client base due to the departure of an agent is another important advantage of the model. A more detailed analysis on the efficiency of the new model taking into consideration changes in risks will be attempted in further studies with the use of Monte Carlo method [21].

Some disadvantages of the model include higher staff turnover, the need for more non-operational personnel, greater training costs, stronger dependence on department managers, and clients` lack of experience of interacting with multiple real estate employees in the course of one deal. The latter can be eliminated, if the agency is working according to the classical and the new business models simultaneously. It can be achieved through the creation of two legal entities under the same brand.

Social consequences of the division of responsibilities into stages performed by different departments include more labour forces being employed by a real estate agency. In comparison with a typical profile of a real estate agent, which is a man or a woman aged 35 and over, under the new model Departments 2 and 3 can have employees aged 20 and over. The division of responsibilities into stages performed by different departments allows new employees to earn their first income in a shorter period, which has a positive impact on their making real estate their career. Broader job descriptions are another positive consequence of dividing responsibilities among different departments and employees.

5. Conclusion

1. The paper focuses on a new real estate business model developed in the framework of digitalization of society and business. The model consists of the same stages that a full-service agent has to perform, however, due to the division of the stages among different employees it is possible to improve the overall quality of the work. The paper also determines stages of work with a client when providing the sale of an apartment service. The stages are classified into four groups according to the number of departments responsible for their performance. Group 1 stages consider looking for potential clients. Group 2 stages include visiting the property and signing a service provision agreement. Group 3 stages involve advertising of properties, organizing viewing of properties, working with target buyers, and registering a deposit or an advance payment. During Group 4 stages, a purchase and a sale contract is signed, a deal is registered, preliminary and final calculations regarding the deal are made, sellers are removed from registers, and a purchase and sale deed is signed.

   Group 1 stages are performed by telemarketers working in Department 1 with the use of the following digital technologies and tools: open and closed electronic property databases, electronic listings, social networks, a CRM system for real estate agencies, IP telephony, and the Internet. Department 2 employees are responsible for Group 2 stages. They visit the property site and meet potential clients in person. The applied digital technologies and tools are a CRM system for real estate agencies, a digital camera, an e-mail and instant messengers, electronic documents, and mobile gadgets with Internet access. Group 3 stages are completed by Department 3 employees, which use such digital technologies and tools as MS Word, MS PowerPoint, Acrobat Reader, Canva for weekly reports; an e-mail and messengers for contacting a client, a CRM system for real estate agencies, open and closed electronic property databases, IP telephony, and the Internet. Department 4 employees are
involved in Group 4 stages. In their work they use such digital technologies and tools as online
document request services, online services for scheduling an appointment for transaction registration
and submitting registration documents, a CRM system for real estate agencies, an e-mail and instant
messengers, electronic documents, and mobile gadgets with Internet access.

2. One of the primary features of the model is that it introduces division of selling a property
service, previously performed by a single full-service agent, into parts now realized by different
departments. The new model reduces the training period of recently recruited employees and their
waiting period before the first income. Moreover, it lowers the age limit for employees. The nature of
work changes from independent into collaborative, which has a positive impact on the number of
properties dealt with simultaneously. A significantly lower risk of losing a client base due to the
departure of an agent is another important advantage of the model. This risk is named among the most
dangerous in real estate; however, the change from the independent into collaborative nature of work
reduces it remarkably. Compared to the classical real estate business model, the proposed model
demands higher fixed costs and more initial funds invested in a business. Moreover, it requires more
marketing tools, more administrative and management staff, including the Personnel Department, and
increases the dependence on department managers.

3. The development of digital technologies has resulted in a better quality of communications,
while a higher speed of information exchange and greater amounts of information in a highly
competitive real estate market have contributed to establishment of a new real estate business model
being its preconditions. The most serious disadvantages of the model are higher staff turnover, the
need for more non-operational personnel, greater training costs, and a higher level of fixed costs.
Social consequences of responsibility division into stages performed by different departments include
recruitment of younger employees and broader job descriptions.

Despite the overall increase in the level of costs, implementation of the proposed model has
increased the revenue 2.5 times and the income 2.7 times. The conducted analysis shows that,
although the return on sales grows only by 1%, the return on labour shows the increase from 13% to
53%, and the return on the invested capital - from 39% to 70%. Thus, the return on funds invested in
starting of a real estate agency can be decreased from 2.6 years to 1.4 years, with no inflation
included.

References
[1] Bataev A V 2018 Analysis and development the digital economy in the world. Proc. of the 31st
Int. Business Information Management Association Conf. (IBIMA’18) (Milan Italy) 61–71
[2] Kuladzhi T V, Babkin A V and Murtazaev S-A Yu 2017 Enhancing personnel training for the
industrial and economic complex in the conditions of the digital economy Proc. of 2017 IEEE
6th Forum Strategic Partnership of Universities and Enterprises of Hi-Tech Branches
(Science. Education. Innovations), SPUE 2017 67-70 DOI: 10.1109/IVForum.2017.8246053
[3] Bataev A V, Gorovoy A A and Mottaeva A 2018 Evaluation of the future development of the
digital economy in Russia. Proc.s of the 32nd Int. Business Information Management
Association Conf. (IBIMA’18) (Seville Spain) 88–101
[4] Galimova M, Gileva T, Mukhanova N and Krasnuk L 2019 Selecting the path of the digital
transformation of business-models for industrial enterprises Proc. of the IOP Conference
Series: Materials Science and Engineering (Saint-Petersburg Russian Federation) 497(1)
012071 DOI: 10.1088/1757-899X/497/1/012071
[5] Kornilova N L, Salkutsan S V, Bolsunovskaya M V, Gorelova A E and Vasiliev D A 2018
Some aspects of PLM-systems for creating digital factories in the garment industry Izvestiya
Vysshikh Uchebnykh Zavedenii, Seriya Tekhnologiya Tekstil'noi Promyshlennosti 2018-January
4 103-103
[6] Gromova E A 2019 Digital economy development with an emphasis on automotive industry in
Russia Espacios 10 6
[7] Alekseeva N and Stroganova O 2019 Prospects in managing the distribution and use of energy
[8] Bataev A V and Plotnikova E V 2019 Assessment of digital banks’ performance Espacios 40 20

[9] Babatunde T O and Ajayi C A 2018 The impact of information and communication technology on real estate agency in Lagos Metropolis, Nigeria. Property Management 36 2 173–185 DOI: 10.1108/PM-10-2016-0057

[10] Sun Y and Ifeanyi O 2015 A qualitative study of e-business adoption in the real estate sector in China Journal of Internet Banking and Commerce 20 1–10

[11] Palmon O and Sopranzetti Ben J 2017 On the relationship between the number of a broker’s real estate listings and transaction outcomes Review of Quantitative Finance and Accounting 49 1 65–89

[12] Zhang Y and Zhang, H 2014 An Experimental Comparison of Commission Patterns in the Resale Housing Market in China Journal of Comparative Asian Development 13 3 436–463

[13] Bernheim D B and Meer J 2013 Do real estate brokers add value when listing services are unbundled? Economic Inquiry 51 2 1166–1182

[14] Benefield J D, Sirmans C S and Sirmans G S 2019 Observable agent effort and limits to innovation in residential real estate Journal of Real Estate Research 41 1–36

[15] Wang G K and Yang J 2017 Will a fixed-rate commission contract continue to prevail? Journal of Real Estate Research 39 4 537–566

[16] Li L and Yavas A 2015 The Impact of a Multiple Listing Service Real Estate Economics 43 2 471–506

[17] Gholipour H F and Razali M N 2017 Determinants of financial performance of real estate brokerage industry in Iran International Journal of Housing Markets and Analysis 10 4 489–502

[18] Devaney S, Livingstone N, McAllister P and Nanda A 2017 Institutional convergence in Real Estate Markets: A comparative study of brokerage models and transaction costs Journal of Real Estate Literature 25 1 169–188

[19] Allen M T and Benefield J D 2012 Technology in residential brokerage: Showing appointment scheduling services, property prices, and marketing times JREPE 15 1–17

[20] Bian X, Waller B D and Yavas A 2017 Commission Splits in Real Estate Transactions Journal of Real Estate Finance and Economics 54 2 165–187

[21] Alekseeva N, Antonshkova N and Pupentsova S 2019 Application of the Monte-Carlo Simulation Method in Building and Energy Management Systems Proc. of the Int. Scientific Conf. Energy Management of Municipal Facilities and Sustainable Energy Technologies (EMMFT-2018) Advances in Intelligent Systems and Computing (Samara, Russian Federation) 983 257–266 DOI:https://doi.org/10.1007/978-3-030-19868-8_26