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UDK 72.726 (470.316)

Stages of the Formation of the Sophia Monastery in Rybinsk of the Yaroslavl Province

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Key words and phrases: architecture of Rybinsk; monasteries of the Yaroslavl; St. Sophia monastery; province.

Abstract. The aim of the work is to identify the stages of the formation of the architectural ensemble of the Sophia Monastery in Rybinsk. The main tasks include the study of literary, archival and cartographic sources in order to accurately determine the dates of the demolition and reconstruction of the buildings of the monastery complex. The paper formulates a hypothesis about the stages of carrying out the historical-town-planning and historical-architectural analysis, as well as the development of the protection of monastery buildings. The theoretical research methods of collection, research, study, generalization of archival and historical information, as well as graphic and photographic materials; comparative analysis of the identified stages of the formation of the monastery were used. As a result of the study of the Sophia Monastery in Rybinsk, five main stages of its formation were identified: Stage 1 (1860–1862) – primary wood and stone construction; Stage 2 (1863–1878) – continuation of stone construction, formation of a square; Stage 3 (1879–1917) – new construction, reconstruction of buildings, completion of the formation of the monastery ensemble; Stage 4 (1918–2008) – placement of a children's colony – an NKVD prison – a pre-trial detention center, the destruction of monastery buildings, the inclusion of new, discordant buildings, the loss of the historical boundaries of the monastery territory; Stage 5 (2009 – present) – the revival of the monastery, restoration work.

The Sophia Monastery is located on the right bank of the Korovka River, high with a steep slope (the old names of the river are the Kormitsa River or the Mitsa River) at the confluence of the Gremyachy Brook into the Korovka River, three versts from the city of Rybinsk [11]. The monastery was closed at the beginning of the 20th century, many buildings were partially or completely lost, new, discordant buildings were located on the territory of the monastery (at the moment the monastery is located in pretrial detention center-2, and after the revolution a

children's colony was located, then the NKVD prison), but in 2010s, the gradual transfer of the monastery buildings to the church and work on their restoration began.

The purpose of the paper is to identify the stages of the formation of the architectural ensemble of the Sophia Monastery in Rybinsk.

In order to conduct a historical-town-planning and historical-architectural analysis, as well as to develop measures for the restoration and protection of monastic buildings, it is necessary to study the formation of a monastery at every stage of its development.

Most of the published works present information about the architecture of the monastery of an introductory nature, or an analysis of the collected archival church inventories and historical photos. However, despite the sufficient completeness and depth of elaboration, these descriptions do not give a complete picture of the formation and development of the structure of the monastery ensemble from the moment of its foundation to the present time [1–3; 5–13].

The study was carried out on the basis of archival materials, published literary sources, historical iconography (archival design and fixation drawings, planography, and photographs), and field examination. In the course of the work, the following theoretical research methods were used – collection, research, study, generalization of archival and historical references, as well as graphic and photographic materials; a comparative analysis of the identified stages of the formation of the monastery was carried out.

Stage 1 (1860–1862) – primary wood and stone construction

During the first phase of construction, which lasted from 11860 to 1862, the primary timber and stone structures were erected. The territory of the monastery was fenced in with a square fence with towers. In the northeastern tower in 1860–1861, a stone church was laid in the name of the icon of the mother of God "Joy of All Who Sorrow". In 1861, the wooden Sophia church was hastily erected. In 1860, to the north of the monastic square along the Korovka River, two wooden outhouses for workers were built, and to the west of the square – a wooden house in the cemetery for Father Peter Tomanytsky. In 1862, active work began – two wooden buildings for builders and a stone cell building for sisters were built to the north of the southeastern tower along the perimeter of the monastery square. At the same time, a small brick factory was built nearby, consisting of two sheds and a furnace. In the same 1862, two wooden cell buildings for sisters were built along the northern part of the fence, and two wooden cell buildings on the western side, one of which is connected to the south-western tower.

According to the first approved sketch, the composition of the monastery has a clear symmetrical structure with a dominant temple in the center [4]. The buildings implemented at this stage differ from the approved draft design – two corner towers were rebuilt into a church. The cell buildings are built along the perimeter of the square and do not divide the central part into two courtyards, as it was in the project.

Stage 2 (1863–1878) – continuation of stone construction, formation of a square

The second stage of construction covers the period from 1863 to 1878. At this stage, a number of new buildings have been erected, but in general it is not as intensive as the previous one. In 1863–1871 the Savior Church [5] was rebuilt into a stone one. In 1874–1878, the reconstruction of the Sophia Cathedral from wooden to stone was carried out, with the replacement of the foundation. In 1866, a quarter of a mile from the monastery, two wooden plastered outbuildings were built.

Fig. 1. The northern facade of the Sophia Monastery in Rybinsk, late 19th – early 20th century

If we compare the ensemble that has developed at this stage with the approved draft design, you can find a number of deviations from the original design: The Holy Gates were moved to the east side; a bell tower was erected above the gate, which was not foreseen by the project.

Stage 3 (1879–1917) – new construction, reconstruction of buildings, and completion of the formation of the monastery ensemble

The third stage of construction is the final and very important in the formation of the ensemble (Fig. 1), thanks to the fruitful activity of Abbess Eugene, the period of her work, in addition to the construction of monastery buildings, transport infrastructure was established, a stone-paved road to the city was built, strong bridges were built, which was important for development monastery.

The Church of the Savior was dismantled in 1887 and rebuilt in 1898. The new white-stone Church of the Savior was built in the style of eclecticism with elements of classicism and was a two-story five-domed church with a gable roof. The pediments of the church are decorated with decorative kokoshniks, arched windows on the eastern façade are accentuated from above and below by profiled rods. The altar apse is rectangular in shape with a hip roof, at the level of the second floor of the apse there is a painting “The Savior Not Made by Hands”.

In 1897–1898, in the northeastern corner of the square, the temple “In the name of the Mother of God of Joy of All Who Sorrow” was dismantled and rebuilt in 1899–1902 into a more grandiose and large nine-domed church made of bricks in the pseudo-Russian style. The temple has four pillars, on a high plinth, with a large brick dome. The facades of the temple are richly decorated with belts of kokoshniks. At this stage, he pulled the center of the composition onto himself with volume and decor. Next to the temple, a two-story hospital building made of bricks with a gable roof is built, also in the pseudo-Russian style, with a more modest finish: the windows of the first floor are rectangular, on the second floor – arched with platbands in the form of kokoshniks, they are interconnected to the entire height of the facade of the building by

pilasters with coffered ornament.

Above the holy gates of the monastery, a tent-roofed bell tower was erected, which was an octagon on a four, on which a six was installed on top, completed with a pointed tent.

The eastern cell building was built according to the project of the provincial engineer Shishkin in 1882. The facades of the eastern building remained brick without finishing for a long time. Building with a high plinth finished with limestone. The facades of the building were decorated with double and triangular windows, decorated with triangular sandrids.

Two western cell buildings – stone, two-story, with a gable roof, arched windows. One of the buildings is aligned with the southwestern tower, which was probably originally round (the semicircle remained a protruding part).

The wooden two-storey building with a hip roof of the Bathhouse was built in 1888, 100 meters from the southeastern corner of the monastery square. The building was rebuilt in stone in 1903–1904, in the pseudo-Russian style.

The brick factory (stone) since 1889 consisted of residential buildings for workers, ancillary buildings and buildings with kilns.

Behind the fence of the monastery in 1889–1892, a stone church of the Holy Spirit was built in the cemetery.

On the north side of the monastery square, in 1917, a two-story wooden plaster cell building was built for the sisters.

In the center of Rybinsk, on Cathedral Square, a two-storey stone building in the pseudo-Russian style was built, which belongs to the monastery. The building on the second floor housed apartments for nuns serving two prosphora bakeries and a chapel on the first floor. At the moment, these premises are privately owned by various organizations.

Stage 4 (1918–2008) – placement of the children's colony-prison of the NKVD-SIZO, destruction of the monastery buildings, the inclusion of new, discordant buildings, the loss of the historical boundaries of the territory of the monastery

At this stage, many monastery buildings were partially or completely lost, and at the same time, many new discordant buildings appeared for the needs of the colony, the NKVD prison, and then the pre-trial detention center (Fig. 2).

In 1919, a colony for minors was opened in the Sofia monastery, and on November 28, 1923, the monastery was closed. In 1934, the NKVD prison was housed in the monastery, transformed into a pre-trial detention center SIZO-2, which is located on the territory of the monastery to this day.

St. Sophia Cathedral was dismantled into bricks – only the foundations and a small part of the altar apse with a window and a cast-iron lattice have survived. In 2011, on the site of the vestibule of the temple of St. Sophia Cathedral, the chapel of St. Anastasia the Pattern was built.

The abbot building was rebuilt for the needs of the colony in 1923. The Church of the Savior was rebuilt into a residential building in 1980. The eastern cell building inside was redesigned as a residential building and was partially lost, destroyed by an explosion in 1980. The building of the church in the name of the Mother of God "Joy of All Who Sorrow" was blown up, 4 pillars and a brick vault with a ring under the light drum for the central chapter survived.

Also in the second half of the XX century, dismantled and rebuilt: a brick factory; residential building for builders; the cast-iron fence of the monastery; the bell tower of the eastern building (dismantled in 1975); Church of the Mother of God "All Who Sorrow" (blown up in 1975); the western cell building (dismantled in 1975); wooden cell cases (dismantled in 1977); Church of

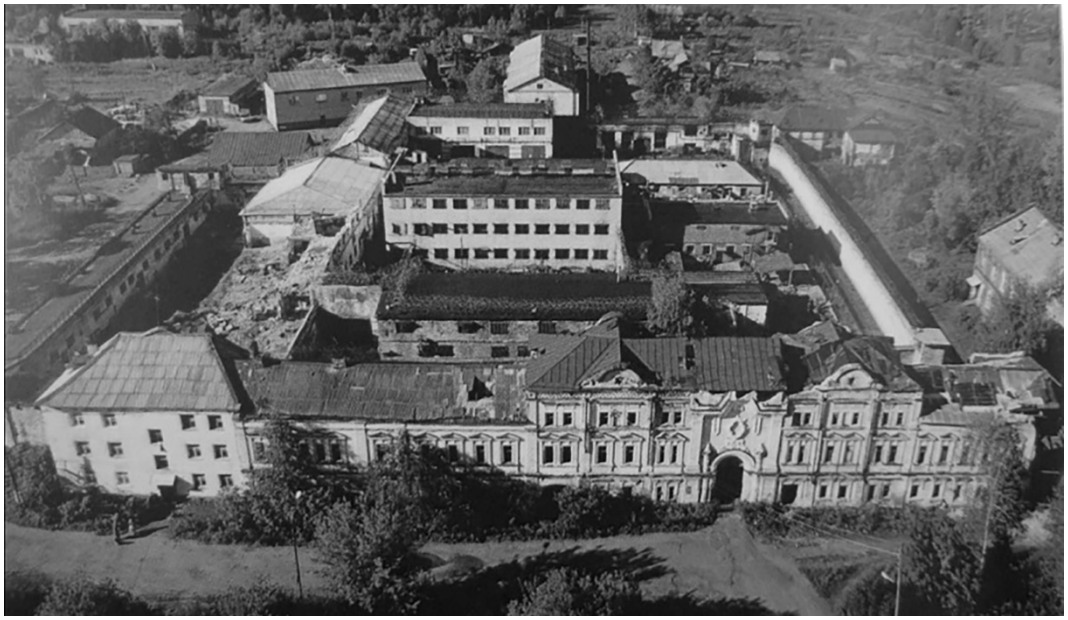

Fig. 2. Sophia Monastery in Rybinsk, present

the Holy Spirit in the cemetery (a residential building was built on the foundation of the church in 18980); a wooden house in the cemetery for Peter Tomanytsky's father (dismantled in 1980); an outbuilding for workers at a brick factory (dismantled in 1980); an outbuilding ¼ versts from the monastery (dismantled in 1980); abbot building, stone (rebuilt in 1998). The hospital building was dismantled in 2010.

Stage 5 (2009 – present) – revival of the monastery and restoration work

From 2009 to the present, work is underway to restore the monastery buildings. In 2009, the first work began to clear the territory and buildings that previously belonged to the monastery and were not occupied by the regional FSIN SIZO-2. In 2010, the debris of the church in the name of the icon of the Mother of God "Joy of All Who Sorrow" was cleared, trees and other vegetation were removed from the brick vault and domed space. In 2012, the restoration of the corner tower and the hull was completed. This building currently houses the abbot's chambers, a refectory and cells for sisters, on the second floor there is a house church in the name of the icon of the Mother of God "The Unbreakable Wall" (in 2018, a dome was installed over the temple). In 2020, work began on repairs and restoration of the roof of the eastern cell building.

As a result of the work done, five main stages of the formation of the Sophia Monastery in Rybinsk were revealed: Stage 1 (1860–1862) – primary wood and stone construction; Stage 2 (1863–1878) – continuation of stone construction, formation of a square; Stage 3 (1879–1917) – new construction, reconstruction of buildings, completion of the formation of the monastery ensemble; Stage 4 (1918–2008) – the placement of the children's colony-prison of the NKVD-SIZO, the destruction of the monastery buildings, the inclusion of new, discordant buildings, the loss of the historical boundaries of the monastery territory; Stage 5 (2009 – present) – the revival of the monastery, restoration work. The heyday of the monastery came in the third stage of development, when not only all the main historical buildings of the monastery were formed, but also the transport infrastructure connecting the monastery with the city was formed.

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Этапы формирования Софийского монастыря города Рыбинска Ярославской губернии

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Ключевые слова и фразы: архитектура Рыбинска; монастыри Ярославской губернии; Софийский монастырь.

Аннотация. Целью работы является выявление этапов формирования архитектурного ансамбля Софийского монастыря в г. Рыбинск. В основные задачи входит изучение литературных, архивных и картографических источников для точного определения дат сноса и перестройки зданий монастырского комплекса. В работе сформулирована гипотеза о

необходимости выявления этапов формирования монастыря для проведения историко-градостроительного и историко-архитектурного анализа, а также разработки мероприятий по охране монастырских построек. Использованы теоретические методы исследования – сбор, исследование, изучение, обобщение архивных и исторических справок, а также графических и фотоматериалов; сравнительный анализ выявленных этапов формирования монастыря. В результате работы по изучению Софийского монастыря в г. Рыбинск выявлено пять основных этапов его формирования: 1 этап (1860–1862 гг.) – первичное деревянное и каменное строительство; 2 этап (1863–1878 гг.) – продолжение каменного строительства, формирование каре; 3 этап (1879–1917 гг.) – новое строительство, реконструкция построек, завершение формирования ансамбля монастыря; 4 этап (1918–2008 гг.) – размещение детской колонии-тюрьмы НКВД-СИЗО, разрушение монастырских зданий, включение новых, диссонирующих строений, утрата исторических границ территории монастыря; 5 этап (2009 г. – настоящее время) – возрождение монастыря, реставрационные работы.

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Features of the Organization of Repair and Construction Works in Public Buildings in Conditions of Increasing Digitalization

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Key words and phrases: digitalization; public buildings; repair work.

Abstract. The purpose of the study is a generalized description of some of the features of the organization of repair and construction work in the context of the growing pace of digitalization and the development of the digital economy. To achieve the goal, information about residential and public buildings is provided that is significant from the point of view of the organization of work. Attention is paid to the analysis of such a concept as “digitalization” and the impact that digitalization can have on the organization of the repair and construction work. The result of the study is the formation of an idea about the features of repair and construction work in residential and public buildings, as well as the impact of digitalization on the effectiveness of their implementation.

Repair and construction work includes work on current or major repairs, as well as work during the reconstruction of a building.

In most scientific works related to the organization of repair and construction work in residential and public buildings, the authors do not make any differences in solving the problem, depending on the purpose of the building. However, there are some differences between these types of buildings. Residential buildings are intended for people whose stay is of a long-term nature. The stay of people in public buildings is associated with the implementation of any activity, which, as a rule, is of a short-term, rhythmic nature.

In accordance with article 166 of the Housing Code of the Russian Federation, major repairs in a residential building are allowed only in the common property [1]. Such jobs include the jobs listed in Table 1.

Repair and construction work in residential buildings is “narrower” than for public buildings. In residential buildings, many works are carried out by representatives of the management organization itself; in public buildings, a significant part of the work is carried out by specialized contractors [2–4]. In this case, t specialization of the contracting organization in certain types of public buildings plays an important role [5; 6].

Thus, from the point of view of carrying out repair and construction work within the framework of major repairs, public buildings have some features that distinguish them from residential

Table 1. The main types of work performed during the repair and construction work of residential buildings

№	Type of work
1	repair of in-house engineering systems for electricity, heating, gas, water supply, drainage
2	repair, replacement, modernization of elevators, repair of elevator shafts, machine rooms and block rooms
3	roof repair
4	repair of basements related to common property in an apartment building
5	facade renovation
6	repair of the foundation of an apartment building

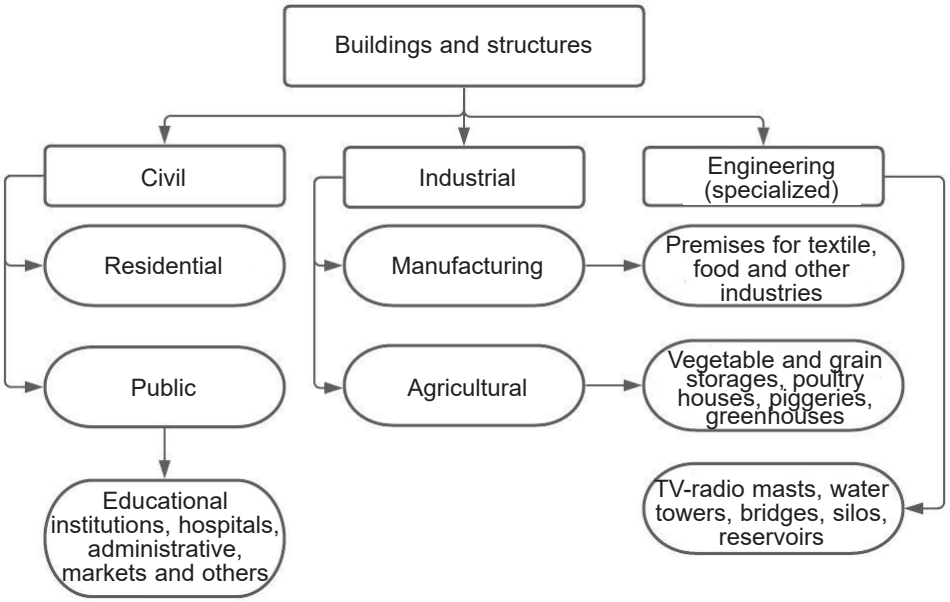

Fig. 1. Classification of residential and public buildings

buildings, which enables to consider this group of buildings separately and use new approaches to improve the efficiency of implementation of repair and construction work in public buildings.

In a number of sources [7; 8] one can find generalized classifications of residential and public buildings. An example of this kind of classification is shown in Fig. 1.

However, it should be noted that the group of public buildings itself is not homogeneous. It includes several main categories related to the purpose of public buildings: educational institutions, hospitals, kindergartens, administrative buildings, etc. In our opinion, each of these categories has some features that are important to consider when organizing repair and construction work in them.

For the most effective implementation of repair and construction work, it is proposed to use the classifier of public buildings developed within the framework of the study (Table 2), which allows to determine the most rational work based on the experience of carrying out repair and construction work in such buildings [9].

The classifier consists of two levels, which makes it is possible to carry out coding of the

Table 2. Classifier of public buildings

1st level classification	2nd level classification
1. The functional purpose	1.1. Academic
	1.2. Health care and recreation
	1.3. Physical culture and sports
	1.4. Cultural and educational
	1.5. Retail and services
	1.6. Administrative and office
	1.7. Multifunctional buildings, including premises of various types
2. The number of storeys	2.1. Low-rise (1-2 floors)
	2.2. Mid-rise (3-5 floors)
	2.3. Multi-storey (6-14 floors)
	2.4. High-rise (15 or more floors)
3. The layout of the premises in the building	3.1. Corridor
	3.2. Enfilade
	3.3. Centric
	3.4. Hall
	3.5. Combined
4. The materials of supporting structures	4.1. Stone
	4.2. Wooden
	4.3. Metallic
	4.4. Concrete / reinforced concrete
	4.5. Mixed type
5. The structural system	5.1. Wireframe
	5.2. Wall (frameless)
	5.3. Prefabricated form
	5.4. Frame-core
	5.5. Tube structure
	5.6. Combined

1	2	2	3	3	3	4	1	5	4

Fig. 2. Example of a public building classification code

building and in the future receive information about which work is most rational to carry out for a particular type of building. An example of building type coding is shown in Fig. 2.

The approach proposed by the authors to storing information about public buildings potentially subject to repair is a step towards the digitalization of information about repair objects. It is important to note that digitalization has recently had a significant impact on the development of

various sectors of the national economy, including construction. Unlike automation, digitalization can improve the efficiency of production processes through the use of digitized data.

Summing up, we can say with a high degree of confidence that the accumulation of important data and their high-quality processing within repair and construction organizations will increase their level of competitiveness and operational efficiency.

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Особенности организации ремонтно-строительных работ в общественных зданиях в условиях нарастающей цифровизации

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Ключевые слова и фразы: общественные здания; ремонтно-строительные работы; цифровизация.

Аннотация. Целью исследования, положенного в основу статьи, является обобщенное описание некоторых особенностей организации ремонтно-строительных работ (**РСР**)

в условиях нарастающих темпов цифровизации и развития цифровой экономики. Для достижения цели приводятся сведения о жилых и общественных зданиях, значимые с точки зрения организации работ. Уделено внимание анализу такого понятия, как «цифровизация» и тому влиянию, которое цифровизация может оказывать на организацию проведения РСР. Результатом проведенного исследования является формирование представления об особенностях проведения РСР в жилых и общественных зданиях, а также о влиянии цифровизации на эффективность их выполнения.

UDK 338

Macroeconomic Aspects of the Shadow Economy

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Key words and phrases: analysis of causes; features of development; macroeconomic aspects; shadow economy; shadow economy in Russia.

Abstract. In order to study the macroeconomic aspects of the shadow economy, the author presents an analysis of the causes, features of the development and nature of the shadow economy in Russia. Using the methods of economic analysis, expert assessments and historical analogy, a large array of data on the shadow economy in Russia has been studied. As a result of the work done, macroeconomic ways to combat the consequences of the shadow economy are proposed.

Absolutely every economic system in any country is a synthesis of legal and illegal economy. The illegal, hidden or shadow economy operates together with the legitimate economy and in certain countries is almost as large as it is.

The shadow economy is formed in parallel with the entire market system. There is an uncontrolled turnover of goods, services, and material values. The shadow economy is the socio-economic relations between individuals and social groups that are hidden from the state. The shadow economy also includes unrecorded, unregulated types of economic activity. The shadow economy, in addition to the market system, can also develop in a command economy, while its scale differs significantly.

The duality of the relationship between the shadow economy and the reproductive mechanism is expressed by the fact that, on the one hand, the shadow economic economy affects the formal macroeconomic mechanism, changing its development. However, on the opposite side, the shadow economy under specific conditions represents a cyclical reproduction mechanism with its own stages of “production-distribution-exchange-consumption”.

The shadow economy is present in almost all countries of the world, despite the political structure of the country, the standard of living of citizens and other socio-economic factors.

Shadow economic relations cover all spheres of human activity, they affect the passage of all stages of the reproductive mechanism, form the “rules of the game” in modern markets. They dynamically influence the factors of modernization and globalization, and also change themselves under their influence. Today, without taking into account the shadow sector, it is actually impossible to plan and predict the development of macroeconomics.

The state authorities of many countries of the world are trying to influence the size of shadow activity in quite a variety of ways: from tightening penalties for various economic

offenses to increasing economic growth and increasing the level of education of citizens of their country. However, in order to achieve a more productive concentration and distribution of limited resources in today's global market economy, it is very important for the authorities to have reliable information about the size and branches of the shadow economy, the number of citizens employed in it, the volume of production of the illegal sector, and most importantly about the prerequisites for the so-called "work in the shadow" of organizations.

According to some estimates, in Russia, the part of the population that combines work at an official place of employment and part-time work in the shadow labor market accounts for 41 %. Of these, 34 % are engaged in unregistered business, and 66% are employed in the shadow labor market. In addition, there is a considerable part of people who have broken with the official economy and have completely devoted themselves to illegal economic activities. An important part of the problem is that the shadow economy has grown sufficiently in volume to run parallel with the official economy. According to economists, currently, its scale reaches 30 %; some experts call this number as 40 % of Russia's GDP. The shadow economy is firmly integrated with the official economy, and often even competes with it in the disposal of labor, material and financial resources.

The rapid growth of shadow economic activity in Russia is primarily due to government policy, which consists of measures to influence the country's economy by changing the amount of expenditures or revenues of the state budget, and the fiscal policy of the state. Many enterprises tried to avoid paying taxes due to too high tax rates. Business also had very significant provisions for doubts about the ability of the state to effectively dispose of tax revenues for public redistribution. As a result, a shadow economy was formed in Russia, which was much larger in scale than in other countries of the world, and had its own unique feature – tax evasion, capital flight abroad, double accounting, hidden unemployment, corruption.

One of the most important goals of the fight against the shadow economy can be considered the legalization of the informal economy and the reduction or elimination of criminal economic activity. The means of combating the shadow economy should include economic, legal and social aspects.

Currently, the following measures are applied:

– reforming the tax system, which contributes to the withdrawal of part of the income from the shadow sphere;

– tightening the fight against corruption;

– taking measures to return the capital exported from the country and stop such export by creating a more attractive investment climate in the country;

– detecting clandestine industries (for example, in the liquor industry) and suppression of their activities;

– strengthening control over financial flows, preventing money laundering;

– developing a project to bring the economy out of the shadows.

The problem of the shadow economy has become a rather serious systemic problem of national security for Russia, which can be solved only through the creation of an extensive targeted system of measures in all spheres of the life of the state and society and only through the joint efforts of the state and society.

In order to significantly reduce the size of shadow economic activity in the country, it is necessary first of all to eliminate the very root of the problem, that is, the main reasons that caused the growth of the shadow economy. The following decisions and measures should be the main ones in the system of measures to combat:

– conducting an unconditional general criminal amnesty for tax and economic non-violent crimes of individuals and officials (state and corporate) persons for a certain amount, leaving

the injured party only the right to a civil claim (this will allow the vast majority of the Russian population to legalize and repatriate the accumulated capital);

– compensation of population losses from “shock economic therapy”, hyperinflation and “privatization” by state-owned enterprises shares of banks and corporations;

– introduction of a system of economic incentives for the exit of legal entities and citizens from the shadow sector of the economy (it should be economically profitable to conduct economic activities openly);

– establishment of economically feasible, fair, but clearly administered taxation;

– promotion of non-cash payments and a tough fight against cash turnover;

– implementation of a clear and consistent state policy to support private open entrepreneurship (a system of measures the support of a particular business company should be clearly dependent on the purity of its balance sheet);

– introduction of a state system of measures for effective protection of a bona fide owner and creditor;

– implementation of a real administrative reform (the state apparatus should become an instrument for the accelerated development of private business and competitive markets in Russia);

– formation of an incorruptible, fair and highly professional law enforcement system, primarily the judicial system;

– elimination of organized crime in all spheres of society, primarily in the shadow sector of the economy and the credit and financial sphere;

– legislative establishment of the right of law enforcement agencies to provoke giving and receiving bribes in a strictly established criminal procedure (this is one of the most effective means of combating corruption and preventing it).

It is also necessary to emphasize that the success of the fight against the shadow economy and corruption is possible only if there is conscious mass support for this fight in society, and this, in turn, is achievable only if there is a high level of trust of citizens in state institutions of power and management.

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Макроэкономические аспекты теневой экономики

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Ключевые слова и фразы: анализ причин; макроэкономические аспекты; особенности развития; теневая экономика; теневая экономика в России.

Аннотация. С целью изучения макроэкономических аспектов теневой экономики автором представлен анализ причин возникновения, особенностей развития и характера теневой экономики в России. С помощью методов экономического анализа, экспертных оценок и исторической аналогии изучен большой массив данных о теневой экономике в России. В результате проделанной работы предложены макроэкономические пути борьбы с последствиями теневой экономики.

UDK 51.77

Model of Distribution of Labor Resources among Regions in Order to Improve Their Economic Indicators

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Key words and phrases: economic indicators; labour resources; model; modeling; regions.

Abstract. The distribution of labor resources by region in order to increase the level of economic indicators depends significantly on various conditions: social, economic, climatic, etc. Different regions require their own system of distribution of labor resources, depending on the size of the socio-economic system, the increase in cost caused by the increase in the cost of increasing their economic indicators as the implementation of such measures is postponed. This time factor becomes significant when the manpower is clearly insufficient. In this case, the distribution of labor resources in the region in order to increase the level of economic indicators of the socio-economic system becomes one of the most important points. The work presents a model of the distribution of labor resources among regions in order to increase their economic indicators.

Introduction

The distribution of labor resources is carried out separately both by region and by measures to increase the level of indicators of the socio-economic system: first, the available labor resources are allocated to each region of the socio-economic system, and then, within each region, the allocated labor resources are distributed by measures to increase the level of their economic indicators. Assuming that socio-economic systems must be equally protected in order to improve economic performance, the distribution of labor must be carried out in accordance with the requirement of equity, depending on the size of the socio-economic system and the type of protection applied.

Distribution of labor resources by region of the socio-economic system

Let there be n regions of the socio-economic system with the number of labor resources

N_1, …, N_n. We denote through v_i, $i = \overline{1, n}$ the number of measures implemented to increase the level of economic indicators in the i region of the socio-economic system, through c_i, $i = \overline{1, n}$ – the cost of implementing the measure at time $t = 0$, and after c_i^1, $i = \overline{1, n}$ – the cost of implementing the measure after time T, while $c_i^1 > c_i$, $i = \overline{1, n}$. Let $\overline{B}$ funds be allocated for the implementation of measures to increase the level of economic indicators of all regions of the socio-economic system. It is necessary to distribute them into n regions of the socio-economic system, believing that the allocated labor resources are not enough to implement the measures available in the regions to increase the level of economic indicators of the socio-economic system, i.e. regions of the socio-economic system, believing that the allocated labor resources are not enough to implement the measures available in the regions to increase the level of economic indicators of the socio-economic system, i.e. $c_1v_1 + … + c_nv_n = \overline{B} < c_1N_1 + c_nN_n$. The uniform labor allocation algorithm proposed in [1–3] is applicable for this case. Let us compose the following n ratios: $(A_i^1(N_i – v_i))/c_iv_i = S_i$, $i = \overline{1, n}$, where c_iv_i – the cost of implementing v_i measures to increase the level of economic indicators of the region of the socio-economic system in the current situation, while $A_i^1(N_i – v_i)$, $i = \overline{1, n}$ – is the cost of implementing the remaining measures after time T, $A_i^1 = c_i(1 + kT)$, where S_i, $i = \overline{1, n}$ – is an unknown value. Requiring it to be the same for all n regions of the socio-economic system (the principle of justice), we express through it each of the values v_i: $v_i = c_i^1N_i/(c_i^1 + c_is)$, $S_i = S$, $i = \overline{1, n.}$ Let $S = S^*$ be the single root of this equation. In this case, unknown values of v_i, $i = \overline{1, n}$ will be found as $v_i^* = v_i = c_i^1N_i/(c_i^1 + c_iS^*)$, $i = \overline{1, n}$.

Numerical example of the implementation of the model

We consider the following numerical example. Let be necessary to implement measures to increase the level of economic indicators of the socio-economic system in the socio-economic system A in three of the 19 regions. Let the number of labor resources in each region of the socio-economic system A be equal to $N_1 = 5$, $N_2 = 2$, $N_3 = 4$ thousand units, respectively. It is known that in the socio-economic system A, 15 million units were spent on the implementation of measures to increase the level of economic indicators over 5 years. Let the notional cost c of implementing one measure in the region to increase economic indicators be equal to $c = 10$ thousand units per year. If after time $T = 10$ these costs double $k = 1/T$, then c' = 20 thousand units per year. Assume $c_1 = c_2 = c_3 = c$, $c_1' = c_2' = c_3' = c'$, $\overline{B} = 10$ million units. Then we have the following: $10{,}000(v_1 + v_2 + v_3) = 10 \times 10^6 < 10{,}000(5 + 2 + 4)10^3$ where $v_i = 20{,}000N_i/(20{,}000 + 10{,}000s)$, $i = 1, 2, 3$. Cost amount in conditional units: $10{,}000(20{,}000(5 + 2 + 4)10^3)/(20{,}000 + 10{,}000s) = 10 \times 10^6$. From which $S^* = 20$, $v_1^* \approx 1$, $v_2^* \approx 1$, $v_3^* \approx 1$, number of activities undertaken to achieve economic indicators in the i region.

Distribution of labor resources by measures ensuring the improvement of economic indicators

We will highlight the i region of the socio-economic system, for which v_i^*, $i = \overline{1, n}$ measures to increase the level of economic indicators of the socio-economic system have been implemented [4–8]. Let us assume that for i region of a social and economic system m_i, $i = \overline{1, n}$ are actions for increase in level of economic indicators of a social and economic system, while S_{ik}, $i = \overline{1, n}$, $k = \overline{1, m}$ – a share of human resources from v_i^*, $i = \overline{1, n}$ the economic indicators of a social and economic system allocated in the region for one action for increase in level. Since the costs S_i, $i = \overline{1, n}$ in the region for the i activity to increase the level of economic indicators of the socio-

economic system are $S_i = cv_i^*$, $i = \overline{1, n}$, then according to the given shares S_{ik}, $i = \overline{1, n}$, $k = \overline{1, m}$ there is a distribution of labor resources S_i, $i = \overline{1, n}$ by m_i, $i = \overline{1, n}$ measures to increase the level of economic indicators $S_{ik} = S_{ik}cv_i^*$, $i = \overline{1, n}$, $k = \overline{1, m}$, $\sum_k S_{ik} = 1$.

Conclusion

Therefore, a model of the distribution of labor resources among regions was developed in order to increase their economic indicators and a numerical example of the implementation of the model has been given. In order to simulate within each region the distribution of labor resources allocated to the region for measures in order to improve their economic performance, a model for the allocation of labor resources for measures to improve economic performance in the regions of the socio-economic system is presented.

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Модель распределения трудовых ресурсов между регионами с целью повышения их экономических показателей

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Ключевые слова и фразы: моделирование; модель; распределение; регион; социально-экономическая система; трудовые ресурсы; экономические показатели.

Аннотация. Распределение трудовых ресурсов по регионам для повышения уровня экономических показателей существенно зависит от различных условий: социальных, экономических, климатических и т.п. Разным регионам требуется своя система распределения трудовых ресурсов, зависящая от численности социально-экономической системы, роста стоимости, вызванного удорожанием средств повышения их экономических показателей по мере того, как откладывается реализация таких мер. Данный временной фактор становится существенным в том случае, когда трудовых ресурсов явно недостаточно. В таком случае распределение трудовых ресурсов в регионе для повышения уровня экономических показателей социально-экономической системы становится одним из важнейших моментов. В работе представлена модель распределения трудовых ресурсов между регионами с целью повышения их экономических показателей.

UDK 378

Professional Development of Military University Cadets Using Modern Information Technologies

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Key words and phrases: cadet; information technologies; military university; professional development.

Abstract. The purpose of the article is to give theoretical substantiation of the effectiveness of the implementation of the educational process through modern digital technologies that contribute to the professional development of cadets of military universities at the level of obtaining higher education. The objective of the research is to identify promising area of digital technology to enhance interdisciplinary interaction in the study of a foreign language. The research methods are analysis and systematization of psychological and pedagogical research of domestic and foreign authors on the issues under study. The hypothesis of the research is that the professional development of cadets will be more effective with the rational use of digital technologies within the framework of interdisciplinary integration. The results of the study made it possible to conclude that the rational use of digital technologies in the educational process of the university makes it possible to ensure the relationship between professional theoretical knowledge and foreign language communicative practice, which provides motivation for self-education.

In accordance with the conception of modernization of the Russian education The Federal State Educational Standard [1] implements the strategic task of forming a new model of higher education development, based on modernization of higher education information environment, creation and implementation of information training means, meeting modern challenges of higher education system. In this context, there is a high need to integrate traditional technologies of educational process support and a new direction – information and technological. This direction, in essence, reflecting, the law of integrity and unity of the pedagogical process, is a pedagogical system that has two independent and simultaneously interrelated components: informational and technological.

The analysis of scientific literature on the issue showed that any pedagogical technology can be considered as informational due to the fact that the educational process is always

accompanied by the release and exchange of information between the teacher and the cadet. However, the modern understanding of information technology is a process that uses a set of means and methods of collecting, processing and transmitting data to obtain new quality information about the state of the object, process or phenomenon. The understanding of the importance of information technology was noted in the "Concept of the long-term socio-economic development of the Russian Federation for the period up to 2025", in which the priority areas of information technology development becomes involve:

– promoting the connection of educational institutions, museums, hospitals, libraries, and other socially important organizations to the Internet;

– expanding the use of information and telecommunication technologies for the development of new forms and methods of education, including distance – education and media education;

– creating a system of continuous professional training in the field of information and communication technologies;

– using electronic textbooks (reference books, encyclopedias) [3].

Unique capabilities of information technologies in the educational process are focused on enhancing cadets' motivation through the ability of modern technologies to adapt to the individual characteristics of the cadet (immediate feedback "user – information technology", visualization of educational information, storage of large amounts of data, automation of inquiry-search system processes, a variety of educational means of information technology).

The most complete classification of educational tools of information technology parameters is presented by O.I. Paschenko [4]. These are tools providing basic training (electronic textbooks, training systems, systems for monitoring and evaluating knowledge); tools for practical training (books, practical exercises, virtual designers, and simulation programs); auxiliary tools (encyclopedias, dictionaries, multimedia training sessions); comprehensive tools (distance learning courses).

Information technologies and information training tools have a universal character and the sphere of their application is very wide; therefore, most of them are also actively used in military higher education institutions. The combination of traditional and innovative information means of transmitting educational information provides long-term attention, increased interest, and effective assimilation of different types of information in the long-term memory of the cadet. The introduction of innovative technologies into the educational process requires finding adequate methods of working with them. An example of such an innovative method is the method of creating a "bank" of individual educational achievements of cadets, which allows providing not only the teacher, but also the cadets themselves with objective and sufficient information about the quality of their knowledge, learning process and the level of mastery of the subject. Such a "bank" reflects the dynamics of cadets' work, it is a way to demonstrate and evaluate personal and professional development. The method of creating a bank of individual accomplishments is relevant to the future military specialist, since its main purpose is to analyze and present the significant results of personal and professional development necessary for successful service in the Russian Armed Forces.

The Bank of individual educational achievements can be formed by the cadet in the discipline "Foreign Language" throughout the whole period of training in a military university, allowing at the same time to include and correlate the data registered in it with other disciplines of the university.

The use of a wide range of information technology tools in the formation of the cadet's bank of individual educational accomplishments makes it possible to monitor the results of

learning activity with feedback, along with self-monitoring and self-correction. At the same time, the teacher's efforts are focused on the analysis of the accomplishments and the possibility of correction and selection of individual learning trajectory.

Under the conditions of the educational process digitalization in accordance with the program "Electronic Higher Education" of the RF Ministry of Education, electronic educational resources are aimed not only at optimizing educational process but also at lowering predictable barriers, which increases internal motivation of cadets to study not only the subject, but the educational process as a whole, which is a requirement for higher education. According to Academician N.N. Nechaev, higher education should not be subject-oriented, but problem-based, because it is through independent resolution of professionally significant problems that a student acquires knowledge based on his/her personal experience and serving as a foundation for his/her professional development.

An electronic textbook can be used at all stages of the learning process with the direct participation of the teacher (reference to individual elements of an electronic textbook in the traditional type of learning: text, diagrams, pictures, audio or video material, etc.), indirect participation of the teacher (independent work of students to perform the task set at the lesson) and without the participation of the teacher (distance learning, class in extracurricular time, students' own initiative). The analysis of theoretical material and practical use of electronic textbook in the educational process of universities, allowed stating that electronic textbook is used not only for the purpose of quality control of training, organization of learning activities, but also for independent mastery of new material and self-monitoring. An electronic textbook is aimed at the productive activity of students, who can perform in the learning process, both the role of the object and the subject of cognitive activities. The use of an electronic textbook in the educational process allows you to manage the cognitive activity of students variably because of the different forms of providing information. The availability of self-check and additional reference materials (audio, video, text, graphic, etc.) in the electronic textbook, on the one hand, provides an opportunity for independent selection of material for a more detailed study of the topic, and, on the other hand, contributes to the development of independence as an important quality of the future specialist through reflection, self-analysis, self-control, self-correction, etc.

The use of modern information technologies and teaching methods contributes to the improvement of personal and professional development of cadets, as well as the development of skills necessary for further self-realization and self-actualization in professional activity.

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Профессиональное становление курсантов военных вузов на основе современных информационных технологий

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Ключевые слова и фразы: военный вуз; информационные технологии; курсант; профессиональное становление.

Аннотация. Цель статьи заключается в теоретическом обосновании эффективности реализации образовательного процесса на основе современных цифровых технологий, способствующих профессиональному становлению курсантов военных вузов на этапе получения высшего образования. Задача исследования заключается в определении перспективных направлений цифровых технологий для усиления междисциплинарных связей при изучении иностранного языка. Методы исследования: анализ и систематизация психолого-педагогических исследований отечественных и зарубежных авторов по исследуемой проблематике. Гипотеза исследования состоит в предположении, что профессиональное становление обучающихся будет более эффективным при рациональном использовании цифровых технологий в рамках междисциплинарной интеграции. Результаты исследования позволили сделать вывод о том, что рациональное использование цифровых технологий в образовательном процессе вуза позволяет обеспечить взаимосвязь профессиональных теоретических знаний и иноязычной коммуникативной практики, обеспечивающей мотивацию к самообразованию.

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