

MINISTRY OF EDUCATION
OF THE REPUBLIC OF BELARUS



VITEBSK STATE
TECHNOLOGICAL UNIVERSITY

EDUCATION AND SCIENCE IN THE 21st CENTURY

*Articles of the IV International
Scientific and Practical Conference
November 14, 2019*

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MINISTRY OF EDUCATION OF THE REPUBLIC OF BELARUS

Vitebsk State
Technological
University



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CONTENTS

Section 1. INDUSTRIAL TECHNOLOGIES AND EQUIPMENT 10

RESEARCH OF FEATURES OF THE COAXIAL ELECTROSPINNING OF NANOFIBERS 10

Demidova M., postgraduate student

Dr. Ryklin D., professor, Head of the Department of Textile Materials Technology

Vitebsk State Technological University, Republic of Belarus

PRODUCTION TECHNOLOGY OF FABRICS WITH VOLUMINOUS SURFACE EFFECT 13

Gorbacheva A., post-graduate student

Dr. Kogan A., professor of the Department of Technology of Textile Materials

Akindinova N., Ph.D., Dean of the Faculty of Design

Vitebsk State Technological University, Republic of Belarus

IMPROVING THERMAL COMFORT PROPERTIES FOR AUTOMOTIVE SEAT FABRICS USING PHASE CHANGE MATERIALS (PCMS) 15

Dr. Hafez Hawas, Ph.D., Assistant Professor of Technical Textile at Faculty of Applied arts

Helwan University, Egypt

TECHNOGENIC PRODUCTS OF CHEMICAL WATER TREATMENT OF HEAT ELECTROCENTRALS AS AN ADDITION TO CLINKER CERAMIC MATERIALS 20

Kauchur A., Ph.D., associate professor of the Department of Technology and Equipment of Machine Building

Vitebsk State Technological, Republic of Belarus

Hrachanikau A., Ph.D., associate professor of the Department of Ecology and Chemical Technology

Obolsky Ceramic Plant, Republic of Belarus

Manak P., post-graduate student

Vitebsk State Technological, Republic of Belarus

FEATURES OF SPECIALISTS IN INFORMATION TECHNOLOGIES TRAINING IN VITEBSK STATE TECHNOLOGICAL UNIVERSITY 24

Kazakou V., Ph.D., Head of the Department of Information Systems and Production Automation

Aliakseyeva A., MSc, assistant professor of Management Department

Vitebsk State Technological University, Republic of Belarus

RESEARCH OF THE SHRINKING PROCESS OF CORE-SPUN NITRON/POLYESTER YARN USING MICROWAVE CURRENTS	29
Kulandin A. , postgraduate student	
Dr. Kogan A., professor of the Department of Technology of Textile Materials	
Butkevich V., Ph.D., Head of the Department of Physics and Technical Mechanics	
Vitebsk State Technological University, Republic of Belarus	
INFLUENCE OF THE LOAD VALUE ON THE TOP ROLLERS OF THE DRAFTING SYSTEM OF THE RING SPINNING MACHINE ON THE YARN QUALITY	33
Makhkamova Sh., Valieva Z., Rajapov O.	
Tashkent Institute of Textile and Light Industry, Uzbekistan	
STUDY OF THE ENVIRONMENTAL IMPACT IN FUEL AND ENERGY COMPLEX OF THE REPUBLIC OF BELARUS	37
Nizhnikau A., postgraduate student	
Vitebsk State Technological University, Republic of Belarus	
ENVIROMENTAL APPROACH TO RECYCLING OF SHOE POLYURETHANES.....	41
Radyuk A., postgraduate student	
Vitebsk State Technological University, Republic of Belarus	
THE USE OF CODING METHODS AND SYSTEMS IN THE DEVELOPMENT OF ENCODING CHARACTERS FOR TEXT INFORMATION IN DATABASES	45
Stasenya T., senior lecturer,	
Mandrik O., senior lecturer,	
Vitebsk State Technological University, Republic of Belarus	
DESIGN-PROJECT OF SCHOOL MUSEUM	49
Vaitovich V., student	
Samutsina N., Ph.D., associate professor of The Department of Design and Fashion	
Vitebsk State Technological University, Belarus	
INTERACTIVE APPLICATION FOR CALCULATING THE RELIABILITY OF PRODUCTS OF LIGHT INDUSTRY	52
Vardomatskaya E., senior lecturer of the Department of Mathematics and Information Technologies,	
Grishanova P., student,	
Somova E., student	
Vitebsk State Technological University, Republic of Belarus	

INTERIOR PROJECT OF CHILDREN 'S ART SCHOOL 56

Zaharevich V., student

Samutsina N., Ph.D., associate professor of The Department of Design and Fashion

Vitebsk State Technological University, Republic of Belarus

MEASUREMENT OF DESIGN PARAMETERS OF THE FINISHED GARMENT BY THE NON-CONTACT METHOD 59

Zamotsin M., postgraduate student

Dyagilev A., Ph.D., associate professor of the Department of Mathematics and Information Technologies

Vitebsk State Technological University, Republic of Belarus

Section 2. SOCIAL, HUMANITARIAN AND ECONOMIC PROBLEMS OF EDUCATION AND SCIENCE DEVELOPMENT IN THE 21TH CENTURY.....62

LABOUR COSTS IN THE ORGANIZATION IN A DIGITAL ECONOMY..... 62

Aliakseyeva A., MSc, assistant professor of Management Department

Vitebsk State Technological University, Republic of Belarus

BRANDING OF THE REGION IN THE RESIDENTIAL NATURE-CLIMATIC ZONE BY THE EXAMPLE OF VITEBSK REGION 66

Bashkirova Y., student

Polotsk State University, Republic of Belarus

A CROSS- CULTURAL APPROACH TO THE VOCATIONAL TESTING..... 70

Burdyko O., lecturer of Foreign Languages Department

Vitebsk State Technological University, Republic of Belarus

EQUILIBRIUM OF FOREIGN TRADE OF TEXTILE PRODUCTS AND CLOTHES IN THE EUROPEAN UNION COUNTRIES..... 74

Bykau K., senior lecturer of The Department of Economics

Vitebsk State Technological University, Republic of Belarus

ANTI-INFLATIONARY REGULATION BY MONETARY METHODS IN THE REPUBLIC OF BELARUS79

Cheplyansky A., Ph.D., associate professor of The Department of International Economic Relations

Belarusian State Economic University, Republic of Belarus

VISA-FREE REGIME AS A FACTOR OF INCREASING TOURIST FLOW OF BRASLAV DISTRICT .. 83

Dubko N., postgraduate student

Polotsk State University, Republic of Belarus

**INFORMATIZATION AS A FACTOR OF DEVELOPMENT OF MODERN ECONOMICS AND
ENSURING COMPETITIVENESS86**

Egorova V., Ph.D., associate professor of The Department of Economic Theory and Marketing

Vitebsk State Technological University, Republic of Belarus

**POLYMORPHISM OF MODERN NEEDS OF MARKET SUBJECTS IN THE SYSTEM
OF MARKETING ACTIVITY90**

Golovchanskaya E., Ph.D., associate professor of The Department of Analytical Economics and Econometrics

Belarusian State University, Republic of Belarus

THE USE OF BIG DATA IN THE GRADUATE'S EMPLOYMENT ANALYTICS..... 93

Grishanova Y., student

Dr. Vankevich A., professor, Vice-rector for Research

Vitebsk State Technological University, Republic of Belarus

THE PURPOSES OF TESTS IN EDUCATION96

Imperovich V., lecturer of Foreign Languages Department

Vitebsk State Technological University, Republic of Belarus

**QUALITATIVE AND QUANTITATIVE RESEARCH METHODS IN LANGUAGE:
TESTING AND ASSESSMENT 100**

Izmailovich O., lecturer of Foreign Languages Department

Vitebsk State Technological University, Republic of Belarus

**METHODOLOGY FOR THE DEVELOPMENT OF STRATEGIC FORECASTS
FOR THE PRODUCTION OF LIGHT INDUSTRY GOODS 104**

Kalinouskaya I., Ph.D., associate professor of The Department of Economic Theory and Marketing

Kerriev K., student

Vitebsk State Technological University, Republic of Belarus

**OPPORTUNITIES FOR USING ANTI-CRISIS MARKETING BY BELARUSIAN LIGHT INDUSTRY
ENTERPRISES 107**

Kalinouskaya I., Ph.D., associate professor of The Department of Economic Theory and Marketing

Sherstneva O., senior lecturer of The Department of Economic Theory and Marketing

Vitebsk State Technological University, Republic of Belarus

PROBLEMS OF EVALUATING THE EFFECTIVENESS OF UNIVERSITY-TYPE TECHNOLOGY

PARKS 111

Kasayeva T., Ph.D., Head of The Department of Economics

Novoseltseva A., master student

Vitebsk State Technological University, Republic of Belarus

PROBLEMS OF THE DEVELOPMENT OF INTELLECTUAL CAPITAL OF THE REPUBLIC

OF BELARUS IN THE CONTEXT OF FORMATION OF POST-INDUSTRIAL ECONOMY 115

Lebedeva E., Ph.D., assistant professor of The Department of Economic Theory and Marketing

Vitebsk State Technological University, Republic of Belarus

RETURN OF ASSETS AS A FINAL INDICATOR OF EFFICIENCY OF BUSINESS OPERATION 119

Miasnikova A., student

Kasayeva T., Ph.D., Head of The Department of Economics

Vitebsk State Technological University, Republic of Belarus

AN OVERVIEW OF THE IMPLEMENTATION OF CORPORATE SOCIAL RESPONSIBILITY

IN LEBANON 124

Nesrine Harfoush, Public Relations Officer

Arts Sciences and Technology University in Lebanon, Lebanon

Postgraduate student Belarusian State Economic University, Republic of Belarus

THEORETICAL ASPECTS OF DETERMINING THE POTENTIAL OF THE ENTERPRISE..... 127

Nikolayeva Y., senior lecturer of the Department of Economic Theory and Marketing

Vitebsk State Technological University, Republic of Belarus

PRIORITY TRENDS OF TAX ADMINISTRATION DEVELOPMENT IN ORDER TO INCREASE

THE EFFICIENCY OF SERVICING PAYERS..... 131

Rudinskaya T., student

Belarusian State Economic University, Republic of Belarus

FORMATION OF EXPORT STRATEGY OF ORGANIZATIONS BASED ON INNOVATIVE

MARKETING TECHNOLOGIES 134

Rudnitski D., senior lecturer of the Department of Economic Theory and Marketing

Vitebsk State Technological University, Republic of Belarus

CLOUD TRANSLATION SOFTWARE 2019 REVIEW	138
Serebryakova V. , lecturer of Foreign Languages Department Vitebsk State Technological University, Republic of Belarus	
CRIMINAL LIABILITY FOR EVASION FROM REPAYMENT OF ACCOUNTS PAYABLE	142
Shelyagina A. , student Panteleeva N. , Ph.D., Head of the Department of Law Mogilev State University named A. A. Kuleshov, Republic of Belarus	
THE ROLE OF AGRICULTURE IN THE DEVELOPMENT OF THE GEORGIAN ECONOMY	146
Sovetnikova O. , Ph.D., associate professor of The Department of Finance and Commercial Activity Vitebsk State Technological University, Republic of Belarus	
REASONS TO LEARN LANGUAGES.....	150
Stepanov D. , Head of Foreign Languages Department Vitebsk State Technological University, Republic of Belarus	
INNOVATIVE ECONOMICS: TRENDS IN THE DEVELOPMENT OF INTERNET SERVICES IN THE CONTEXT OF TAX ADMINISTRATION	154
Vankevich Y. , student Belarusian State Economic University, Republic of Belarus	
COMPARATIVE ANALYSIS OF SOFTWARE TO CREATE INTERACTIVE APPLICATIONS.....	157
Vardomatskaya E. , senior lecturer of the Department of Mathematics and Information Technologies Somova E. , student Vitebsk State Technological University, Republic of Belarus	
INTERACTIVE APP ‘DEPOSIT CALCULATOR’ AS A METHOD FOR DETERMINING INCOME FROM OPENING A DEPOSIT	161
Vardomatskaya E. , senior lecturer of the Department of Mathematics and Information Technologies Somova E. , student Dubkova M. , student Vitebsk State Technological University, Republic of Belarus	
LIMITED COSTS: BOOKKEEPING AND TAXATION.....	164
Vasiokha V. , student Kasayeva T. , Ph.D., Head of The Department of Economics Vitebsk State Technological University, Republic of Belarus	

**INTERNATIONAL COMPETITIVENESS CLUSTERS ECONOMY WITHIN THE FRAMEWORK
OF EUROPEAN INTEGRATION.....169**

Dr. Yashava G., professor, Head of The Department of Economic Theory and Marketing

Vailunova Y., Ph.D., associate professor of The Department of Economic Theory and Marketing

Vitebsk State Technological University, Republic of Belarus

**INFLUENCE THE STATE AND LEVEL OF TRANSPORT DEVELOPMENT ON THE DYNAMICS
OF MACROECONOMIC INDICATORS IN VITEBSK REGION 173**

Zhuchkevich O., senior lecturer of the Department of Finance and Commercial Activity

Vitebsk State Technological University, Republic of Belarus

Section 1. INDUSTRIAL TECHNOLOGIES AND EQUIPMENT

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RESEARCH OF FEATURES OF THE COAXIAL ELECTROSPINNING OF NANOFIBERS

ИССЛЕДОВАНИЕ ОСОБЕННОСТЕЙ КОАКСИАЛЬНОГО ЭЛЕКТРОФОРМОВАНИЯ НАНОВОЛОКОН

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ABSTRACT

*ELECTROSPINNING, NANOFIBERS, COAXIAL
SPINNING HEAD, BILAYERED NANOFIBER
STRUCTURES, POLYMERS*

The work is devoted to the study of the process of electrospinning nanofibrous materials on the Fluidnatek LE-50 installation using a coaxial spinning head. Rational modes of coaxial electrospinning of nanofibrous materials and coatings by a solution of polyvinyl alcohol were determined for joint and separate operation of the inner and outer needles of the spinning head. The behavior of the electrospinning polymer jet with unequal volumes of fiber-forming solution supply through the external and internal coaxial needles is investigated.

АННОТАЦИЯ

ЭЛЕКТРОФОРМОВАНИЕ, НАНОВОЛОКНА, КОАКСИАЛЬНАЯ ПРЯДИЛЬНАЯ ГОЛОВКА, ДВУХСЛОЙНЫЕ НАНОВОЛОКОННЫЕ КОНСТРУКЦИИ, ПОЛИМЕРЫ

Работа посвящена исследованию процесса электроформования нановолокнистых материалов на установке Fluidnatek LE-50 при использовании коаксиальной прядильной головки. Были определены рациональные режимы коаксиального электроформования нановолокнистых материалов и покрытий путем раствора поливинилового спирта для совместной и раздельной работы внутренней и внешней игл прядильной головки. Исследовано поведение электроформовочной полимерной струи при неодинаковых объемах подачи волокнообразующего раствора по внешней и внутренней иглам коаксиальной прядильной головки.

Nowadays interest in the production of electrospun nano- and microfibers is growing rapidly due to the unique properties and characteristics of the produced non-woven coatings and structures [1, 2]. Electrospinning is a promising method for producing continuous nanofibrous materials using a high potential electric field [3]. A number of specific characteristics, such as a high surface-to-volume ratio, flexibility in surface functionalities and excellent mechanical properties can be achieved only when the diameter of the polymer fiber is reduced to a nanoscale [1, 2]. Of particular interest is electrospinning from polymer solutions and melts, since the obtained fibers have many potential applications [4]. Among the most relevant of them are drug delivery, biotechnology, wound healing, tissue engineering, the creation of dressings, prostheses and medical scaffolds, cosmetics, filtration, the production of energy converters and storage devices, catalysts and enzyme carriers, the creation of protective clothing, sensors, electronic and semiconductor materials and etc.

The aim of this work was to determine the rational modes for producing nanofiber materials using a coaxial spinning head. The aqueous solution of 15 % polyvinyl alcohol Selvol 205 produced by Sekisui Specialty Chemicals Europe S.L. (USA) was used. The electrospinning process is considered as effective when it is stable and provides the maximum performance.

We carried out our investigations of the electrospinning process using Fluidnatek LE-50 device equipped with the coaxial spinning head containing inner and outer needles. This head allows the production of bilayered nanofiber structures therefore it is effective for encapsulating biorelevant nanocomposites and fibers [4]. We consider such electrospinning process which is carried out with the droplet size at the tip of the needle of the spinning head does not change over time and the process of formation and drawing of the solution jet occurs continuously as a stable electrospinning. The maximum flow rate of the solution was adopted as a criterion for the efficiency of the electrospinning process.

The behavior of the polymer jet and the parameters of the electrospinning process are the same as with the total flow rate while the joint internal and external needles working. We have determined the following rational values of the process parameters that ensure stable production of nanofiber coatings and materials: tip-to-collector distance is 8 cm, voltage is 25 kV for inner needle and 26 kV for outer needle, polymer solution flow rate is 600 $\mu\text{l}/\text{hour}$ for single needle operation and 300 $\mu\text{l}/\text{hour}$ for their joint work. In this case, at different ratios of the feeding polymer solution through the inner and outer needles, the electrospinning process remains stable and this rational production of nonwoven nanofiber materials: tip-to-collector distance is 8 cm, voltage is 25 kV for external and internal needle and 26 kV for internal needle, the total two needles feeding rate is 600 $\mu\text{l}/\text{hour}$.

These results are relevant for studies on controlling polymer feed rates to vary the concentration of active substance in the material being produced. The revealed features of the coaxial spinning head will allow to create specific materials and coatings for the needs of medicine and aesthetic cosmetology.

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PRODUCTION TECHNOLOGY OF FABRICS WITH VOLUMINOUS SURFACE EFFECT

ТЕХНОЛОГИЯ ПРОИЗВОДСТВА ТКАНЕЙ С ОБЪЕМНЫМ ЭФФЕКТОМ ПОВЕРХНОСТИ

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ABSTRACT

*LINEN YARN, COTTON LINEN FIBER, BULK,
WEAVING, FINISHING*

The article deals with a new fabric structure for decorative jacquard fabric in order to increase the volume of the fabric and reduce the surface density.

АННОТАЦИЯ

*ЛЬНЯНАЯ ПРЯЖА, ХЛОПКОЛЬНЯНОЕ ВО-
ЛОКНО, ОБЪЕМНОСТЬ, ТКАЧЕСТВО, ОТДЕЛКА*

В статье рассматривается новая структура ткани для декоративной жаккардовой ткани с целью повышения объемности ткани и уменьшения поверхностной плотности.

An important task today is to develop new means of creative design of fabrics by weaving and finishing methods. Research aimed at developing methods for obtaining new weaves that create visual effects of different volumes on the fabric becomes relevant [1,2].

A new structure of linen two-layer decorative fabric for the production of plaids is studied, which allows to create a double-sided pattern and increased volume of the surface. Traditionally, for the production of plaid fabrics with volumetric effects, a two-layer structure is used, in which weft threads are laid in a ratio of 1:1 and differ in appearance, linear density and properties, while one of the wefts has a high shrinkage ability. In the developed fabric, weft threads of the upper and lower layers are not highly shrinkable, and the pattern-forming weft has a high shrinkage ability during the final finishing of the fabric. This structure allows to get more volume and reduce the surface density at the ratio of the weft of the upper layer (1,2) to the padding (pattern-forming P1) to the weft of the lower layer (I, II) 2:1:2. Weaves are designed in such a way that with the help of weaving effects the variety of texture of the pattern is transmitted. For this purpose in the top layer of fabric interlacing is used: twill 2/2, 3/1 with various sign of shift, satin, matting, reps, linen interlacing. The lower layer uses a plain weave.

The volumetric texture of the surface of the two-layer fabric of the described structure depends on the shrinkage of the fabric during wet processing, and the shrinkage value is associated with the width of the treated fabric. Using facilities of Orsha Linen Mill production of experimental samples of decorative fabrics for the new structure was done, as the warp and the weft of the upper and lower layers used linen yarn wet spun linear density of 56 tex, as weft, two yarns of cottonized flax fiber: linear density of 50 and 110 tex. Prototypes were tested in the laboratory of the enterprise.

Complex weaves of a new kind are designed, which can be combined in one fabric structure. As a result, when used in one of the layers of threads with highly shrinkable properties, the combination of hollow and connected areas in one fabric leads to the volume of the fragments of the pattern.

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IMPROVING THERMAL COMFORT PROPERTIES FOR AUTOMOTIVE SEAT FABRICS USING PHASE CHANGE MATERIALS (PCMS)

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ABSTRACT

PHASE CHANGE MATERIALS (PCMS), THERMAL COMFORT, AUTOMOTIVE SEATS, FUEL ECONOMY, TAILPIPE EMISSIONS, TECHNICAL TEXTILES, CHENILLE YARNS

An operating air-conditioning (A/C) system is currently the largest ancillary load on automobile engines, negatively impacting both fuel economy and tailpipe emissions. Improving the comfort properties by using PCMs is an effective way to increase thermal comfort at little energy cost, resulting in reduced air conditioning needs and fuel use. Automotive seats fabric is well suited for effective use of PCMs due to their large contact area with and close proximity to the occupants. The thermal comfort improvement can be used to reduce the A/C heat capacity by 4 %.

The objective of this study is investigating the impact of fabrics made of chenille yarns containing PCMs on their properties that relate to comfort. These fabrics are mainly designed for seating in public transportation, including automotive.

Introduction

The automobile industry is the largest user of technical textiles, with about 20 kg in each of the 45 million or so cars made every year worldwide [1]. It is estimated that about 45 square meters of textile material is used in an average car and the percentage of textiles in a car is about 2 % of the overall weight of the car [2]. The weight of textile components in automobiles is expected to rise to 35 kg by 2020 [3].

The 20 kg of textiles in an average car is made up approximately from 3.5 kg seat covers, 4.5 kg carpets, 6.0 kg other parts of the interior and tyres and 6.0 kg glass fibre composites [4]. The seat is probably the most important item in the car interior. It is the first thing the customer sees when the car door is opened and he or she will probably instinctively touch it; there is only one opportunity to make the most of this first impression). The seat is also the main interface of man and machine and seat comfort is of paramount importance [3]. The car seat must be comfortable in all senses of the word; psychologically, physiologically and thermally [3].

An operating air-conditioning (A/C) system is currently the largest ancillary load on automobile engines, negatively impacting both fuel economy and tailpipe emissions. An up-to-date solution for thermal comfort control of a car seat is to use microcapsules containing phase change material (PCM) [5]. PCMs are materials that can absorb, store and release large amounts of energy, in the form of latent heat, over a narrowly defined temperature range, also known as the phase change range, while that material changes phase or state (from solid to liquid or liquid to solid) [5]. As shown in below fig.

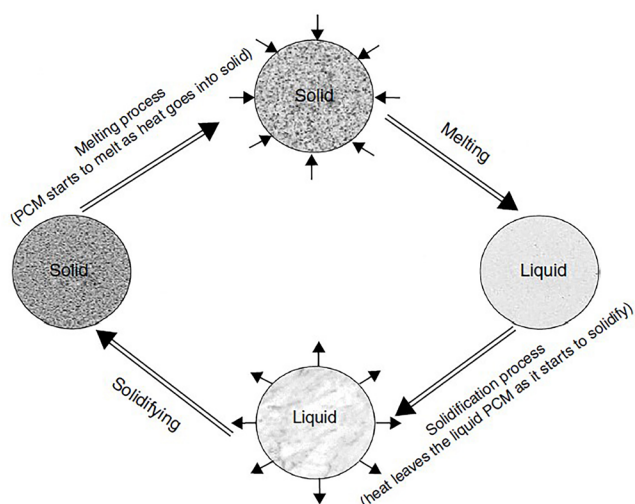


Figure 1 – Schematic of phase cycle of phase change material

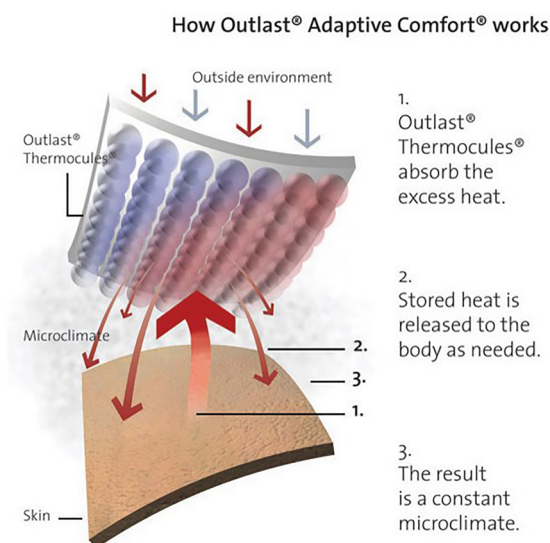


Figure 2 – Functioning principle of PCM in a fabric

Materials and Methods

The main purpose of the present study is to achieve optimum thermal comfort properties for automotive seat fabrics through these parameters: (Chenille's pile yarn material, Pile length, Weave structures and Auxiliary weft materials).

As a starting point, the methodology of using Chenille yarns for automotive car seats fabric was based on these facts

- Chenille yarns are fancy yarns with aesthetic, soft and fuzzy surface. They have become the choice of designers for many items.
- In this research, our objective is to use the largest percentage of PCMs materials in produced fabrics, this cannot be achieved by using Traditional yarns, so fancy yarns offered a big deal in this issue, especially chenille yarn.

Chenille yarn consists of short lengths of spun yarn or filament that are held together by two ends of highly twisted fine strong yarn. The short lengths are called the pile and the highly twisted yarns are called the core or lock yarn.

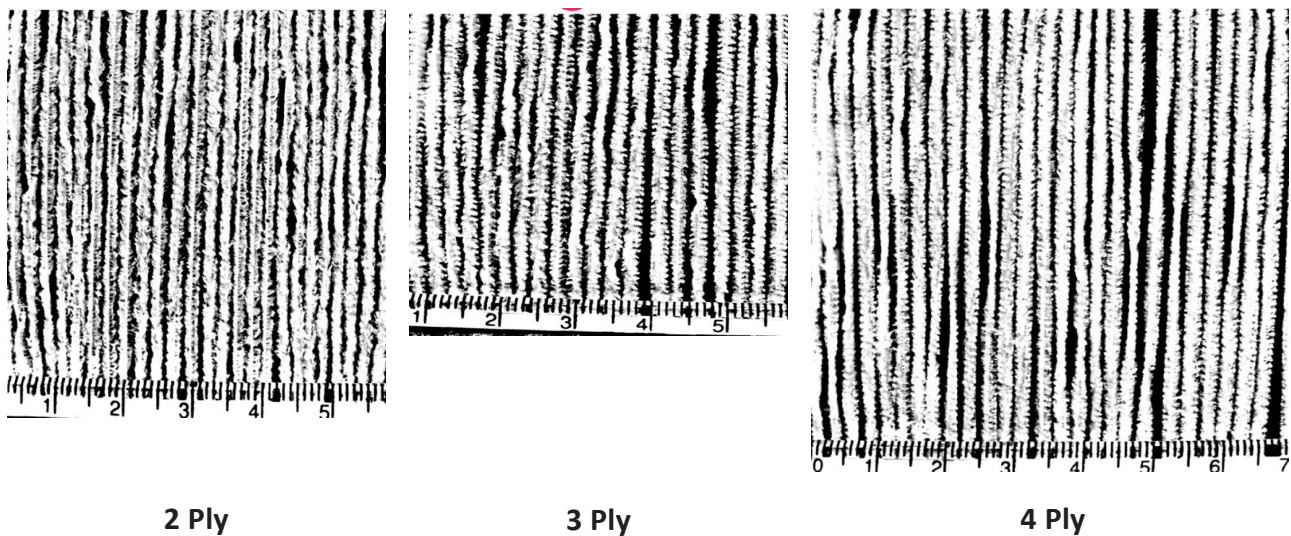


Figure 3 – Produced chenille yarns (initial samples)

The previous 3 chenille yarns were used for producing the three chenille fabrics.

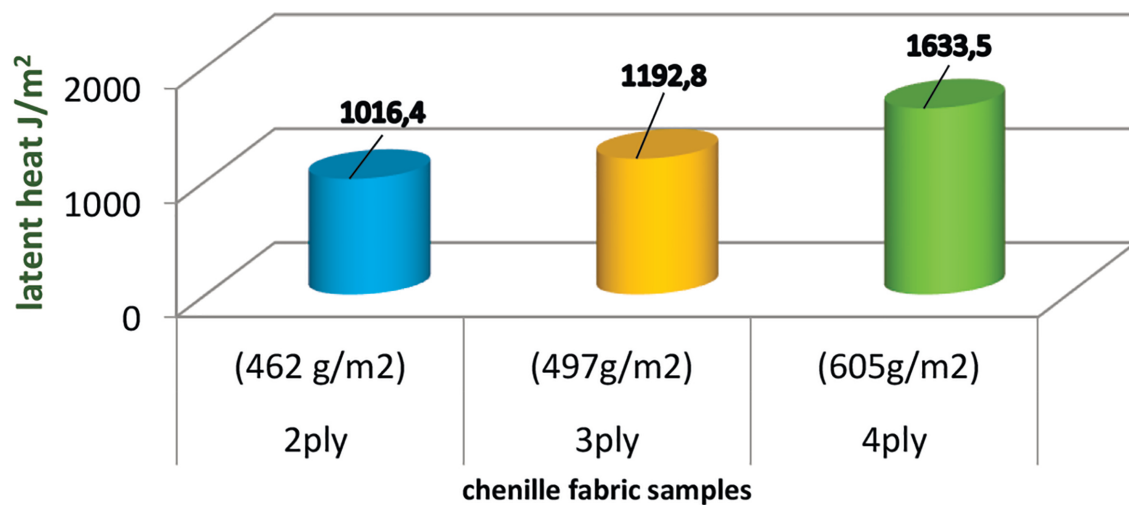
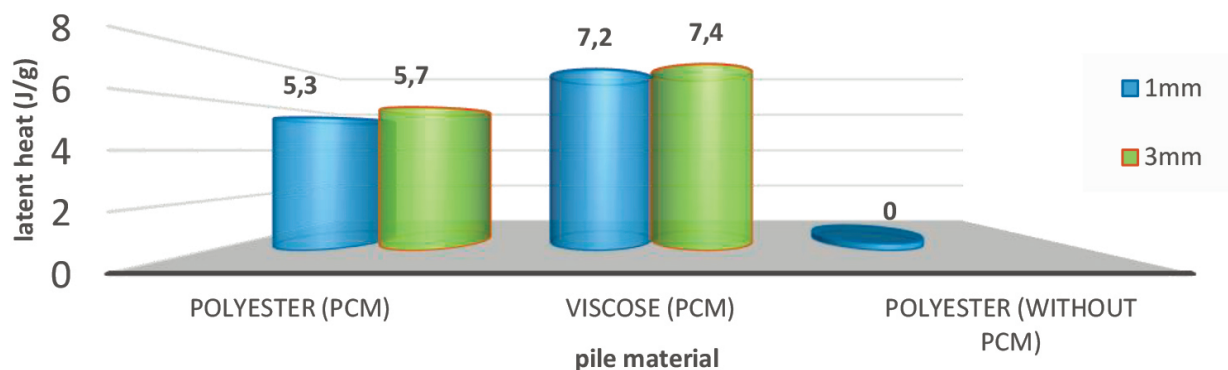
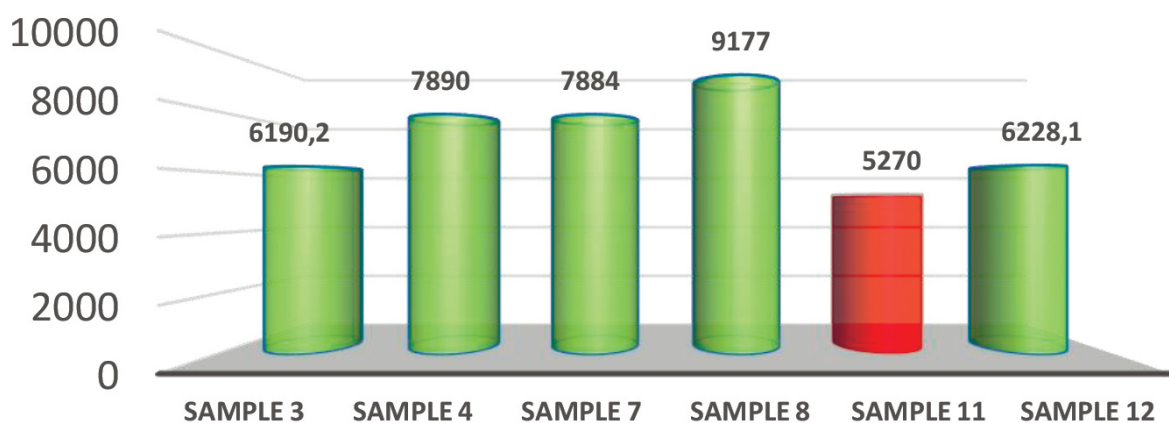


Figure 4 – Preliminary Work (initial samples) DSC test result: produced chenille yarns & fabrics

According to the thermal test result of previous produced chenille yarns and fabrics (initial samples), the research team decided to make some changes in the construction of chenille yarns & fabrics. Chenille yarns (five samples) were produced by using two parameters (pile material & pile length) on the same machine, then these yarns used for producing fifteen chenille fabrics.

Results:**Figure 5 – Yarn thermal capacity (DSC test)****Figure 6 – Samples with the Best heat capacity****Conclusion:**

1. Chenille yarns containing phase change materials (PCMs) were achieved overcoming several technical production procedures.
2. Our findings show that there is a tendency to an increase in latent heat readings with the increase in number of Chenille's pile yarn. That's to say Chenille yarns number plays a critical role in holding latent heat within the structure.
3. We also conclude that increasing PCMs percentage in the produced fabrics lead to an increase in thermal comfort of car seat fabrics (latent heat %)
4. Improving the comfort properties by using PCMs is an effective way to increase thermal comfort at little energy cost, resulting in reducing air conditioning and fuel consumption.

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UDC 691.4

TECHNOGENIC PRODUCTS OF CHEMICAL WATER TREATMENT OF HEAT ELECTROCENTRALS AS AN ADDITION TO CLINKER CERAMIC MATERIALS

ТЕХНОГЕННЫЕ ПРОДУКТЫ ХИМИЧЕСКОЙ ВОДОПОДГОТОВКИ ТЕПЛОЭЛЕКТРОЦЕНТРАЛЕЙ КАК ДОБАВКА К КЛИНКЕРНЫМ КЕРАМИЧЕСКИМ МАТЕРИАЛАМ

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ABSTRACT

*CERAMIC TILES, MAN-MADE PRODUCTS,
CHP CHEMICAL WATER TREATMENT*

The article presents the results of research on the possibility of using technogenic raw materials in the production of clinker ceramic construction materials. As a result of the studies carried out, the possibility of using various man-made products of CHP chemical processing in the production of clinker ceramic materials has been established, which is an important reserve for resource saving in construction.

АННОТАЦИЯ

*КЕРАМИЧЕСКАЯ ПЛИТКА, ТЕХНОГЕННЫЕ
ПРОДУКТЫ, ХИМИЧЕСКАЯ ВОДОПОДГО-
ТОВКА ТЭЦ*

В статье приведены результаты исследований по возможности использования техногенного сырья при производстве клинкерных керамических строительных материалов. В результате проведённых исследований установлена возможность использования различных техногенных продуктов химводообработки ТЭЦ в производстве клинкерных керамических материалов, что является важным резервом ресурсосбережения в строительстве.

Technogenic products are accumulations of mineral substances on the surface of the earth or in mine workings, which are waste from mining, processing, metallurgical and other industries and are suitable in quantity and quality for industrial use, which becomes possible

as the technology of its processing and changes in economic conditions [1].

Of the branches of material production capable of consuming industrial (technogenic) waste, the building materials industry is the most capacious. At present, the JSC «Obolsky Ceramic Plant» plans to expand its product range through the production of ceramic clinker products using man-made chemical water treatment products of combined heat and power plants.

The purpose of the present work is to study the possibility of using technogenic products of chemical water treatment of cogeneration plants as an additive in the manufacture of ceramic clinker materials.

Clays and kaolins are the main raw materials for the production of clinker ceramic materials. Along with this, their mixtures with various additives are widely used, for example, fluxes, thinning, pore-forming, plasticizing. So, for example, thinning additives are introduced into the composition of the ceramic mass to reduce ductility and reduce air and fire shrinkage of clays. Such additives include chamotte, dehydrated clay, sand, granulated blast furnace slag, waste from cogeneration plants and deferrization stations (precipitation of chemical water treatment).

Analysis of literature and patent information has shown that various man-made products are used to modify the ceramic mass to make clinker ceramic materials:

- argyllite ground to size less than 1.0 mm at content of fraction 0-0.5 mm not less than 80 %, and additionally apatite concentrate;
- tails of cobalt concentrate extraction in the amount of 20-40 % bulk mass 920 kg/m³, density 2720 kg/m³, refractory 1200 °C;
- ground basalt of 0.063 mm fraction as fluxing additive;
- granite sifts of 0.1-3.0 mm fraction as a shearing additive and additional granite sifts of less than 0.1 mm fraction as a melt;
- glass waste.

Technogenic products formed during chemical water treatment at the CHPP are a wet mass of dark brown color. Depending on the time of year and the place of formation, the waste contains from 5 to 35 % moisture [4]. The phase composition of technogenic chemical water treatment products, established using x-ray phase analysis, depending on the sampling time, was: silica SiO₂ and calcite CaCO₃ in a quantitative ratio of 16 wt. % and 84 wt. %, respectively (a sample of technogenic products taken in the summer); silica SiO₂ – 2 wt. %; FeO (OH) – 16 wt. %; Ca (CO₃) - 82 wt. % (a sample of technogenic products taken in the winter). [3].

The oxide composition of technogenic chemical water treatment products was determined at the testing center of the State Enterprise "Institute NIISM". The oxide content was determined according to GOST 2642-97, GOST 21216-2014. Table 1 shows the oxide composition of technogenic products of chemical water treatment of cogeneration plants.

Table 1 – Oxide composition of technogenic products of chemical water treatment of combined heat and power plants

Component	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	FeO	TiO ₂	P ₂ O ₅	CaO	MgO	П.п.п.	SO ₃	Na ₂ O	K ₂ O
Wt, %	0.24	0.64	1.77	2.85	0.03	n/a	47.66	2.26	44.15	n/a	0.20	0.08

The analysis of the particle size distribution of the sample was carried out by dry sieving with a set of sieves certified by RUE BelGIM in accordance with MA MH 63-98 "Laboratory construction sieves". The granulometric composition of chemical water treatment sediments of CHP is the following: 0.315-1.25 mm – 5.8 %; 0.0071-0.315 mm – 18.6 %; fraction < 0.0071 mm – 75.6 % [4].

The main material for the production of clinker is shale clay. The composition of shale clay is optimal for the manufacture of high-strength products: it contains no impurities of minerals, chalk or alkali metal salts. Shale clay has a homogeneous composition, is elastic and refractory. A good clay should have the following properties:

- during sintering, it does not soften in the mass so much that deformation can occur;
- it's likely to contain very limited amounts of CaO and MgO (1.25–2.0 %), which at high contents cause their sharp and sudden softening;
- it must contain at least 6–9 % Fe₂O₃ and at least 3.3–7.8 % alkalis that promote sintering.

The results of studies of the phase and oxide composition of technogenic products of chemical water treatment of cogeneration plants showed the presence of a significant number of adverse phases of calcite and FeO (OH). As a result of this, to reduce the harmful effect on the clinker of the presence of (Ca, Mg) CO₃ and FeO oxides in waste, the technogenic products of chemical treatment of thermal power plants should be crushed in a ball mill.

The preliminary studies on the use of technogenic products of chemical water treatment of cogeneration plants as exhaust additives in the production of clinker ceramic materials showed that when using these wastes, the quality of the products does not deteriorate.

For the production of clinker ceramic materials under laboratory conditions, JSC Obolsky Ceramic Plant obtained clinker from three clay feed compositions: clay from the Rudnya-2 deposit – 25–35 %; clay of the Latnenskoye deposit in the Voronezh region – 35–45 %; clay of the Zapolye deposit – the rest. According to STB 1450-2010 "Process documentation. Compounding. General Requirements for Development" we have developed a formula and compositions of raw materials for the production of experimental copies of ceramic paving tiles using chemical water treatment deposits of CHP. Technogenic products of chemical water treatment of thermal power plants were used as exhaust additives.

Preliminary studies have shown that the inclusion of a prepared additive of technogenic products of chemical water treatment of heat and power plants as a thinner additive in the clinker does not impair the quality characteristics of the products. Due to the complexity of

structure formation and strict requirements for water absorption – clinker brick no more than 6 %, and tiles no more than 4 % - further studies are needed to identify the positive effect of fine-dispersed additives of technogenic chemical water treatment plants of heat and power plants on the properties of ceramic clinker products.

Thus, as a result of the studies carried out, the chemical, phase and oxide composition of the deposits of chemical water treatment of thermal power centers is determined. Man-made products of energy complex (waste of chemical water treatment of CHP) according to chemical, phase, oxide and granulometric composition can be used as annealing additives or replacement of part of initial raw materials in production of clinker ceramic materials. This will lead to an expansion of the range of ceramic products produced, to improvement of the environmental situation and reduction of energy costs at the enterprise.

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UDC 004

FEATURES OF SPECIALISTS IN INFORMATION TECHNOLOGIES TRAINING IN VITEBSK STATE TECHNOLOGICAL UNIVERSITY

ОСОБЕННОСТИ ПОДГОТОВКИ ИТ-СПЕЦИАЛИСТОВ В ВИТЕБСКОМ ГОСУДАРСТВЕННОМ ТЕХНОЛОГИЧЕСКОМ УНИВЕРСИТЕТЕ

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ABSTRACT

IT SPECIALISTS TRAINING, QUALITY OF
IT SPECIALISTS TRAINING, IT SPECIALIST
COMPETENCIES, PRACTICE-ORIENTED
TRAINING

The article describes the experience of IT specialists training at VSTU. The relevance and demand for specialists in this field on the labor market, the importance of university participation in international educational projects and programs are noted. The directions of improving the quality of training IT specialists were identified: cooperation with employers at all stages of the educational process, joint training laboratories development, using of a project and problem-oriented approach in training, remote services for organizing software development, advanced learning of a foreign language, the learning path taking into account current trends in education and labor market needs.

АННОТАЦИЯ

ПОДГОТОВКА ИТ-СПЕЦИАЛИСТОВ, КА-
ЧЕСТВО ПОДГОТОВКИ ИТ-СПЕЦИАЛИСТОВ,
КОМПЕТЕНЦИИ ИТ-СПЕЦИАЛИСТА, ПРАК-
ТИКО-ОРИЕНТИРОВАННОЕ ОБУЧЕНИЕ

В статье описывается опыт подготовки ИТ-специалистов в ВГТУ. Отмечается актуальность и востребованность специалистов данной сферы на рынке труда, важность участия университета в международных образовательных проектах и программах. Выявлены направления повышения качества подготовки ИТ-специалистов: сотрудничество с работодателями на всех стадиях учебного процесса, создание совместных учебных лабораторий, использование проектного и проблемно-ориентированного подходом в обучении, использование удаленных сервисов для организации разработки программного обеспечения, углубленное изучение иностранного языка, формирование траектории обучения с учетом современных тенденций в образовании и потребностей рынка труда.

The IT industry plays one of the key roles in the Belarusian economy, it has been growing rapidly over the past 10 years. According to the job search service RABOTA.TUT.BY, the demand for services, products and specialists in the field of information technology continues its growth [1]. According to the information of media portal on the IT industry in Belarus and the world <https://dev.by/> case studies, over 5 years, the share of IT professionals in the regions of Belarus grew by a third, to 11.8 %. Minsk with its educational and career opportunities remains the main center of attraction. The share of remote development that could affect the ranking of regions is small. At the same time the offices of large companies and local activities in other settlements are not so numerous as to compete for personnel with the capital of Belarus [2].

According to the data of one of the world's largest audit and consulting companies Ernst & Young (EY), in Belarus today there are more than 115 thousand specialists in the field of information and communication technologies (ICT). 85 thousand of them are directly employed in the ICT area, the rest are involved in other sectors of the economy [3].

Vitebsk State Technological University has been training specialists in the field of automation for more than 30 years. Graduates of this study programme design software and hardware automation systems and often work as software developers. Accumulating this experience, in 2013 the university launched a study programme "Information Systems and Technologies" with the qualification of a software engineer. Students acquire skills in two areas: software development using the most popular technology stacks, its integration and maintenance; design of hardware and software systems based on microprocessor technology. It's a very successful combination of competencies, as shows different robotics competitions winning by VSTU students.

A significant contribution to improving the quality of IT specialists training was made by the university's participation in the implementation of the international project "Innovative ICT Education for Socio-Economic Development" (IESED) of the Erasmus+ program. The specific objective of the project is to develop modern competences of IT specialists with the help of upgrading study programmes, improving study environment, purchasing eLearning equipment for Belarusian universities according to Bologna requirements. The project has been implemented since 2017 by an international consortium of universities, including universities in Lithuania (the project's coordinator is Alytus University of Applied Sciences), France, Great Britain and Poland, as well as leading universities in Belarus. During the internships and seminars held within this project in European universities, VSTU teachers gained great experience in collaborating and organizing the training of IT specialists in Europe.

To ensure communication with the labor market and the development of the IT specialists competencies required, the university works closely with leading software development companies. The most productive is cooperation with ones that include training laboratories. However, not all IT companies can afford such units. For small companies, VSTU provides the

opportunity to open such a laboratory in the university. Thanks to this form of cooperation, the university can use the laboratory in the educational process, improve the qualifications of teachers, and the company gets the opportunity to conduct trainings, classes and courses without attracting its production facilities and its employees.

The most successful projects in this direction implemented at VSTU are the research and development laboratory opened jointly with ITechart; educational innovation laboratory opened as a joint project with the Andersen IT company; Training and research laboratory of mechatronics and automation opened jointly with the OVEN company.

The internships that students undergo at the training laboratories of IT companies and in specialized joint laboratories allow students to develop software development skills. Such events are especially useful for adapting students to working conditions in modern companies, because the organization of work there is as close as possible to the real working conditions of the software engineer.

IT companies use a multi-stage selection of candidates for employment: an interview; training where the mentor forms an idea of the basic psychological and professional indicators of the participants; an internship, where the applicants who completed the training carry out a pilot project and finally get job proposals. Companies and the university collaborate at every stage of the selection procedure receiving mutual benefits. The university must provide the necessary level of objectivity of an assessment, select the skills and indicators most in demand on the labor market. Certification systems, performance analysis in various disciplines, analysis of work in the project, preparation of a psychological portrait, reviews of the program code are used as assessment tools.

IT companies also organize open events and lectures on various aspects of software development. To conduct master classes and lectures, we invite both speakers from IT companies and teachers from leading Belarusian and foreign universities, as well as implement student exchange programs with European universities.

When preparing an IT specialist, it is necessary to study the technologies used in software development as well as to prepare a specialist for work in a development team. In VSTU, the problem is solved by introducing project oriented approach. The project implies a software system development and a student have to apply the knowledge and skills acquired in different courses. This task can be carried out as part of classroom and independent studies of several courses. The teacher in the project training conditions needs to choose a task that will require student to demonstrate most of the skills acquired. This method of training will be especially effective if the developed software system is used in the real sector: to automate the work of the university and other organizations or as a commercial startup. It increases the motivation and responsibility of the student, and also stimulates the application of theoretical knowledge in practice.

Ongoing updating of software development technologies requires not only continuous

updating of training material, but also the development of such qualities as adaptability, self-learning ability, the ability to track trends of development tools and methods, critically evaluate them, highlighting the most promising ones. A very productive approach to teaching students in this context is coaching when the teacher becomes a coach. The trainer helps the student to achieve a professional goal by directing his or her independent search for answers to questions arising during the project work. This approach integrates perfectly with project and problem-oriented learning and is an alternative to the classical methods of independent student work.

Learning a foreign language is important for the future IT specialist, and it is necessary to develop not only the skills of reading special literature, but also speaking and conversational skills, since work in the real sector of developing software systems is most often associated with direct communication with the client. A foreign language teacher must be competent in the field of IT technology. It is also advisable to introduce survey lectures, study of sources and defense of projects in a foreign language. Within the framework of the IESSED international project, VSTU and partner universities have developed courses and training materials in English, which are being tested in the educational process of the university this year.

Today, the Internet has many services for organizing software development. Their capabilities can be used to organize classroom and independent work. Along with the distance learning system of VSTU we also introduce work with other services: visual means of team work organizing (allow to add tasks to the team, track to verify their performance by each of the participants remotely); repository for storing artifacts (allows to organize a repository of work completed, which will be available from any Internet access point); version control system (verification allows to track changes in the source code that each of the project participants made, to evaluate the progress of the project and identify the difficulties students face); social networks (it is convenient to use as a general and personal chat, it is especially important that this improves the efficiency of messaging outside of class); modern code quality control systems or linters (they allow to detect flaws in a workable code automatically, and to set the verification rules yourself, this increases the efficiency of verification, which becomes difficult with a large amount of sources).

A very important task of training IT specialists is the learning path development; in VSTU, the learning path is formed on the basis of the experience of European universities, the experience of the leading developers of our partner IT companies. In this case, additional factors are taken into account: the requirements of the educational standard, which strictly regulate the certain disciplines placement in the curriculum; students' desire to start developing their own project as early as possible; the need to balance the student workload throughout the entire training period. The curriculum of the study programme "Information Systems and Technologies" implements the experience gained by the university in this direction.

VSTU develops the direction of IT specialists training, including by expanding the range

of study programmes. This year the enrollment for a new study programme "Design (virtual environment)" has been announced. The specialists will have competencies in web design, virtual reality and user interface modeling.

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UDC 677.022

RESEARCH OF THE SHRINKING PROCESS OF CORE-SPUN NITRON/ POLYESTER YARN USING MICROWAVE CURRENTS

ИССЛЕДОВАНИЕ ПРОЦЕССА УСАДКИ КОМБИНИРОВАННОЙ НИТРОНОПОЛИЭФИРНОЙ НИТИ С ИСПОЛЬЗОВАНИЕМ ТОКОВ СВЧ

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ABSTRACT

CORE-SPUN YARN, REGRESSION MODEL,
SHRINKAGE, MICROWAVE

The aim of the research is to establish the influence of microwave currents on the shrinkage of the core-spun nitron/polyester yarn. A regression model is constructed that allows predicting the shrinkage of the core-spun nitron/polyester filament depending on the parameters of the wet-heat treatment with microwave currents.

АННОТАЦИЯ

КОМБИНИРОВАННАЯ НИТЬ, РЕГРЕССИОННАЯ МОДЕЛЬ, УСАДКА, СВЧ

Целью проводимых исследований является установления влияния токов СВЧ на усадку комбинированной нитронополиэфирной нити. Построена регрессионная модель, позволяющая спрогнозировать усадку комбинированной нитронополиэфирной нити в зависимости от параметров влажно-тепловой обработки токами СВЧ.

A promising direction in the development of high-volume yarns is to obtain core-spun yarn. The main difference is that, as a highly shrinkable component, a polyester high-shrinkable filament yarn is located in the core of the core-spun yarn and is covered by various types of natural and man-made fibers.

Core-spun yarn is obtained on air jet spinning machine according to the technology developed at VSTU. In our work we used a polyester shrinkage filament yarn as a high-shrinkage component with linear shrinkage, which 42 %, obtained by OJSC SvetlogorskKhimvolokno by the method of physical modification of the linear density of 9.1 tex. As a low shrink component, we used a nitron roving of linear density 950 tex manufactured by OJSC Polesie (Pinsk, Belarus).

Properties of the obtained core-spun yarn are presented in Table 1.

Table 1 – Physical and mechanical properties of the fiber

Indicators	Value
Linear density, tex	40
Raw material composition, %	Polyester– 28 % Nitron – 72 %
Breaking tenacity, cN / tex	15,8
Breaking elongation, %	25,5
Diameter, mm	0,642
Volume, g/cm ³	8,1

The core-spun yarn is subjected to wet-heat treatment with microwave currents under a power of 450-850 W for 60 to 150 seconds.

The results of the experiments are presented in Table 2.

Table 2 – The results of the experiments

Power, W	Time, s	Initial moisture content, %	Shrinkage, %
1	2	3	4
450	60	158,37	9,3
450	90	158,37	9,7
450	120	167,94	12,7
450	150	120,09	15
450	60	282,77	4,8
450	90	225,35	8,7
450	120	225,35	11,7
450	150	215,78	12,3
650	60	139,23	17,7
650	90	167,94	19
650	120	129,66	19,3
650	150	148,80	20,7
650	60	187,08	10,3
650	90	244,49	13,3
650	120	292,34	20
650	150	234,92	25

The end of table 2

1	2	3	3
850	60	158,37	20
850	90	129,66	22
850	120	129,66	25
850	150	139,23	26,3
850	60	225,35	22,7
850	90	244,49	22
850	120	292,34	19
850	150	234,92	32

According to the results of experiments by the method of least squares was obtained the regression model of dependence shrinkage core-spun yarn the initial moisture, microwave radiation power and processing time of the type [3]:

$$S = \frac{t \cdot P \cdot W}{(0.128 \cdot t + 8.31 \cdot (0.149 \cdot P + 677) \cdot (0.218 \cdot W + 0.0698))}, \quad (1)$$

Where: S – shrinkage, %;

t – heat treatment time, s;

P – radiation power, W;

W – relative initial moisture of samples before wet-heat treatment, %.

Figure 1 shows the dependence of the shrinkage of the core-spun nitron/polyester yarn on the process conditions of wet-heat treatment with microwave currents at different Initial moisture content.

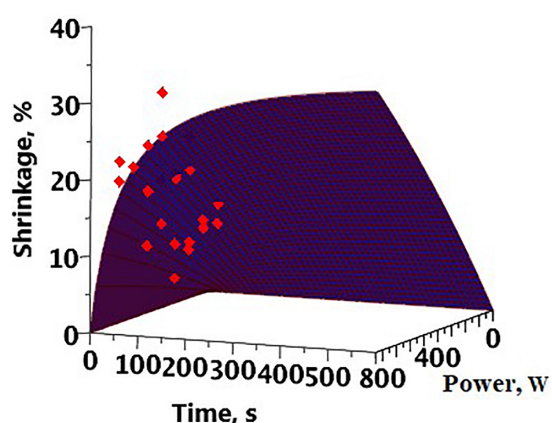


Figure 1 – The dependence of shrinkage on heat treatment at initial moisture content:
1 - 100%, 2 - 150%, 3 - 200%

Figure 2 shows a graph of optimal combinations of operational parameters of the wet-heat treatment of a core-spun nitron/polyester yarn.

The analysis of the obtained dependences allows us to conclude that with the same values of the operating parameters of the heat treatment process, an increase in the initial moisture content of the samples leads to an increase in shrinkage. Shrinkage can be achieved by various combinations of time and power of wet-heat treatment of the initial moisture and microwave power.

Thus, after the experiments the influence of microwave currents on the shrinkage of the nitron/polyester core-spun yarn was established.

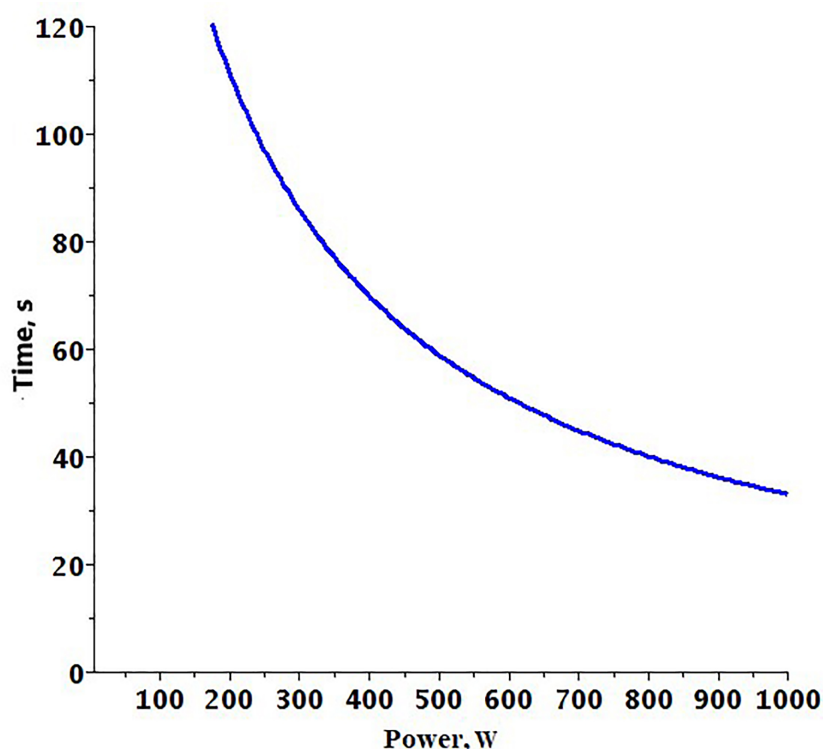


Figure 2 – Graph of optimal combinations of operational parameters of the wet-heat treatment of a nitron/polyester core-spun yarn

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INFLUENCE OF THE LOAD VALUE ON THE TOP ROLLERS OF THE DRAFTING SYSTEM OF THE RING SPINNING MACHINE ON THE YARN QUALITY

ВЛИЯНИЕ ЗНАЧЕНИЯ НАГРУЗКИ НА ВАЛИКИ ВЫТЯЖНОГО ПРИБОРА КОЛЬЦЕПРЯДИЛЬНОЙ МАШИНЫ НА КАЧЕСТВО ПРЯЖИ

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ABSTRACT

LOAD, YARN, GRADE, DRAFTING SYSTEM,
TOP ROLLERS

The experimental work was carried out in the laboratory of the department "Technology of spinning". Samples of yarn were produced on a ring spinning machine with pressures of 98 N, 127 N and 156 N, with the subsequent determination of the physicomachanical properties of the yarn on modern measuring instruments. The recommended values of the load on the top rollers of the drafting system were determined.

АННОТАЦИЯ

НАГРУЗКА, ПРЯЖА, СОРТ, ВЫТЯЖНОЙ
ПРИБОР, НАЖИМНЫЕ ВАЛИКИ

Экспериментальные работы проводились в учебной лаборатории кафедры «Технология шёлка и прядения». Образцы пряжи были выработаны на кольцепрядильной машине при нагрузках 98 Н, 127 Н и 156 Н, с последующим определением физико-механических свойств пряжи на современных измерительных приборах. Были рекомендованы оптимальные значения нагрузки на валики вытяжного прибора.

Currently, the spinning mills of the Republic of Uzbekistan are equipped with high-speed, high-performance ring spinning machines of well-known foreign companies.

Spinning machines and processes carried out on them are quite complicated. To produce high-quality products on these machines and increase their productivity, it is necessary to deeply study and analyze the physical nature of the processes carried out on them, determine the optimal performance of technological processes.

In the process of yarn production, the main attention should be paid to spinning transitions,

and it is also necessary to know well the dependencies between the properties of yarn.

For example, fiber thickness is important during spinning. The property of the yarn produced depends on the thickness of the fiber. Fine, uniform and durable yarn can be made from fine fiber.

From thin yarn produce thin, lightweight fabrics, knitted fabrics. The finer the fiber is, the more fibers in the cross section of the yarn are at the same thickness. Moreover, in the structure of the yarn, the contact area of the fibers with each other increases, which leads to an increase in the friction force, as a result, the strength of the yarn increases. The relative strength of the yarn produced from thick fiber is small. This indicator is sufficiently tangible for thin yarn.

To obtain the required quality during the spinning process of the yarn, a certain amount of fibers should be placed in the cross section of the yarn. When yarn is produced with a minimum linear density, the linear density of the fiber becomes critical. From this it follows that in the cross section of the yarn of the minimum thickness, the minimum number of fibers is variable. In addition, there are also negative aspects to very fine fibers. Such fibers during spinning are the cause of tangling, the formation of neps, as a result, the appearance and quality indicators of yarn are deteriorated.

Along with this, the unevenness of the yarn in thickness is considered the main indicator of quality. Due to unevenness in products, a defect such as banding appears and the appearance worsens. The greater the unevenness of the yarn in linear density, the lower the coefficient of use of the strength of the fibers in the yarn, and in complex yarns – the strength of single yarns, as a result, the mechanical properties of the yarn deteriorate, the number of breaks in weaving and when rewinding the yarn increase.

In a market economy, experimental studies have been conducted to produce high-quality yarn at spinning mills. For this purpose, yarn samples were worked out on a ring spinning machine at various loads on the pressure rollers of the exhaust device 98 N, 127 N and 156 N and their physical and mechanical properties were determined.

The results are shown in Figures 1-3.

Comparing the obtained results with respect to the yarn performance at a load on the pressure rollers of the drafting system of 98 N, the yarn produced at a load of 127 N, the quadratic unevenness in linear density decreased 7.7 %, the quadratic unevenness in twist - 2.1 %, the strength decreased by 21.6 %, the quadratic unevenness in strength increased by 38.1 %, the elongation at break increased by 6.1 % ha, the quadratic unevenness in elongation at break increased by 6.9 %, for yarn produced at a load of 156 N, the quadratic unevenness in linear plane hardening increased by 20.0 %, the quadratic unevenness in twist did not change, the strength decreased by 12.2 %, the quadratic unevenness in strength increased by 33.5 %, the elongation at break increased by 15.6 % ha, the quadratic unevenness in elongation at the break increased by 31.7 %. From this it follows that with an increase in the load on the drafting

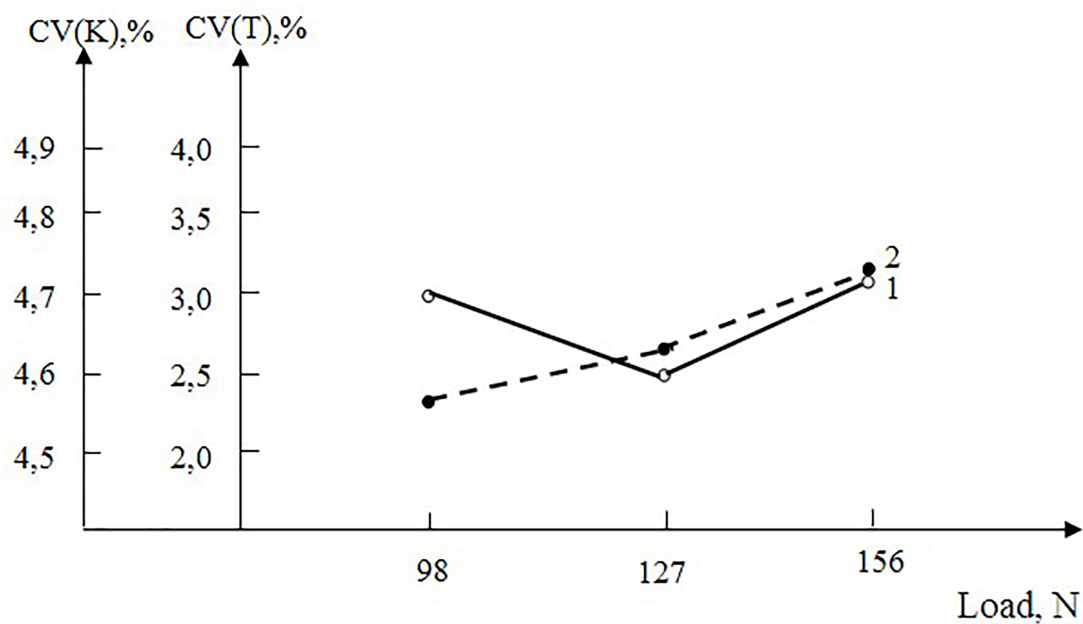


Figure 1 – The influence of the load of the drafting system on the quadratic unevenness of the yarn in linear density and twist
 (1- quadratic unevenness in twist of yarn; 2- the quadratic unevenness of the yarn in linear density)

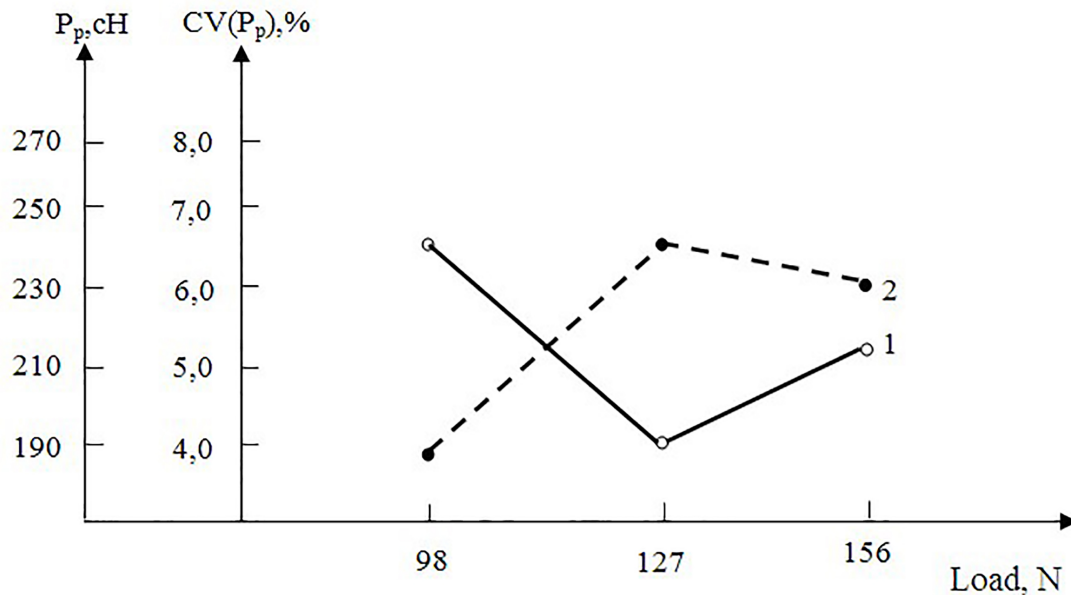


Figure 2 – The influence of the load of the drafting system on the strength of the yarn and the quadratic unevenness in strength;
 (1- strength; 2- quadratic unevenness in strength)

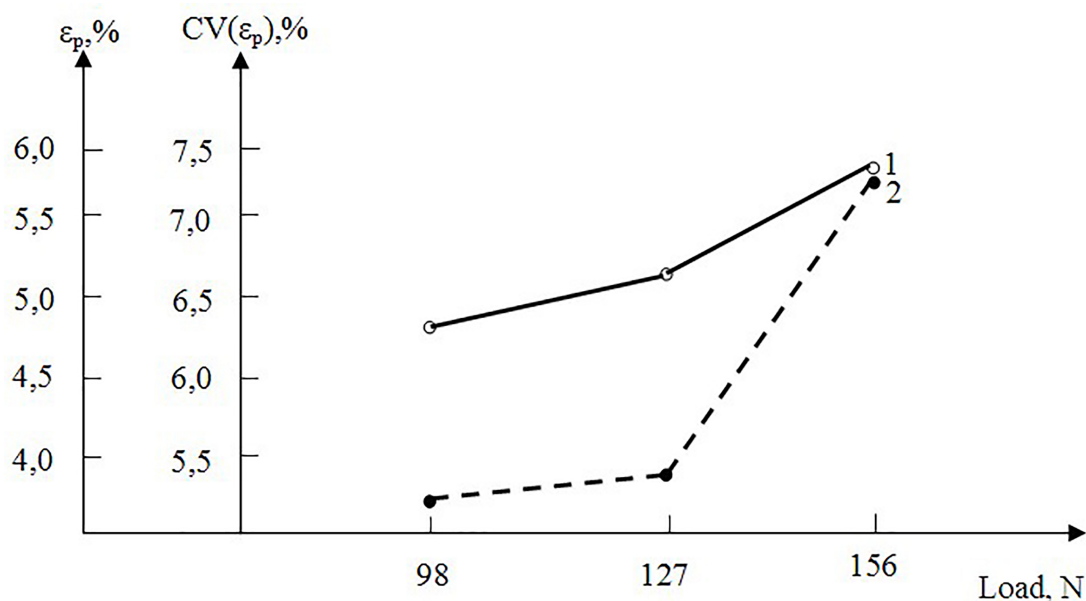


Figure 3 – The influence of the load of the drafting system on the elongation of the yarn at break and the quadratic unevenness on elongation at break (1 - yarn elongation at break; 2- quadratic unevenness in elongation)

system, deterioration in yarn quality indicators is observed.

Drawing a conclusion, we can say that with an increase in load, the quadratic unevenness in the linear density of yarn decreases from 7.7 % to 20.0 %, the quadratic unevenness in twist – 2.1 %, the strength decreased from 12.2 % to 21.6 %, the quadratic unevenness in strength increased from 33.5% to 38.1%, the elongation at break increased from 6.1 % to 15.6 %, the quadratic unevenness in elongation at break increased from 6.9% to 31.7 %.

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UDC 662.6/.9

STUDY OF THE ENVIRONMENTAL IMPACT IN FUEL AND ENERGY COMPLEX OF THE REPUBLIC OF BELARUS

ИЗУЧЕНИЕ ВОЗДЕЙСТВИЙ НА ОКРУЖАЮЩУЮ СРЕДУ ТОПЛИВНО-ЭНЕРГЕТИЧЕСКОГО КОМПЛЕКСА РЕСПУБЛИКИ БЕЛАРУСЬ

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ABSTRACT

ENVIRONMENT, FUEL AND ENERGY COMPLEX, ENERGY SOURCE, THERMAL ELECTRIC STATION, EMISSIONS IN ATMOSPHERE

The general characteristic of the fuel and energy complex of the Republic of Belarus is given. Thermal power plants and their negative impact on the environment, various types of fuel burned for energy production, as well as substances polluting the environment when burning various types of fuel are considered. Alternative energy sources, types of environmental impact of a nuclear power plant are considered. Conclusions are drawn on the topic of publication.

АННОТАЦИЯ

ОКРУЖАЮЩАЯ СРЕДА, ТОПЛИВНО-ЭНЕРГЕТИЧЕСКИЙ КОМПЛЕКС, ИСТОЧНИК ЭНЕРГИИ, ТЕПЛОЭЛЕКТРОСТАНЦИЯ, ВЫБРОСЫ В АТМОСФЕРНЫЙ ВОЗДУХ

Приводится общая характеристика топливно-энергетического комплекса Республики Беларусь. Рассматриваются теплоэлектростанции и их негативное воздействие на окружающую среду, различные виды сжигаемого топлива для производства энергии, а также вещества, загрязняющие окружающую среду при сжигании различных видов топлива. Рассматриваются альтернативные источники энергии, виды воздействия на окружающую среду атомной электростанции. В заключении сделаны выводы по теме публикации.

INTRODUCTION

The object of the research is burning of different types of fuel in fuel and energy complex of Republic of Belarus. The purpose of the work is studying and the analysis of ecological aspects of combustion different types of fuel.

The Republic of Belarus faces a complicated situation with provision of the energy safety

due to a predominant big share of natural gas in power consumption of the Belarusian power system. The power sector is dominated by thermal power generation (more than 95 per cent).

Depending on the characteristics of primary energy resources, used for production of heat and electric power, the energy enterprises at different extent pollute the surrounding ambience by the remainder of its production.

Anthropogenic influence of the energetic objects upon the surrounding ambience possesses many forms. The effect of this may bring changes into the composition and characteristics of the atmosphere, as well as various changes, which are taking place in hydrosphere and lithosphere.

In general there are different from the ecological point of view such types of primary sources of energy, as organic fuel, nuclear fuel, water power, solar energy, wind energy, energy of tide, waves, geothermal energy.

Practically there are no objects, which completely do not influence upon the surrounding ambience. At the same time in no event it is possible to consider all objects of electric energetic branch as ecologically equal.

THERMAL ELECTRIC STATIONS – TES

The greatest number of negative influence is connected with development and usage of the thermal electric station/ operating on organic fuel.

To the main interaction of the TES with the surrounding ambience pertains consumption of fuel, water, oxygen of the air, change of the landscape, as well as any types of emission into all parts of the geosphere.

Together with the smoke gases of the TES into the air pool there are thrown hard and gaseous contaminators, amongst which there are such polluting materials, as ash, oxides of sulphur and nitrogen. Besides them big amount of carbon dioxide is emitted into the air, which is absent in the list of the polluting materials, and water vapors.

The TES emission, thrown into the atmosphere, pollutes the soil and its vegetable cover. The main role in these phenomena belongs to some ingredients, being contained in the emission of the ash: quicksilver, lead, zinc, chromium, arsenic and others. Oxides of nitrogen and sulphur being present in the smoke of gases also may render negative action on the soil, particularly on the vegetable cover.

The negative influence of the TES is aggravated with the fact, that their work must be supplied with constant fuel mining (the fuel base), accompanied with additional negative influence on the surrounding ambience:

- by contamination the air pool, water and land;
- by consumption of land and water resources, by exhaustion of non-recoverable stock of fuel (the natural mineral resources).

Thereby the TES, which is burning organic types of fuel, may adversely affect practically all

spheres of the surrounding ambiances and subject the nature to all considered type of the influence. Their direct influence upon the surrounding ambience very much depends on the established ecological situation. For prevention of the TES negative influence it is obligatory to observe the standards for guarding the natural ambience and safety of the people.

TRADITIONAL FUELS (FOSSIL FUELS, BIOFUEL)

About 90 % of the electricity we need comes from burning fossil fuels such as oil, gas and coal. These resources pollute and are not renewable, so once we have burned them all up, there will be no more.

Billions of tons of coal and oil are consumed around the world every year. When these fuels are burnt, they produce smoke and other by-products, which are emitted into the atmosphere.

Substitution of fuel oil by wood fuel improves the quality of the environment because of reduction of SOX and carbon dioxide.

Environmental impacts of wood energy use and production can be both positive and negative, and an assessment of these impacts should always be part of wood energy policy making.

Acceleration of wood use for energy purposes is crucially affected by many ecological and socio-economic aspects. First of all, in countries that have no fossil fuel wood waste is cheaper fuel than imported fuel. By using wood fuel for energy production in such countries the funds assigned for importing fossil fuel can be saved.

Environmental effect of wood fuel use instead of conventional fuel sources can be assessing by comparing burning products (SO_x, NO_x, CO₂, etc.).

Different fuel sources have different emission of combustible elements. This is dependent on fuel elementary composition and conditions of the combustion process. E.g. emission of particles in solid fuel combustion depends on the capacity of combustion system.

ALTERNATIVE ENERGY SOURCES

The most "clean" production is realized at installations, using solar energy, wind, hydro resources and heat of geothermal wells. However, the share of these sources in covering the need for energy is small, there is no trend of its growth in the nearest prospect, consequently, there are no grounds to expect, that development of the energy branch on the basis of these "clean" sources to some degree will reduce sharpness of the problem for protection of the surrounding ambience.

Nuclear or atomic energy. It is incredible to think that from the nucleus of the atom — one of the smallest things in the world — can come enormous amounts of energy. This energy, which is called nuclear or atomic energy, can either be controlled in nuclear power stations to create electricity for millions of homes, or it can be used in war to destroy millions of homes.

NUCLEAR POWER PLANT – NPP

NPP is a source of four types of impacts affecting the quality of life of the population and the natural environment. These impacts are as follows: radioactive, chemical, thermal and urbanization-related.

When the NPP operates normally, the population and environment are absolutely protected against the NPP radiation impacts; however, in case of any deviations from normal operation, the radiation impact can become the most significant.

Sources of chemical impact on atmosphere include gaseous discharges during operation of the process equipment via ventilation systems and chimneys.

Thereby, in respect of contamination of the air pool with usual chemical contaminants the NPP may be considered as ecological clean objects.

The NPP has advantages over the alternative sources of energy:

- it does not use organic fuel for production of electric power;
- it does not pollute atmosphere with emission of hard particles (created by ash) and different gas-forming materials;
- it does not use oxygen of the air;
- it does not throw hotbed gases into the atmospheric air;
- it does not contaminate land and water facilities with ash-and-slam remainders;
- it does not serve as the source of spreading cancerigenic and even radioactive materials under normal usage (the emission is limited with allowable quota, radioactive waste is localized, concentrated and buried);
- there are absent such phenomena, as raising dust of ash remainders, contamination of atmosphere with products of combustion from ash-and-slam remainders.

CONCLUSION

Environmental protection is of a universal concern. That is why serious measures to create a system of ecological security should be taken. Pollution can be stopped or at least reduced by using fuels which are low in pollution, more complete burning of solid fuels, shift to using alternative forms of power and banning the use of nuclear power.

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UDK 685.34.08

ENVIROMENTAL APPROACH TO RECYCLING OF SHOE POLYURETHANES

ЭКОЛОГИЧЕСКИЙ ПОДХОД К УТИЛИЗАЦИИ ОБУВНЫХ ПОЛИУРЕТАНОВ

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ABSTRACT

FOOTWEAR INDUSTRY, REUSE, WASTE, RECYCLING, REACTIVE APPROACH, PROACTIVE APPROACH, POLYURETHANE

The article deals with reuse and recycling activities in the footwear. A waste management framework and model are described. Processing options of polyurethanes shoe are presented.

АННОТАЦИЯ

ОБУВНАЯ ПРОМЫШЛЕННОСТЬ, ПОВТОРНОЕ ИСПОЛЬЗОВАНИЕ, ОТХОДЫ, ПЕРЕРАБОТКА, РЕАКТИВНЫЙ ПОДХОД, ИНИЦИАТИВНЫЙ ПОДХОД, ПОЛИУРЕТАН

В статье рассмотрены мероприятия по повторному использованию и утилизации отходов в обувной отрасли, описаны структура и модель управления отходами, представлены варианты переработки обувных полиуретанов.

The footwear industry is a diverse manufacturing sector, which employs a wide variety of materials and processes to make products. Leather, synthetic materials, rubber and textile materials are amongst the basic materials most commonly used in shoe manufacture. Each material has its own specific characteristics. These materials differ not only in their appearance but also in their physical qualities, their service life, the different treatment needs as well as their recycling and recovery options at the end of their useful life. There are approximately 40 different materials used in the manufacturing of a shoe [1].

The footwear industry produces different types and styles of footwear. At the moment there are many different styles and categories of shoes. Most of them can be described as having a subset of parts and components. These are common to all types of shoes. The basic parts of a shoe can be grouped broadly into three categories:

- the Upper, which includes all parts of the shoe above the sole;

- the Lower, which refers to the whole bottom of a shoe;
- the Grindery, which includes items that incorporated into the shoe and do not belong either to the Upper or the Lower [2].

The largest share in the cost of shoes comprises leather for upper shoes and materials for the lower of shoes.

One of the main tasks of the footwear industry is improving raw, material and energy efficiency, as well as eliminating the use of hazardous materials during the production phase. The growth efficiency made in production is being overtaken by the considerable increase in the demand for footwear products. This results in a large flow of waste, most of which is disposed in landfills.

Effective management of waste is a rather complex issue made up of many components. The European Commission has set up a waste hierarchy framework [3]. It specifies the order in which waste management options should be based on environment impact. Based on this hierarchy, a waste management framework and model for footwear products was developed[4-6].

The model includes 5 (4) management scenarios: a reuse scenario, 2 disposal scenarios, a burning and use scenario to assess the real problems of shoe waste management.

For each variant, various environmental impacts, economic benefits, and technical requirements needs are to be considered. Disposal is considered the most undesirable option due to the obvious negative environment impact, depletion of resources, increased taxes and, in some countries, the limited availability of waste disposal sites. Burning is still considered a controversial technology, as it entails the emergence of an environmental problem associated with the release of pollutants. Reuse is not possible for all materials of shoe products, so recycling of materials is considered as the most suitable option.

Framework divides the waste management options for shoes into two major approaches: proactive and reactive. Proactive approach include all measures that are taken with the aim to reduce or minimise waste at the source. Reactive approach include all the other waste management options, which act in response to the waste problem.

The main idea of an initiative approach is that it is much more reasonable to reduce or even minimize losses than to develop an extensive treatment regimen and methodology to ensure that the waste does not pose any threat to the environment. In [7] notes that waste minimization activities can range from changes in products and materials to significant changes in processes and methods of operations.

A reactive approach is that the complete elimination of waste is not possible.

Proactive approach includes design improvements and material improvements. Reactive approach includes reuse, recycling, energy recovery and disposal.

However, not all of these methods can be applied when it comes to waste polyurethane foams.

Major ways of polyurethane foam recycling are by mechanical and chemical processes. The mechanical recycling processes for polyurethanes include the following [8-9]:

- Regrinding flexible polyurethane foam into powders to produce new foam;
- Re-bonding into a variety of padding products, including recovered pieces of flexible polyurethane;
- Adhesive pressing is a method, which involves coating the polyurethane granules with a binder and then curing them under elevated temperature and pressure;
- Compression moulding involves subjecting the polyurethane granules to heat and pressure to produce rigid and 3-D parts.

The chemical recycling processes include [9]:

- Glycolysis, which is the method, used to produce polyols from polyurethane waste by reacting polyurethanes with diols at high temperatures;
- Hydrolysis (a reaction of polyurethane with water) is used to produce polyols and amine, intermediates from polyurethane wastes. These intermediates can be re-used to produce other polyurethane components;
- Pyrolysis is the method, which utilizes relatively high temperatures in oxygen-free environment to break down polyurethane and plastics into gas and oil;
- Hydrogenation method is used to produce pure gases and oils through a combination of heat, pressure and hydrogen.

The main directions of the processing of shoe PPU waste are most related to their regeneration by the destruction method, by means of dispersion and by the thermomechanical method [10-12].

The best processing method is considered to be the use of the thermomechanical processing method, which allows solving the problem of waste and giving a tangible economic and environmental effect.

The main options for the production of materials and products for shoe bottoms using polyurethane wastes according to this method, based on numerous studies of VSTU researchers on this issue include the following:

- the technology for producing thermoplastic material from PPU waste suitable for casting processing;
- the technology for producing soles for slippers by preliminary extrusion on a screw extruder and subsequent final molding of the material in the roll gap;
- the technology of obtaining products' liner for the bottom of shoes by recycling waste polyurethane and upper leather raw material waste [10-11].

Currently, work is ongoing in the field of processing and modification of waste polyurethane foams. Received are two basic compositions of reduced density [13], with a fibrous filler. These compositions can be the basis for the production use of bottom parts of shoes: soles, and heels.

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UDC 004.4

THE USE OF CODING METHODS AND SYSTEMS IN THE DEVELOPMENT OF ENCODING CHARACTERS FOR TEXT INFORMATION IN DATABASES

ИСПОЛЬЗОВАНИЕ МЕТОДОВ И СИСТЕМ КОДИРОВАНИЯ ПРИ РАЗРАБОТКЕ КОДИРУЮЩИХ СИМВОЛОВ ДЛЯ ТЕКСТОВОЙ ИНФОРМАЦИИ В БАЗАХ ДАННЫХ

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ABSTRACT

DATABASES, DATA TYPES, SOFTWARE

Today, to increase productivity and significantly reduce costs, automatic identification technologies are used, the main ones being the following: bar coding; radio frequency systems; optical character recognition; machine vision (computational methods of image processing); speech data entry and a number of others. Encoding characters provide quick access to the characteristics of the object and simplify the processing of text information.

АННОТАЦИЯ

БАЗЫ ДАННЫХ, ТИПЫ ДАННЫХ, ПРОГРАММНОЕ ОБЕСПЕЧЕНИЕ

Сегодня для повышения производительности труда и существенного снижения затрат используются технологии автоматической идентификации, основные из них: штриховое кодирование; радиочастотные системы; оптическое распознавание знаков; машинное зрение (вычислительные методы обработки изображения); речевой ввод данных и ряд других. Кодированные символы обеспечивают быстрый доступ к характеристикам объекта и упрощают обработку текстовой информации.

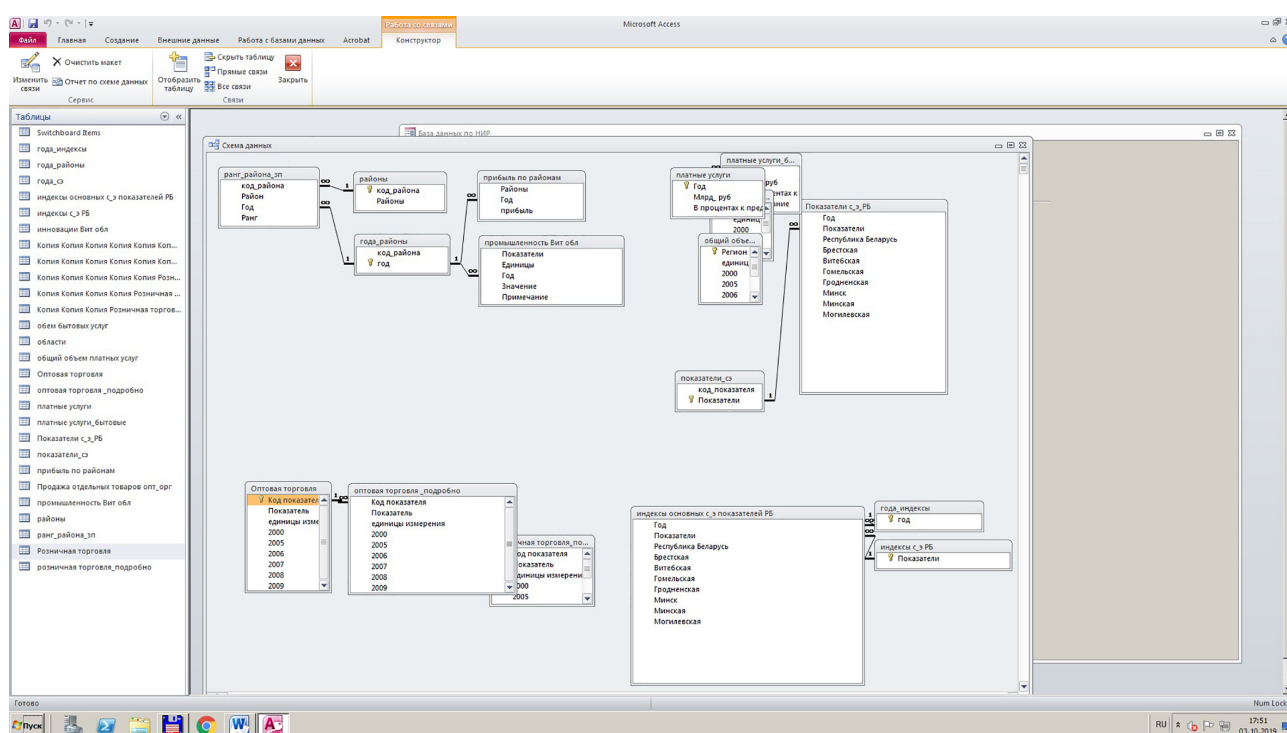
For effective production management, product quality improvement and organization of accounting there must be timely and accurate control of objects.

The primary collection of information requires the development of a system of identification of various types of objects (goods, documents, tools, etc.). To solve this problem, it is necessary to determine the systems and methods of identification of objects or three-dimensional text characteristics.

Many of the characteristics of objects are text information. Text information is difficult to convert to binary code because of the variety of characters and length. Each character in the text is encoded in one byte. A lot of automation resources are spent on translation and restoration of text information. Working with this type is difficult: distortion when entering; inaccuracies when adjusting; character-by-character work when searching and comparing.

For the rational operation of software with long texts, coding is used. Encoding characters replace many text characteristics and make it easier to process text data. In everyday life, we often encounter coded information, for example, the number of the group of students replaces the following information: the code and the full name of the specialty, faculty, course; student ID number (the grade book) uniquely identifies the student among all students of the Republic of Belarus. It often happens that the encoded information is more convenient to familiarize with the amount of data and is better perceived visually.

When developing an information-logical database model, encoding characters are actively used for field names, individual objects and/or object characteristics. Regardless of the direction of the developed SOFTWARE (software), the basic requirements for information are: adequacy, reliability, completeness, objectivity and accuracy.



**Figure 1 – Fragment of the data scheme using the area code field
(in the development of the database of economic indicators of Vitebsk region)**

Development of code and code directories begins with the initial collection of information in the design of the information system. Often there is a need to assign each object a number

(code), followed by the application of this number on the object for reading by digital devices. To streamline the coding symbols used by the classifiers. When encoding text information as a basis, you can take existing classifiers, which are known in many fields of activity.

When designing the information system software, the following actions are performed:

- definition of the list of necessary indicators;
- calculation of space-time characteristics of indicators;
- identification of existing information links;
- development of database structure and composition;
- study of existing classifiers: industry, government, etc.;
- development of new codes and classifiers or adaptation of existing ones;
- structural organization and visual design of forms for different purposes.

To logically describe data structures, identifiers are used, i.e. symbols that characterize individual units of information and show their place, level and relationship in the overall system. The purpose of identification is a simplified description of data and processing algorithms. There are systemic, structural and procedural ways of identification. At system identification the full list of information units is made: details, indicators, forms of documents to which symbols on all positions at the level of system are appropriated; at structural level each information unit on the basis of its coordinates in structure of documents or carriers; at procedural – within separate block diagrams, modules and programs.

Special graphical symbols of operations are used to describe information transformation procedures and algorithms.

Encoding of information has always been paid attention to when working with large arrays of objects. Two methods of classification are developed: hierarchical and faceted. There are four encoding methods: sequential, batch-sequential, sequential, parallel. Each method when used has its positive and negative sides.

The ordinal method is characterized by its simplicity, but it does not allow you to skip the encoding numbers and insert the encoding characters into the formed series.

The serial-order method allows extensions of certain groups to be performed, which is sometimes necessary when the number of objects increases, but is not able to preserve the structure when the number of groups increases.

The sequential method is characterized by hierarchical organization of data with strictly defined features (characteristics) of objects at each level. This method is effective when using large groups of objects of different types. In programming, this structure is used in class diagrams.

When working with large items, it is more rational to use the parallel method. It is necessary to develop a coding structure, which is a disadvantage.

The choice of coding method is influenced by the purpose and conditions of use of the information system. The structure of the code should be simple and logically clear, because it

may be necessary to automate the coding process. The coding system should provide for an increase in the list of objects and the expansion of the set of characteristics characteristic of the operating conditions of the software. Typically, an electronic information system provides a mechanism for the development of validation codes.

The method and structure of the formation of code symbols of the object or feature should be reflected in electronic directories, develop explanations and reference information for users. The local coding system should not create conflicts and mislead users, if there are already established encoding character combinations in this area.

The historical system can be taken as a basis and refined, even if it contradicts the principle of efficiency. In this situation, it is very rational to approach the assessment of the situation, because users of the system should not work for the sake of software, and it should provide them with convenient and comfortable working conditions with information.

Local classifiers with stable information are electronic directories. The stability coefficient is determined by the ratio of the amount of changed information to the total amount of data for a certain period. According to the coefficient of stability, if it is greater than 0.5, the normative reference information for its repeated use is presented in electronic form.

If you need a stable storage of information for a long period of requirements for the encoding mechanism increases significantly. Thoughtful and high-quality solution for encoding text or volume information simplifies the design and commissioning of the next version of the information system.

It is not difficult to imagine how effective the use of automated input of initial information in enterprises, wholesale bases, supermarkets. Coding of objects using computer technology makes it possible to organize effective work on the processing of interconnected arrays of information.

In the study we can conclude that the design of automated information processing it is necessary to encode text data types and to develop a mechanism for compiling a synthesis of code names for selected volumes of information. Identification of objects by code allows: rational use of SOFTWARE and hardware capabilities; organize effective control and accounting; avoid losses or inaccuracies in the output, analysis or editing of text characteristics. In the economic sphere, a quick search, counting, selection of goods or the output of all information about the product can improve the quality of customer service; optimally perform warehouse work; efficiently use vehicles; perform inventory control and reduce the time of work with documents.

UDC 747

DESIGN-PROJECT OF SCHOOL MUSEUM

ДИЗАЙН-ПРОЕКТ ШКОЛЬНОГО МУЗЕЯ

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ABSTRACT

SCHOOL MUSEUM, DESIGN PROJECT, SOCIAL SPACE, EXHIBITION SPACE, ZONING, LEARNING SPACE

With use of modern information technologies and packets of application graphic programs the design project of social space of a modern type – the school museum is – developed. Upgrade of the existing premises in Secondary School № 34 of Vitebsk is made.

АННОТАЦИЯ

ШКОЛЬНЫЙ МУЗЕЙ, ДИЗАЙН-ПРОЕКТ, СОЦИАЛЬНОЕ ПРОСТРАНСТВО, ВЫСТАВОЧНОЕ ПРОСТРАНСТВО, ЗОНИРОВАНИЕ, ОБУЧАЮЩЕЕ ПРОСТРАНСТВО

С использованием современных информационных технологий и пакетов прикладных графических программ разработан дизайн-проект современного вида социального пространства – школьного музея. Произведена модернизация существующего помещения ГУО «Средняя школа № 34 г. Витебска».

The topic of scientific and research work is the design project of the social space in Secondary School № 34 of Vitebsk.

Relevance of the topic: it is necessary to move from the concept of contemplation to the concept of participation. The object of the study is the school museum. Method of research: literature-review and analytical.

The aim of the project is to create a design project of the social space in Secondary School № 34 of Vitebsk at a high aesthetic level, with compliance with the necessary functional, ergonomic and social requirements.

The practical objectives to achieve this goal are the following:

- to study the analogues of school museums in the Republic of Belarus and abroad;
- to define design requirements for exhibition spaces;
- to develop a general concept of the project, taking into account the characteristics of the

institution;

- to consider the structure of the organized space, its zoning,
- to provide expressiveness of the exposition zone;
- to select materials and exhibition equipment;
- to develop aesthetically attractive space within the framework of artistic co-activity, with the prevailing disclosure of the exposed material, artistic solution of the exposition.

Having studied the set tasks from the school management, it was established that the room should be divided into the following functional zones: exhibition, used for placement of expositions, and information and business, intended for carrying out business, educational and entertainment events within the framework of the exhibition. Exposed material - text, graphic documents, certificates, photographs, cups and medals. Therefore, it is decided to use curtain pockets of acrylic of different sizes and a gallery system to demonstrate exhibitions as equipment, which will give a feeling of ease and emptiness. The use of such a system will make the exhibition mobile and more diverse; will allow to quickly change the exposition as necessary.

The development of the project concept includes stylistic and color solution of the interior, selection and development of furniture and equipment, lighting fixtures and finishing materials at the stage of the sketch proposal. The main direction is minimalism. The design uses monotony of coatings and simplicity of geometric shapes, modern materials, and wood. Light tones of wall and floor coatings create free space in the room.

The novelty and feature of the project is the application of modern technologies in the organization of the interior: the use of the reception of the connection of the ceiling cube-shaped rack floor with the general interior. A fundamentally new project for Belarusian school museums is the organization of a space for events using multimedia equipment, the use of transformer furniture and the creation of mobile furniture for use during the lecture, as well as a storage system.

As a decorative component of the exhibition space, it is decided to include the use of text graphics on the walls in Latin in German. The school collaborates with German schools, participates in the students exchange program and this specificity, reflected in the schedule, will contribute to the pupils' interest in learning the language and achieving results.

For the room for events, views of scientific films a rack with a closing façade was developed. Its main function is to store furniture and equipment.

The event area are also intend for viewing video material using a projector, projecting the image on a special retractable screen. At the same time blackout curtains are used, which creates a complete immersion in the atmosphere of the cinema. There is also a wooden panel with a graphic image of a map of Germany. It comes with special stickers. Pupils celebrate the cities they visited. Areas of Germany in which the school has already cooperated are marked on the map with colored areas, the color of which chosen to support designed puffs (Fig. 1).



Figure 1 – Visualization of the museum premises in Secondary School № 34 of Vitebsk

The practical significance of scientific work is that the creation of the social space in Secondary School № 34 of Vitebsk will solve the problem of increasing the efficiency of the educational and educational process, developing cognitive and creative activity of students, building their skills of value-oriented attitude to historical and cultural heritage, and joining it.

The project was introduced into the educational process of VSTU and in practice in the existing interior of Secondary School № 34 of Vitebsk from materials manufactured in the territory of the Republic of Belarus.

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INTERACTIVE APPLICATION FOR CALCULATING THE RELIABILITY OF PRODUCTS OF LIGHT INDUSTRY

ИНТЕРАКТИВНОЕ ПРИЛОЖЕНИЕ ДЛЯ РАСЧЕТА НАДЕЖНОСТИ ИЗДЕЛИЙ ЛЕГКОЙ ПРОМЫШЛЕННОСТИ

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ABSTRACT

PRODUCT RELIABILITY, FAILURE RATE, AVAILABILITY, COMPETITIVENESS, MACRO PROGRAMMING

The concept of "product reliability" is considered in the article. A definition of this concept is given and the classification of reliability properties is listed. The concepts of gradual and sudden failures, the causes of their appearance and general features are studied. The possibilities of calculating and analyzing the level of reliability of light industry products using the MS Excel spreadsheet processor are considered.

АННОТАЦИЯ

НАДЕЖНОСТЬ ИЗДЕЛИЙ, ИНТЕНСИВНОСТЬ ОТКАЗОВ, РАБОТОСПОСОБНОСТЬ, КОНКУРЕНТОСПОСОБНОСТЬ, МАКРОПРОГРАММИРОВАНИЕ

В статье рассмотрено понятие «надежность изделия»: дано определение этого понятия и перечислена классификация свойств надежности. Изучены понятия постепенных и внезапных отказов, причины их появления и общие черты. Рассмотрены возможности расчета и анализа уровня надежности изделий легкой промышленности с помощью табличного процессора MS Excel.

Reliability is one of the key indicators characterizing the competitiveness of light industry products. This is the ability of the product to perform predetermined functions, while preserving over time the values of the established operational indicators within predetermined limits. Due to the processes that occur during storage, consumption or operation of goods, the reliability of products is constantly changing. [1]

Reliability of goods is a complex property, which is divided into simpler ones: reliability, durability, maintainability and storage. All these properties are determined by the ability of the product to maintain its use value over time. [3]

The aim of the study is to develop interactive software that automates the calculation of the reliability of light industry products.

The object of research is the products of the Belarusian leather and footwear company Marko.

Research tools are MS Excel spreadsheet processor, macro programming technology.

The objective of the study is, using the developed software application, to calculate and analyze the probability of occurrence of a failure (malfunction) based on experimentally obtained initial data. In this case, the probability of occurrence of a failure within a certain interval of operation (consumption) of the product (product) is considered.

By the nature of the occurrence, failures can be gradual and sudden. Failures are usually caused by slow degradation of goods, wear and tear of materials. Sudden failures appear in a sharp, unexpected change in any product parameters, as well as in the presence of defects in the products. [4] Unlike gradual failures, sudden failures are usually not preceded by any signs that may indicate the possibility of their manifestation. Despite the difference in the causes of failures, they have a common feature - the randomness of occurrence, which can be explained using probability theory and mathematical statistics.

Failure rate is the ratio of the number of failed objects per a time unit to the average number of objects that are working properly in a given period of time, provided that the failed objects are not restored and are not replaced by healthy ones.

The main page of the application (Figure 1) allows the user to select the necessary type of product for calculating reliability and go to the corresponding sheet of the workbook. Macro programming technologies and a set of hyperlinks were used to automate the transition. [2]

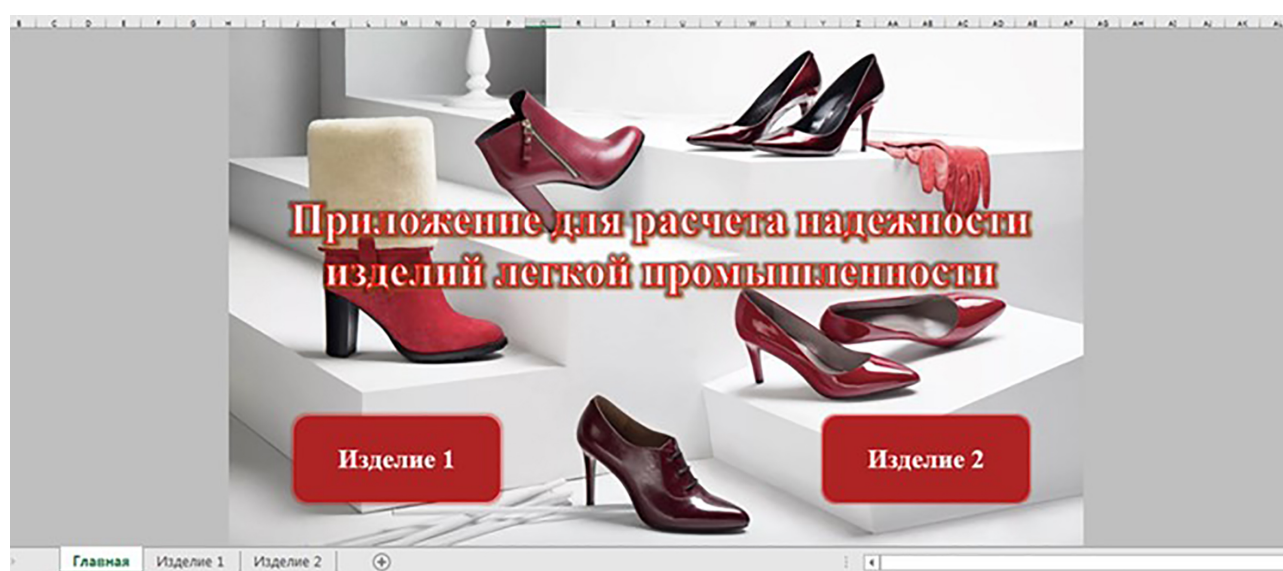


Figure 1 – The interface (main page) of MS Excel

An example of calculating the numerical characteristics of a random variable, the results of intermediate calculations of the reliability of the product, a conclusion on the likely time of failure is presented in Figure 2.

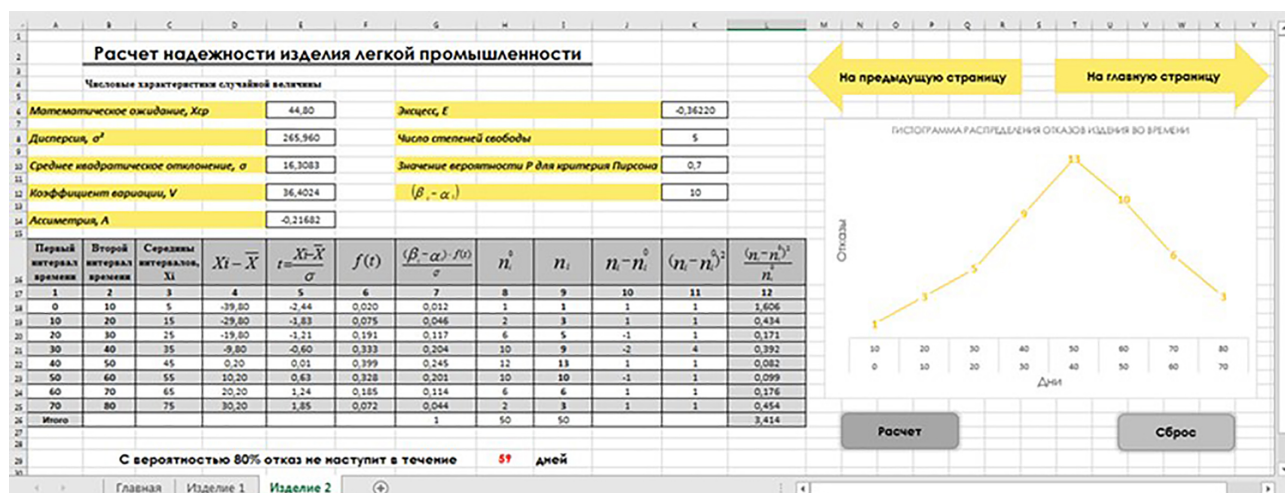


Figure 2 – The interface (main page) of MS Excel

To automate the calculation, macros are introduced that allow both to perform calculations using the appropriate algorithms and reset the original data. Each macro is activated using the corresponding control (button). To implement the algorithm for calculating reliability indicators, the built-in functions of MS Excel TP of the categories "mathematical" and "statistical" are used. Visually assess the interval distribution of product failures using the graph (Figure 2).

The developed software application has the following advantages:

1. Versatility. The ability to calculate the reliability of various types of products based on different sets of source data.
2. Ease of use. Using the application does not require additional skills.
3. Automation of calculations. The application is fully automated, the user needs to enter only the source data.
4. Social significance – improving the working conditions of specialists in the marketing department.
5. Practical focus. This application can be used to develop practical skills in professional and educational activities.

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UDC 747

INTERIOR PROJECT OF CHILDREN 'S ART SCHOOL

ПРОЕКТ ИНТЕРЬЕРОВ ДЕТСКОЙ ХУДОЖЕСТВЕННОЙ ШКОЛЫ

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ABSTRACT

SCHOOL OF ARTS, DESIGN PROJECT, MODERNIST STYLE, OFFICE OF THE DRAWING AND PAINTING, GUSTAV KLIMT

The result of scientific research and design findings is a design project of the interiors of adjacent premises at Borisov School of Art: drawing and painting study, teacher's room, locker rooms for students and exhibition area, as well as a place of storage of equipment and students' works was developed.

The purpose of the work is to modernize the existing premises of Borisov School of Arts. Objectives are to study and analyze similar premises in arts schools in the near and far abroad; to develop a corporate style and design of the interiors of the drawing-painting study, the teacher's room and the place of storage of the equipment; to offer the necessary number of places for storage of art equipment and works; identify suitable materials and equipment; create an open, creative environment for both employees and school students.

Object of research is subject-space environment of the studies of School of Arts.

The history of the emergence of schools of arts has been studied, research work has been carried out to find analogues and to identify the main requirements for zoning the premises in the near and far abroad. It has been established that in this kind of schools there are offices used for classes in several subjects at once, in particular work in material and cake, drawing and painting.

АННОТАЦИЯ

ШКОЛА ИСКУССТВ, ДИЗАЙН-ПРОЕКТ, МОДЕРН, КАБИНЕТ РИСУНКА И ЖИВОПИСИ, ГУСТАВ КЛИМТ

В результате научных исследований и проектных поисков выполнен дизайн-проект интерьеров смежных помещений в школе искусств г. Борисова: кабинета рисунка и живописи, кабинета учителя, раздевалки для учащихся и выставочной зоны, а также разработано место хранения инвентаря и фондов работ учащихся.

The design provides ergonomic requirements, which are designed to ensure maximum comfort of students.

The subject-space environment of the project is divided into six zones: a locker room for students and a waiting place for the lesson; drawing and painting studies; corridor that divides the study room, the teacher's office, the vault and the cleaning area. It is decided that it is in this zone that students' works to be shown on the walls. Then there is the teacher's office, where personal things and working equipment are stored, as well as the area of storage of students' personal things and the bathroom (Fig. 1).



Figure 1 – Interior project of children's art school

Equipment is used in the form of wheels, manufactured by the Republic of Belarus and designed inks that are stacked with each other and do not take up much space. Colored racks are made, which in addition to the utilitarian function, acting as a place of storage of working equipment, also perform aesthetic function, an important part of the interior. The study room is divided into two zones: a place for work at the lesson of drawing and painting, as well as a part for familiarization with the theoretical material of the lesson. For this purpose there is a projector with a screen on the left side of the study room used for presentations and training, which is a feature of the project.

It has been determined that the use of supergraphs in the interior to create a corporate style of the room is relevant. Therefore, it was decided to conclude the idea of the project in the creation of a corporate style with elements of illustrations of paintings of the representative of a modernist G. Climt.

In the design part, a rack structure is developed, which is a frame of metal profile pipes, into which steel sheets are inserted, which act as shelves.

The project is virtually significant as the development of the interiors of a particular art school of the arts. For its implementation, modern construction and finishing materials are chosen, which have excellent operational and technical, and aesthetic qualities. Efficiency

is determined by attracting increased attention to the organization of the interior of the premises, in the artistic and aesthetic education of gifted and creative children. The work is implemented in the studying process of in VSTU, and presented at exhibitions.

UDC 687.016

MEASUREMENT OF DESIGN PARAMETERS OF THE FINISHED GARMENT BY THE NON-CONTACT METHOD

ИЗМЕРЕНИЕ КОНСТРУКТИВНЫХ ПАРАМЕТРОВ ГОТОВОГО ШВЕЙНОГО ИЗДЕЛИЯ БЕСКОНТАКТНЫМ МЕТОДОМ

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ABSTRACT

3D SCANNING, VIRTUAL DESIGN, VIRTUAL FITTING, CONSTRUCTIVE PARAMETERS

The article describes the process of constructing a drawing of the initial model design of a conical female skirt based on data obtained as a result of scanning a finished garment using a 3D scanner. An iterative algorithm is proposed that allows you to automatically find the outline of a three-dimensional computer model separating the details of the belt and skirt. The developed software module for the Rhinoceros 5 computer-aided design system is described.

Currently, 3D scanners [1-3], devices that allow for the use of optical sensors to create a three-dimensional computer model of the human body, are becoming increasingly popular for measuring the dimensional characteristics of a human figure. One of the promising areas for the use of three-dimensional models of the human body is the creation of virtual fitting rooms, allowing you to choose clothes that correspond to the anatomical features of a person, without a real fitting [4, 5].

Virtual fitting requires both a three-dimensional scan of a human figure and a digital model of the product being tested. A digital model of a garment can be built on the basis of information about the geometric dimensions of its constituent parts (design model drawing) [6]. Such information is part of the design documentation, which, as a rule, is the trade secret of the manufacturer and is not available for retail. At the same time, trade enterprises have a large number of ready-made clothes of interest for virtual fitting. Thus, the urgent task of creating digital computer models of clothing based on ready-made samples containing information about the required geometric dimensions. This problem can be solved by 3D scanning of finished clothes and measuring the geometric dimensions on the resulting 3D model.

As part of this work, we studied the possibilities of constructing a digital model of a conical female skirt using a 3D scanner [7], which consists of a rack with four Kinect sensors [8-10] installed on it and a turntable. The data obtained during scanning was processed using the Rhinoceros 5 computer-aided design system [11]. To automate the process of measuring spatial objects using a three-dimensional model, a specialized module was developed in the environment of the editor of graphic algorithms Grasshopper [12].

Figure 1a shows the appearance of a conical skirt marked in XS size and dressed in a size 44 mannequin.

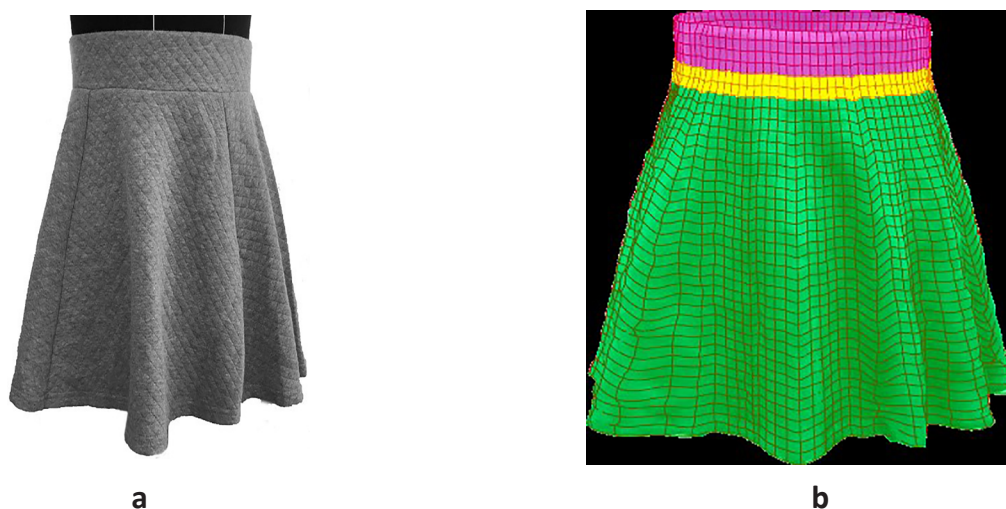


Figure 1

Using the technology of three-dimensional scanning, a three-dimensional computer model of the clothing surface was obtained (Fig. 1b).

Figure 1b shows the area in which there is a contour separating the details of the belt and skirt. The horizontal line corresponds to the area of the belt, the inclined line corresponds to the area of the skirt.

A software product is developed that allows, based on the data obtained as a result of scanning a finished garment using a 3D scanner, to draw a drawing of the original model of a conical female skirt.

An iterative algorithm is proposed that allows to automatically find the contour number of a three-dimensional computer model separating the details of the belt and skirt of a female conical skirt.

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Section 2. SOCIAL, HUMANITARIAN AND ECONOMIC PROBLEMS OF EDUCATION AND SCIENCE DEVELOPMENT IN THE 21TH CENTURY

UDC 331.1; JEL Classification: J300

LLABOUR COSTS IN THE ORGANIZATION IN A DIGITAL ECONOMY

ЗАТРАТЫ НА ПЕРСОНАЛ В ОРГАНИЗАЦИИ В ЦИФРОВОЙ ЭКОНОМИКЕ

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ABSTRACT

LABOUR COSTS, LABOUR COSTS STRUCTURE, LABOUR COSTS MANAGEMENT, DIGITAL TRANSFORMATION, DIGITAL ECONOMY

This article discusses the key prerequisites, technologies and processes of digital transformation taking place at enterprises, as well as the issues of their impact on labour costs at the micro level in the context of building a digital economy in Belarus. Based on a generalization of the experience of digital transformation of Russian enterprises, taking into account foreign experts research, the author concludes that digital transformation is gradual process, it requires investment and staff readiness, and, contrary to expectations, does not lead to a significant reduction in staff. To successfully completion the digital transformation, it is necessary

АННОТАЦИЯ

ЗАТРАТЫ НА ПЕРСОНАЛ, СТРУКТУРА ЗАТРАТ НА ПЕРСОНАЛ, УПРАВЛЕНИЕ ЗАТРАТАМИ НА ПЕРСОНАЛ, ЦИФРОВАЯ ТРАНСФОРМАЦИЯ, ЦИФРОВАЯ ЭКОНОМИКА

В статье рассматриваются ключевые предпосылки, технологии и процессы цифровой трансформации, происходящие на предприятиях, а также вопросы их влияния на затраты на персонал на микроуровне в контексте построения цифровой экономики в Беларуси. На основе обобщения опыта цифровой трансформации российских предприятий, а также исследований зарубежных специалистов автор приходит к выводу, что цифровая трансформация происходит постепенно, требует инвестиций и готовности сотрудников и, вопреки ожиданиям, не приводит к значительному сокращению персонала. Для успешного завершения цифровой трансформации необходимо консоли-

to consolidate the efforts of enterprises and personnel, as well as to develop hybrid work skills based on the complementarity of machines and people.

дировать усилия предприятий и персонала, а также формировать навыки гибридной работы на основе взаимодополняемости машин и людей

The digital transformation of the economy is currently considered as one of the key means for economic growth stimulating in a number of developed and developing countries. Digital transformation refers to all economic activities using the Internet as a platform and digital information and knowledge as key inputs for the process of producing, marketing and distributing goods and services. The concept is also defined as the economic processes made possible thanks to the existence of, and interaction with, the Internet, mobile networks and information technologies [1].

The key prerequisites for digital transformation and the diffusion of digital technologies in all areas of the economy are the progressive growth of the capabilities and power of computer technology while reducing its cost; increased availability of high-speed data transmission. Digital transformation is based on advanced digital technologies such as big data analytics, artificial intelligence, robotics, augmented reality, mobile technologies, the Internet of things (IoT), additive technologies, cloud technologies and other. A complex of these technologies arises the synergy effect and ensures a significant increase in the company's competitiveness. However, the application of these technologies requires enterprises investment and employees training in their practical use.

The Republic of Belarus has chosen a course towards a digital economy, which is in line with global trends. On December 21, 2017, the Decree of the President of the Republic of Belarus No. 8 "On the development of the digital economy" was signed, according to it the High-Tech Park became a pilot project for the country in the field of digitalization of the economy. In accordance with the Decree of the Government of Belarus No. 167 of February 28, 2018, the Republic of Belarus created the Council for the Digital Economy Development, that defines the goals and objectives of the digital transformation of the national economy and sets the priorities for the introduction of digital technologies for the manufacturing sectors, trade and services, and the social sphere as well, taking into account the latest ICT achievements and the development of the global digital space. The Council's tasks also include: a favorable legal and regulatory environment supporting for the development of the national digital economy; stimulating the advanced digital technologies transition in various fields of economy and public relations.

Digital transformation has a significant impact on the labour relations and workplace: jobs and professions of people whose work can be programmed disappear; professions related to creativity, research, innovation, etc. come in their place; a person is released from the sphere of monotonous labor into the sphere of creative activity; labor becomes hybrid (involves the

interaction of man and machine to obtain a new quality and productivity of processes). New forms of labor relations are appearing, its existence is possible only thanks to the advent of geolocation, ICT-based digital platforms and mobile applications: crowd working, gig working, virtual work, on-call work and so on. Thus, the effective interaction of man and digital technologies becomes the key to maintaining his competitiveness in the labor market, as well as a condition for the successful completion of digital transformation [2, 3].

According to the results of a global study conducted in 2018 by one of the largest audit firms in the world KPMG, 95 % of the industrial enterprises CEOs consider digital transformation as an opportunity to increase labor productivity and business development. Similar results are presented in a joint study by Hitachi Data Systems and the OSP Data analytical group, conducted at the end of 2016 in the Russian Federation (95% of respondents use or study the possibilities of using digital technologies in business) [4].

It should be noted that the above-mentioned studies were mainly attended by representatives of large businesses, occupying a leading position in the industries. So, according to the KPMG survey, about 60 % of industrial enterprises in the world already have a developed digital transformation program. A quarter of them expect to implement such a program in less than a year, the rest in a period of up to 3 years.

The enterprises mainly carry out digital transformation gradually, accumulate potential by testing the digital technologies in several processes or pilot projects. Only 19 % of respondents said that they are implementing a digital transformation throughout the enterprise. Thus, the digital transformation in practice rather serves as a means of sustainable development and long-term survival, than forms the basis for economic growth.

Small and medium-sized enterprises (SMEs), according to experts, lag behind market leaders and large players in digital transformation for the following reasons: lack of competencies in the field of digital technologies; the effect of economies of scale on industry that works against SMEs; lack of funds to finance the implementation of digital technologies, etc. Digital transformation at the micro level is the process of an enterprise transfer to a “flexible” state from the current one. For its successful completion, not only financial resources are needed, but also the competence of using digital technologies in daily work.

Numerous fears about reducing need for staff in the context of digital transformation are not justified in practice. According to Valenduc, Vendramin, “although this new technological order has resulted in a shift in the boundary between human and machine capabilities, it would be at the very least premature, if not entirely wrong, to conclude that human labour will soon be replaced by machines; instead, the future should be envisaged and built on the basis of complementarity” [3].

Business leaders note that the emergence of new jobs as a result of digital transformation exceeds the number of employees freed up by reducing the complexity of automated operations and processes. However, digital transformation requires new competencies from

employees. Thus, staff costs may even increase, especially during the transition period.

However, many employees involved in labor processes today do not have the knowledge, skills and competencies necessary to build up a digital economy. Joint efforts of workers and employers are required, as well as additional investments from enterprises to attract and retain highly qualified personnel, create conditions for their development and maintain high productivity. Therefore, digital transformation must include the development of new competencies of employees, as well as incentives for their self-development by staff.

The working time freed up as a result of the digital transformation may be used to the digital skills development, which can then be used in other processes. This approach will minimize the loss of personnel during the transformation and at the same time use the economic effect of the transformation for a gradual transition to a digital model of the enterprise.

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BRANDING OF THE REGION IN THE RESIDENTIAL NATURE-CLIMATIC ZONE BY THE EXAMPLE OF VITEBSK REGION

БРЕНДИНГ РЕГИОНА В КУРОРТНОЙ ПРИРОДО-КЛИМАТИЧЕСКОЙ ЗОНЕ НА ПРИМЕРЕ ВИТЕБСКОЙ ОБЛАСТИ

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ABSTRACT

BRANDING OF THE REGION, VITEBSK REGION, NATURE AND CULTURE OF THE VITEBSK REGION, TOURISM, FEATURES OF THE VITEBSK REGION

The article considers the relevance of the development of branding of the territory; the main postulates of the effective development of territorial branding are formulated; features of the tourism sector of the Vitebsk region are presented. The analysis of the tourism sector of the Vitebsk region at the end of 2018 is given. A complete description of the Vitebsk region is given, given the geographical location, transport links, environmental features and also some economic aspects.

АННОТАЦИЯ

БРЕНДИНГ РЕГИОНА, ВИТЕБСКАЯ ОБЛАСТЬ, ПРИРОДА И КУЛЬТУРА ВИТЕБСКОЙ ОБЛАСТИ, ТУРИЗМ, ОСОБЕННОСТИ ВИТЕБСКОЙ ОБЛАСТИ

В статье рассматривается актуальность развития брэндинга территории; сформулированы основные постулаты эффективного развития территориального брэндинга; представлены особенности туристической сферы Витебской области; приведен анализ сферы туризма Витебской области на конец 2018 года; дана полная характеристика Витебского региона, учитывая географическое местоположение, транспортное сообщение, экологические особенности, а также некоторые экономические аспекты.

For more than 15 years the Republic of Belarus is living in depopulation: in the period between In conditions of fierce competition between the regions, branding in Belarus is becoming increasingly important. This is primarily due to the orientation of investors, tourists, buyers of goods and services on the image of the region and its positioning [1].

It should be noted that the effective development of territorial branding is based on a

number of postulates [2].

Firstly, it is a state order policy (since local government bodies act as the customer in territorial branding), based largely on the opinion of the region's residents.

Secondly, the use of modern research methods (content analysis, a survey of experts in marketing and branding, residents of the region, expert interviews, etc.) and communication practices as tools for building a territorial brand.

Thirdly, it is the development of an effective PR-strategy (SMM-promotion, "link to authorities", organization of large-scale events, etc.), which allows positioning the region with the parties most attractive to the target audience and, thereby, influencing the formation of consumer group preferences.

An example of a subject of the Republic of Belarus with high potential for the development of territorial branding is the Vitebsk region, as it is a region with a wide range of resources - unique monuments of history, nature and culture.

Vitebsk region is one of the six regions of Belarus, located in the north-east of the country [3].

Vitebsk region is included in the Euroregion "Lake District". There are over 2800 lakes, more than 500 rivers. Forest occupies more than a third of the region's territory - about 60% of it falls on centuries-old coniferous forests.

Vitebsk is a regional administrative center. The region includes 21 districts and 2 cities of regional subordination. Vitebsk region borders on three countries and has developed road infrastructure. Several highways of international importance pass through the region.

The length of railways in the Vitebsk region exceeds 1200 km. The main railway junctions are Vitebsk, Orsha and Polotsk. International railways connecting Russia with Ukraine, Poland, Lithuania pass through the territory of the region.

Vitebsk region is a developed industrial region of Belarus. More than 23 % of the working population is employed in industrial enterprises. The main industrial centers are Vitebsk, Polotsk and Orsha. In Vitebsk there is a free economic zone "Vitebsk".

Vitebsk is the birthplace of the famous international art festival "Slavic Bazaar in Vitebsk."

An integral part of tourism is nature, as well as the attractions of the region.

The tourism sector of the Vitebsk region includes [4]:

- more than 3 thousand monuments of archeology, architecture, history, art and culture, about 1000 are listed in the list of historical and cultural values of the Republic of Belarus.
- more than 100 sanatorium-resort and health-improving organizations: 9 motels, 3 student sanatoriums, 2 health centers, 29 recreation centers and others.
- more than 600 estates hospitably welcome tourists from different countries.
- more than 300 objects, 200 natural monuments, 88 reserves, 2 national parks and the only Berezinsky Biosphere Reserve in Belarus.

In the region, work is underway to develop the tourism industry, aimed at improving the

infrastructure, service and promoting tourism products on foreign service markets. A number of tourist activities (festivals, holidays, competitions), both traditional and new, have been held. More and more foreign visitors come to participate in them every year. Vitebsk region ranks second in the ranking of regions in terms of the number of agroecotourism entities. Video films were created about cities and regions of the region, where their tourism potential is also reflected [4].

The results of tourism in the Vitebsk region can be seen in the following table [5]

Table 1 – Analysis of Tourism in the Vitebsk region at the end of 2018

Carried out tourism activities	157 organizations
whose services were used by	197.9 thousand organized tourists and excursionists
the number of organized tourists and excursionists who visited the Republic of Belarus and served by tourist organizations of the Vitebsk region is	37.6 thousand people
provided services of	105 hotels and similar accommodation facilities
functioned in the region in 2018	109 sanatorium-resort and health-improving organizations
carried out activities of	480 subjects of agroecotourism

Source: developed by the author

Recently, in Belarus, the issue of branding of entire cities and regions has become relevant. Experience shows that regions in which management understands the importance of branding and the principles of its construction receive great interest from partners and investors, provided that the brand has an objective, positive color. Every aspect of the city's life - from the cleanliness of the streets to the work of enterprises and the mood of their employees - affects the formation of the city's brand, even if we don't.

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A CROSS- CULTURAL APPROACH TO THE VOCATIONAL TESTING

МЕЖКУЛЬТУРНЫЙ ПОДХОД К ПРОФЕССИОНАЛЬНОМУ ТЕСТИРОВАНИЮ

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ABSTRACT

MULTICULTURAL ENVIRONMENT,
EDUCATIONAL SYSTEM, THE VOCATIONAL
TESTING, BLENDED LEARNING, TEACHING
TECHNIQUES, THE MULTIPLE-CHOICE TESTS

The article deals with a role of blended learning as a main method of teaching, and computer-based tests as an integral component of an EFL course for non-linguistic students who need to communicate effectively in English. Along with other methods, special attention must be paid to computer-based tests, which are becoming more and more common in foreign language skills assessment. WE defined that the most difficult tasks were writing essays and progress tests.

АННОТАЦИЯ

ОТНОСЯЩАЯСЯ К РАЗНЫМ КУЛЬТУРАМ
СРЕДА, ОБРАЗОВАТЕЛЬНАЯ СИСТЕМА, ПРО-
ФЕССИОНАЛЬНОЕ ТЕСТИРОВАНИЕ, СМЕ-
ШАННОЕ ОБУЧЕНИЕ, ОБУЧАЮЩИЕ МЕТО-
ДЫ, ТЕСТЫ НА МНОЖЕСТВЕННЫЙ ВЫБОР

В статье рассматривается роль смешанного обучения как основного метода обучения, и компьютерных тестов, как неотъемлемого компонента курса EFL для студентов неязыковых вузов, которым необходимо эффективно общаться на английском языке. Мы определили, что самыми сложными задачами являются написание эссе, и тестов для оценки успеха.

Contemporary educational process is a subject to constant evolution, whose driving force is the process of technological development. The institution of higher education is also perceived differently, namely as a place of acquiring knowledge virtually rather than in a traditional way.

Today's graduates of technical university will have to work in multicultural environment. One should be aware that the duality and differences in the interpretation of certain phenomena by students of different cultures is inevitability inherent in the structure of the modern world.

There are at least two approaches for defining the role of education in the society. According

to the first one education is an instrument for fixation, reproduction and compiling of the existing system of relationships in the society. In this case education plays a subordinate role and follows the society development. It is just the condition of the society that defines the content of education and possibilities for future change.

The second approach is based on the idea that education is not only the factor of knowledge reproduction but it is motive power of society development. It is a unique tool that allows reconsidering the existing system of relations in the society and transition to a new stage of development. This means completely different content of educational system and its organization. In our opinion the second approach should underlie in Belarusian education reforms.

The higher education institutions recognize the necessity of critically examining the current practices and the potential of information and communication technologies. The challenge now is to gain a deep understanding of the need, potential and strategies of such technology as blended learning to approach the ideals of higher education. It is obvious that only continuing the formation of new educational paradigm Belarusian higher education will get a chance to acquire leading positions in the world.

We defined blended learning as a method of teaching that combines the most effective face-to-face teaching techniques and online interactive collaboration, both constituting a system that functions in constant correlation and forms a single whole. The system will work effectively only if its components are balanced and methodically adequate to program educational objectives. Blending of face-to-face and online learning environments should be planned precisely in order to benefit more from this approach.

Blended learning makes it possible to vary the pace of new material study and self-work. A great variety of tasks in the online component of the blended course contributes both to elimination of knowledge gaps and profound material study. For example, for the same text in foreign language students can be offered tasks of different difficulty level. Weak students have an opportunity to practice first some simple tasks, while strong students can immediately go to the tasks of high complexity. It is important that students have the possibility of choice which is substantially the basis of any creativity. This approach develops students' adequate self-esteem; they should define an appropriate level of difficulty and make the right choice. Situations of choice encourage students' inner motivation and responsibility for their academic success. Moreover people learn better when they have more than one media to use.

The simple fact that there are two or three different types of training: reading a book, trying out a skill on an exercise, listening to a lecture, and interacting with a web-based course has a significant impact on mastery and retention.

According to our researches there are two independent systems of foreign language performance that can be used to learn a foreign language: acquisition and learning. These two systems are different but related.

Acquisition is the natural, subconscious process that involves constant exposure to the language. Ideally, the learner is surrounded by native speakers and is required to use a language in order to communicate.

On the contrary, learning is the formal conscious process by which the learner is taught rules of the language, for example knowledge of grammar rules.

Along with other methods, special attention must be paid to computer-based tests, which are becoming more and more common in foreign language skills assessment. The first test battery was designed for the learners of the intermediate level of communicative competence. It should be noted that grammar was not a random choice. Therefore, it is difficult for students to speak English well without learning English grammar.

The tests are aimed at practicing the usage of English verb tenses in different aspects of the English grammar. These are the tests of the multiple-choice format based on the vocabulary familiar to the students. The multiple-choice format is a commonly used type of tests and it was used for our tests.

We have chosen the Quiz module of the Virtual Learning Environment Moodle - Modular Object-Oriented Dynamic Learning Environment to deploy the tests. Moodle is provided freely in Belarusian universities as Open Source software.

The learning process is based on traditional teaching of a discipline and on-line learning, using the e-course developed in LMS Moodle for monitoring the students' self-study. At the beginning students get teacher's on-line instructions in the classroom saving time for the quiz and the results discussed.

The results of the survey held for the second year students showed that the majority of students 90 % prefer blended learning and only 4 % want to have traditional form of learning and nobody wanted to learn foreign languages only online. Students mentioned the participation in webinars and online discussions as the most amusing tasks.

It turned out that the most difficult tasks were writing essays and progress tests. Students told about the factors that complicated the study of the course, they marked out: unstable Internet connection, large quantity of people taking part in discussions, lack of time for online tasks. But still most of students mentioned that it was convenient to have 24 hour access to the course materials. The survey showed that students support integration of blended learning in the process of teaching foreign languages.

However, the teachers understand the possibilities of blended learning, when online learning combines with traditional teaching as a perspective of education. These facts demonstrate the proper priorities in new educational methods, development and implement of e-learning for teaching languages.

Blended learning is a form of learning that combines traditional full-time form of teaching with modern forms of e-learning, increasing the advantages and offsetting the disadvantages of each. The modular organization of teaching provides the flexibility of the program. Students

choose a module by interest, but irrelevant, well known already information they may pass, according to individual learning strategy.

Nevertheless, it should be mentioned that along with apparent advantages, implementation of computer-based testing also increases the teacher's working load, who has to spend more time to compile enough quantity of relevant to the learning objectives grammar tests, and this is an incredibly time-consuming and tedious process.

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EQUILIBRIUM OF FOREIGN TRADE OF TEXTILE PRODUCTS AND CLOTHES IN THE EUROPEAN UNION COUNTRIES

СБАЛАНСИРОВАННОСТЬ ВНЕШНЕЙ ТОРГОВЛИ ПРЕДПРИЯТИЙ ТЕКСТИЛЬНОГО ПРОИЗВОДСТВА И ОДЕЖДЫ В СТРАНАХ ЕВРОСОЮЗА

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ABSTRACT

*BALANCE, EXPORT, FOREIGN TRADE
BALANCE, IMPORT, TEXTILES, CLOTHES*

The article presents the results of assessing the equilibrium of foreign trade of textile and clothing enterprises in the EU countries. Key absolute and relative indicators characterizing the state and level of development of foreign trade are highlighted, as well as its main findings.

АННОТАЦИЯ

*СБАЛАНСИРОВАННОСТЬ, ЭКСПОРТ,
САЛДО ВНЕШНЕЙ ТОРГОВЛИ, ИМПОРТ,
ТЕКСТИЛЬ, ОДЕЖДА*

В статье представлены результаты оценки сбалансированности внешней торговли предприятий текстильного производства и одежды в странах ЕС. Выделены ключевые абсолютные и относительные показатели, характеризующие состояние и уровень развития внешней торговли, а также приведены ее основные выводы.

Today, in the context of growing competition in the world, foreign economic activity is the most important indicator of the involvement of several countries in the global division of labor, the value chain, which requires intensifying factors of intensive growth based on the initiative and enterprise of the business, innovativeness of basic industries and new industries.

In the scientific literature there are many concepts of balanced development, however, in our opinion, the balanced development of an enterprise is an increase in the added value it creates while maintaining break-even and faster growth of exports over imports, which ensures the contribution of the enterprise to economic growth without creating trade and budget imbalances [1-2].

In market conditions, an enterprise, being an economically independent producer of goods, uses different approaches to assessing the effectiveness of foreign economic activity (FEA) (one of the conditions for balanced development), which allows revealing the real situation of balancing the volume of exports, imports, and foreign trade balances. The methodological approaches of domestic and foreign researchers to measuring and evaluating the balance and effectiveness of foreign economic activity of an enterprise [1] are distinguished by a list of indicators, their position in the proposed systems, and the methodology for calculating individual indicators that make it possible to generally assess the impact of various factors.

Assessment of the state and level of balance of exports over imports (or the balance of foreign economic activity) of enterprises was carried out on the basis of indicators of the 1st and 2nd group, their calculation methods and characteristics are presented in [1]. In assessing the equilibrium of foreign trade activities of clothing enterprises, absolute indicators were used: export (E), import (I), foreign trade balance (Balance), foreign trade turnover (TO), as well as relative indicators: foreign trade balance ratio (or net trade index) (KSVD), import export coverage ratio (KPI), the country's share of goods turnover in the total volume of goods turnover (TO share), i-partner's contribution efficiency (EXVD), etc.

The foreign trade results of clothing manufacturing enterprises (C14 – "Manufacture of wearing apparel") are presented on the example of the most significant 10 out of 28 countries of the European Union (EU) and textile enterprises (C13 – "Textile production"). The criteria for the selection of European countries were the following: the number of enterprises and the volume of clothing production. The information base was built on Eurostat statistics, including economic indicators of business for 2016 [3].

Foreign trade volumes of selected European countries (Table 1) were mostly affected by export of products. The largest European clothing exporting country in 2016 was Italy (IT), and also included Germany (DE), Portugal (PT), Romania (RO) and France (FR). The balance of foreign trade of these products in the EU-10 in 2016 had a positive value – 10,086.2 million euros. In the structure of foreign trade in clothing, exports significantly exceeded imports. The share of exports of these products accounted for 61.3 % of the total turnover of EU-10 countries, imports – 38.7 %. The main share of foreign trade in clothing from the EU countries falls on Italy – 33.1 % and Germany – 13.9 %.

An assessment of the level of balance in the foreign trade activity of clothing manufacturing enterprises can be presented using the following relative indicators: K (PEI), as well as K (SVD) and others [1] (Table 1).

In seven EU-10 countries in 2016, K (PEI) exceeded 100 %. High positive coverage by import exports was observed in Portugal – 426 % and Italy – 238 %, the smallest in Spain – 74.6 %. The calculation of K(SVD) indicates that the trade in clothing in a number of EU-10 countries was balanced. We see from Table 1 that the largest value of the net trade index is observed in Portugal – 0.620; Italy – 0.409 and Poland – 0.371. Exports of clothing in the countries listed

above increased at a faster pace relative to imports. The effectiveness of the contribution of individual EU countries (partners) to the overall equilibrium of foreign trade in clothing was the following: Italy – 13.5 %; Portugal – 3.8 % and Romania – 1.8 %. The result of EC (SVD) for Portugal was due to the high value of $K(SVD)$, and in Italy and Romania it is due to their share of turnover.

Table 1 – Absolute and relative indicators of the equilibrium of foreign trade of clothing manufacturing enterprises in the EU countries for 2016

Country (Two-letter Code)	Absolute indicators, million euros				Relative indicators			
	Export	Import	Balance	TO	$K_{(СВД)}$	Share TO, %	$\Delta K_{СВД}$ %	$K_{(ПЭИ)}$
1. Italy (IT)	12 023,2	5 043,7	6 979,4	17 066,9	0,409	33,13	13,548	2,384
2. Germany (DE)	3 407,1	3 737,3	-330,2	7 144,4	-0,046	13,87	-0,641	0,912
3. Portugal (PT)	2 549,2	598,7	1 950,5	3 148,0	0,620	6,11	3,786	4,258
4. Romania (RO)	2 450,0	1 543,3	906,7	3 993,3	0,227	7,75	1,760	1,587
5. France (FR)	1 951,1	2 324,8	-373,7	4 276,0	-0,087	8,30	-0,725	0,839
6. Spain (ES)	1 287,6	1 725,0	-437,4	3 012,5	-0,145	5,85	-0,849	0,746
7. Bulgaria (BG)	1 284,9	791,4	493,5	2 076,2	0,238	4,03	0,958	1,624
8. Belgium (BE)	1 024,8	681,2	343,7	1 706,0	0,201	3,31	0,667	1,505
9. Poland (PL)	801,6	367,7	433,9	1 169,4	0,371	2,27	0,842	2,180
10. Austria (AT)	606,2	486,5	119,7	1 092,7	0,110	2,12	0,232	1,246
Total EU-10	27 385,8	17 299,6	10 086,2	44 685,4	0,226	86,74	19,578	1,583
Total EU-18	3 575,0	3 256,8	318,2	6 831,8	0,046	13,26	0,610	1,098
Total for EU-28	30 960,8	20 556,4	10 404,4	51 517,2	0,202	100	20,2	1,506

Source: made by author based on [1-3]

The volume of foreign trade of the selected countries (Table 2) was mostly affected by export of products. The largest EU textile exporting country in 2016 was Italy, and also included Germany, Belgium, France and Spain. The equilibrium of foreign trade of these products in the EU-10 countries in 2016 had a positive value – 11,753.7 million euros. In the structure of foreign trade in textile products, exports significantly exceed imports. In 2016, the share of

exports of these products accounted for 62.1 % of the total turnover of the EU-10 countries, imports – 37.9 %. The main share of foreign trade in textile products from the EU countries falls on Italy – 20.2 % and Germany – 17.2 %. In all EU-10 countries, in 2016 KPII exceeded 100 %. The maximum positive coverage by imports to exports was observed in Belgium – 200 % and Portugal – 199 %, the smallest in Great Britain – 109.4 % (Table 2).

Table 2 – Absolute and relative indicators of the equilibrium of foreign trade of textile enterprises in the EU countries for 2016

Country (Two-letter Code)	Absolute indicators, million euros				Relative indicators			
	Export	Import	Balance	TO	$K_{(CBД)}$	Share TO, %	EKSVD, %	$K_{(PEI)}$
1. Italy (IT)	7,904.5	4,142.8	3,761.7	12,047.4	0.312	20.24	6.319	1.908
2. Germany (DE)	6,313.7	3,904.6	2,409.1	10,218.3	0.236	17.17	4.047	1.617
3. Belgium (BE)	2,944.3	1,471.9	1,472.4	4,416.2	0.333	7.42	2.474	2.000
4. France (FR)	2,888.1	2,013.6	874.4	4,901.7	0.178	8.23	1.469	1.434
5. Spain (ES)	2,102.9	1,365.7	737.2	3,468.5	0.213	5.83	1.238	1.540
6. Portugal (PT)	1,762.5	886.4	876.1	2,648.9	0.331	4.45	1.472	1.988
7. Poland (PL)	1,761.7	1,277.8	483.9	3,039.5	0.159	5.11	0.813	1.379
8. Netherlands (NL)	1,623.7	920.5	703.1	2,544.2	0.276	4.27	1.181	1.764
9. United Kingdom (GB)	1,574.9	1,440.1	134.8	3,014.9	0.045	5.06	0.226	1.094
10. Czech Republic (CZ)	1,307.6	1,006.8	300.8	2,314.4	0.130	3.89	0.505	1.299
Total EU-10	30,183.9	18,430.2	11,753.7	48,614.1	0.242	81.66	19.745	1.638
Total EU-18	6,487.8	4,426.9	2,060.9	10,914.7	0.189	18.34	3.467	1.466
Total for EU-28	36,671.7	22,857.1	13,814.6	59,528.8	0.232	100	23.212	1.604

Source: made by author based on [1-3]

The calculation of the RACF indicates that, in general, the trade in textile products in the EU-10 countries was balanced. At the same time, we see that the largest value of the net trade index is observed in Belgium – 0.333; Portugal – 0.331 and Italy – 0.312. Exports of textile products from the above countries increased at a faster pace than imports. The overall equilibrium of foreign economic activity in the EU countries was provided by Italy – 6.3 %;

Germany – 4.1 %; Belgium – 2.5 % and Portugal – 1.47 %. The result of the EKSVD in the first and second countries was due to the high value of the RDC and their share in the turnover and in the third and sixth countries due to the RDC compared to France and Spain, the net trade index is a determining factor characterizing the effectiveness of the contribution of each partner.

Based on the results of assessing the equilibrium of foreign trade in clothing and textile production in the EU countries, the following conclusions can be drawn.

First, in 2016, the export of products had the greatest impact on foreign trade in the EU countries. The largest exporter and importer of clothing, as well as textiles in the EU, was Italy.

Secondly, it is advisable to formulate a conclusion on the equilibrium of foreign trade not only by the results of K(PEI) and K(SVD), but in conjunction with the geographic concentration of export of products, since the above indicator allows to identify key consumer countries and determine the level of export diversification products.

Thirdly, it is a mistake to assert that the positive results of the equilibrium of foreign trade in absolute and relative indicators indicating the effectiveness of foreign trade of enterprises, as it may cause them losses. Foreign trade of enterprises will be effective if the result from the main activity will be profitable. This confirms the conclusion that the equilibrium of foreign exchange earnings and payments does not yet mean the effectiveness of trade.

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UDC 338.5

ANTI-INFLATIONARY REGULATION BY MONETARY METHODS IN THE REPUBLIC OF BELARUS

АНТИИНФЛЯЦИОННОЕ РЕГУЛИРОВАНИЕ МОНЕТАРНЫМИ МЕТОДАМИ В РЕСПУБЛИКЕ БЕЛАРУСЬ

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ABSTRACT

ANTI-INFLATIONARY POLICY, INFLATION,
MONETARY POLICY, INFLATION TARGETING,
ECONOMIC STABILIZATION

The dynamics of inflation and its main factors in various time periods of development of the national economy of the Republic of Belarus are considered. The measures taken by the National Bank to ensure price stability and their effectiveness are analyzed. In the chronology, the features of the applied monetary policy regimes, the change in targets and regulatory tools are considered. The features of anti-inflationary regulation by monetary methods in current conditions of the Republic of Belarus are described.

АННОТАЦИЯ

АНТИИНФЛЯЦИОННАЯ ПОЛИТИКА, ИНФЛЯЦИЯ, МОНЕТАРНАЯ ПОЛИТИКА, ТАРГЕТИРОВАНИЕ ИНФЛЯЦИИ, ЭКОНОМИЧЕСКАЯ СТАБИЛИЗАЦИЯ

Рассмотрена динамика инфляции и ее основные факторы в различные временные периоды развития национальной экономики Республики Беларусь. Проанализированы принимаемые меры Национального Банка по обеспечению ценовой стабильности и их эффективность. В хронологии рассмотрены особенности применявшихся режимов денежно-кредитной политики, характер изменения целевых ориентиров и инструментов регулирования. Изложены особенности антиинфляционного регулирования монетарными методами в современных условиях Республики Беларусь.

The task of achieving a stable low inflation rate is relevant for many states, including the Republic of Belarus. Effective implementation of anti-inflationary policy requires a comprehensive analysis of the determinants of inflation, as well as its forecasting. Inflation

in Belarus until the mid-2000s was clearly monetary in nature. This is evidenced by the close relationship between the growth rate of the money supply and inflation. The influence of monetary factors to a lesser extent persisted in subsequent years. In this regard, the role of monetary policy is relevant in anti-inflationary regulation.

The monetary policy of the Republic of Belarus is a part of economic policy. Its implementation is provided by the National Bank in conjunction with the Government of the Republic of Belarus. Since the sovereignty there has been a constant adjustment of the priorities and ultimate goals of the monetary policy, based on the current macroeconomic situation and problems to be solved. The main direction was to ensure the stability of the Belarusian ruble and achieve price stability, as a condition for balanced development of the open economy of the country. Lack of experience in monetary regulation during the period of economic transformation, negative trade balance, dollarization and other problems of the 1990s not allowed to achieve high efficiency monetary policy. In some years, the consumer price index reached more than one thousand percent.

Measures taken by the National Bank in 2000 to terminate targeted equity lending to the economy, limit the growth of the ruble money supply, reach positive real interest rates and eliminate the problem of multiple exchange rates became the foundation for effective containment of inflation. Adhering to the system of monetary guidelines, consisting of a target parameter (nominal anchor) and indicative variables, the National Bank monitored the inflation rate annually. Since 2003, the exchange rate has been used as the nominal anchor. Currency targeting together with fiscal measures and the regulation of prices and wages generally had positive results. If in 2003 the inflation rate reached 25 %, then in 2008 it did not exceed 14 %. Since 2009, the exchange rate gradually began to be less fixed, was tied to a basket of foreign currencies (Euro, US dollar, Russian ruble), and since 2012, after the currency crisis, it got minimal regulation from the National Bank. This crisis, as a result of the high negative current account balance of the balance of payments, together with a softening of the fiscal and monetary policy, price liberalization and other reasons, led to an inflation rate of 108.7 % in 2011. In 2012 price stability was determined as a priority objective of monetary policy. The National Bank started using tight monetary policy aimed at maintaining high interest rates, refinancing banks only on market conditions and increasing reserve requirements. The result was a decrease in inflation in 2012 to 21.8 %. Slowing inflation remained a priority in subsequent years. In 2013-2014 in order to ensure anti-inflation orientation of the interest rate policy and maintain a stable situation in the deposit and foreign exchange markets, the National Bank carried out a gradual reduction in the refinancing rate. On the credit and deposit market, a positive level of real interest rates was ensured with a higher profitability of deposits in national currency. In conditions of external stability the taken measures reduced inflation to 16.5 and 16.2 % in 2013 and 2014, respectively. [6, p. 207]

At the end of 2014, there was a negative abrupt change in the foreign economic

situation. Significant devaluation of the Russian ruble amid falling oil prices, repayment of foreign liabilities, and a decrease in business activity in the countries - trade partners of Belarus negatively affected the foreign trade, the volume of foreign exchange earnings and devaluation expectations. Net demand for foreign currency began increasing in the foreign exchange market. At the same time there was an outflow of ruble deposits of the population in the deposit market. In order to stabilize the situation, the National Bank, together with the Government of the Republic of Belarus, took a number of operational measures, including exchange rate adjustment, increase in interest rates, restriction on foreign currency lending to legal entities, increase in the norms for compulsory sale of foreign currency. Positive changes in the foreign exchange and deposit markets at the beginning of 2015 contributed to the gradual cancellation of the introduced measures. [3]

In order to create conditions for accelerating economic growth and increasing the effectiveness of economic policy, the Anti-inflationary Program (2015) was developed. It presented a set of monetary, fiscal, antitrust, pricing and organizational measures. The 2017 goal was to achieve an inflation value of not more than 10 %. The monetary policy measures developed in the program were aimed at limiting the growth rate of the broad money supply, maintaining positive real interest rates, and ensuring a balanced situation in the domestic foreign exchange market. [1]

Since 2015, the National Bank began to control the money supply in the monetary targeting regime and set an interim goal - control over the growth of the broad money supply. In 2016, its value was determined in the range of 16-20 %, in 2017 – 12-16 %. An increase in the ruble monetary base was an operational goal in 2015-2017. In order to stabilize the situation in the foreign exchange market, the National Bank adhered to the regime of controlled floatation of the exchange rate and conducted tenders in the form of a continuous double auction, which made it possible to establish the rate based on supply and demand with minimal its participation. [4]

An important component of monetary policy was the formation of a mechanism for managing inflation expectations based on their monitoring, ensuring transparency of the current monetary policy, and the general availability of economic information for the population. Starting in November 2017, the National Bank of Belarus began to quarterly publish materials on inflationary expectations.

The measures taken to ensure price stability made it possible to systematically achieve a slowdown in inflationary processes. Later in 2018, a new Anti-inflationary program was developed. It determined the need for the formation of monetary conditions conducive to ensuring inflation in the medium-term period of 4 % with legislative consolidation of the responsibility of the National Bank. For non-inflationary economic growth, measures were developed to increase confidence in the national currency and de-dollarize the economy, ensure information transparency of monetary policy. [2]

The implementation of monetary policy was continued in the regime of monetary targeting. The intermediate target for the growth of the broad money supply in 2018 and 2019 was 9-12 %. However, in 2018 there was a change in the operational benchmark. Instead of an increase in the ruble monetary base, the interest rate on overnight interbank loans in national currency began to be used. In the context of stabilization in the foreign exchange market in 2018, restrictions on the purchase of foreign currency were lifted and a single procedure for foreign exchange transactions for legal entities and individual entrepreneurs in the domestic foreign exchange market was established, the mandatory sale of foreign exchange earnings was canceled. [5, p.3]

The measures noted above allowed to achieve established in 2016–2018 inflation parameters and stabilize the situation in the foreign exchange market, which contributed to the formation of conditions for the transition to inflation targeting in the medium term as that was noted in the Program of Socio-Economic Development of the Republic of Belarus for 2016–2020.

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UDC 332.1

VISA-FREE REGIME AS A FACTOR OF INCREASING TOURIST FLOW OF BRASLAV DISTRICT

БЕЗВИЗОВЫЙ РЕЖИМ КАК ФАКТОР УВЕЛИЧЕНИЯ ТУРИСТИЧЕСКОГО ПОТОКА БРАСЛАВСКОГО РАЙОНА

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ABSTRACT

*TOURISM, BRASLAVSKY DISTRICT, TOURIST
FLOW, VISA-FREE REGIME*

The article discusses the relevance of the introduction of visa-free entry for foreign citizens to the territory of Braslav district in order to increase the tourist flow in the summer and in the off-season.

АННОТАЦИЯ

ТУРИЗМ, БРАСЛАВСКИЙ РАЙОН, ТУРИСТИЧЕСКИЙ ПОТОК, БЕЗВИЗОВЫЙ РЕЖИМ

В статье рассматривается актуальность введения безвизового порядка въезда иностранных граждан на территорию Браславского района с целью повышения туристического потока, как в летний период, так и в период межсезонья.

In the modern world, the geographical location of the region, the size of its territory, natural resources largely determine the material directions of economic development, social and cultural support. With the intensification of scientific and technological progress, the establishment of an open market economy in Belarus, interregional and interstate relations are expanding. These trends are typical for Braslav district.

Braslav district with its beautiful nature is known as a resort, tourist region far beyond the borders of our Republic. The region has a rich flora and fauna, mineral deposits such as peat, fusible clay, sand and gravel material. Since the district has three roads of national importance-R-3 Logoisk-Zembin-Glubokoye-the border of Latvia (Urbana), R-27 Braslav-Postavy-Myadel, R-14 Polotsk-Miory-Braslav, through the district passes a large number of heavy vehicles.

The favorable geographical location of Braslav (the city is located in the center of the Belarusian lake district) makes it a major tourist center, which annually attracts hundreds of

tourists from Belarus and abroad.

Thus, the geographical location and natural recreational resources of Braslav district made it a tourist attraction.

In the area of reception and accommodation of tourists are engaged in GPU "National Park "Braslav Lakes", unitary enterprise "Braslav Lakes", tourist complexes "Strusto", "Green Club", hotels "Braslav-Kommunalnik", "Braslav-hotel", "Zaezny Dvor", as well as numerous farmsteads.

According to the Department of Education, Sports and Tourism, the region received 14,113 tourists in 2017. Most of the tourists come from major Belarusian cities, mainly Minsk and Vitebsk. Among the foreign tourists there are citizens of Poland, Germany, Austria, Norway and other countries. Compared to 2016, the number of tourists increased by almost 2,000 people. It should be noted that the statistical data did not take into account the vacationers of farmsteads, of which there are more than 300, as well as vacationers at tourist sites [1].

However, the number of tourists and vacationers sharply decreases in the off-season, which is the reason for the decline in profits in the organizations of trade, services and agro-tourism.

To increase the tourist flow in Belarus, a number of measures are being carried out, one of which is the improvement of the legislative framework. In particular, there is a visa-free entry procedure to Belarus for citizens of a number of States for up to 30 days through the checkpoint at Minsk National airport, which is provided by decree No. 8 of January 9, 2017 (with amendments that came into force on July 24, 2018).

In 2019, President of Belarus Alexander Lukashenko signed Decree No. 300 "On establishing a visa-free entry and exit procedure for foreign citizens". The document will act instead of Decree No. 462 of 26 December 2017. According to Decree No. 300, the two visa-free zones for tourist and recreational areas of Brest and Grodno, which previously existed separately, are merged into one visa-free territory "Brest-Grodno". It includes five districts of the Grodno region: Brest, Volkovysk, the Grodno, Lida and Shchuchin. In this region, the period of visa-free stay for tourist purposes is increased to 15 days for citizens of 73 countries. In addition, it will be possible to enter through two additional checkpoints on the state border ("Benyakoni" and "Berestovitsa") [2].

The author proposes to consider the introduction of a visa-free regime for foreign tourists Braslav district for a period of stay in the tourist area up to 15 days. This event will allow the following:

- To increase tourist flow in the region;
- To solve the problem of reducing the number of tourists in the off-season;
- To increase the tourist attractiveness of the region and the country as a whole;
- To develop the infrastructure of the district.

Thus, the main argument for the introduction of a visa-free regime is the potential increase in tourist flows and, as a consequence, tourism revenues. By cancelling a visa, the state

reduces the cost of entry for tourists, thereby increasing the demand for travel. The increase in the number of tourists will be an incentive for the development of Braslav district in the sphere of sanatorium treatment, creation and promotion of various international festivals, festive events. Positioning the region as a tourist area will improve the welfare of the local population, increase the level of employment of citizens, as well as increase the gross regional product.

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INFORMATIZATION AS A FACTOR OF DEVELOPMENT OF MODERN ECONOMICS AND ENSURING COMPETITIVENESS

ИНФОРМАТИЗАЦИЯ КАК ФАКТОР РАЗВИТИЯ СОВРЕМЕННОЙ ЭКОНОМИКИ И ОБЕСПЕЧЕНИЯ КОНКУРЕНТОСПОСОБНОСТИ

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ABSTRACT

INFORMATIZATION, INFORMATION SOCIETY, INFORMATION AND COMMUNICATION TECHNOLOGIES, INFORMATION INFRASTRUCTURE, KNOWLEDGE ECONOMY

АННОТАЦИЯ

ИНФОРМАТИЗАЦИЯ, ИНФОРМАЦИОННОЕ ОБЩЕСТВО, ИНФОРМАЦИОННО-КОММУНИКАЦИОННЫЕ ТЕХНОЛОГИИ, ИНФОРМАЦИОННАЯ ИНФРАСТРУКТУРА, ЭКОНОМИКА ЗНАНИЙ

Today it is customary to talk about the formation of a new type of economy - an economy based on information. M. Castells in his writings calls such an economy informational and global. It is informational since the productivity and competitiveness of factors or agents in this economy depend, first of all, on their ability to generate, process and efficiently use knowledge-based information. It is global because the main types of economic activity are organized on a global scale, directly or using an extensive network connecting economic agents. In Belarus, the development of informatization is a prerequisite for maintaining competitiveness.

Сегодня принято говорить о формировании нового типа экономики – экономики, основанной на информации. М. Кастельс в своих трудах называет такую экономику информационной и глобальной. Информационной – так как производительность и конкурентоспособность факторов или агентов в этой экономике зависят, в первую очередь, от их способности генерировать, обрабатывать и эффективно использовать информацию, основанную на знаниях. Глобальная – потому что основные виды экономической деятельности организуются в глобальном масштабе, непосредственно или с использованием разветвленной сети, связывающей экономических агентов. В Республике Бела-

руссь развитие информатизации является необходимым условием сохранения конкурентоспособности.

Evaluation of information as a new factor of production and resource began in the mid-1950s, and from the second half of the 1970s many scientists have started talking about the formation of an "informational" society. Just as at one time capital replaced land as a resource that attracted the greatest demand with limited supply, today knowledge, being a rare production factor, replaces capital. Moreover, the limited and rarity of knowledge is the limited and rarity of a completely different order than all previously known resources. Labor was also influenced by the widespread and widespread use of information, the development of means of processing it. This is reflected in a decrease in employment in industry and the primary sector, which was offset by an increase in employment in the services sector. A situation arises when a person increasingly appears today not as a subject of labor activity, but as a carrier of unique capabilities and abilities.

Under these conditions, as never before, non-traditional forms of production that do not require the concentration of significant capital become the most advanced and achieve the greatest success. Fifteen of the twenty richest people in the United States are companies that have emerged over the past two decades (Microsoft, Metromedia, Intel, Oracle, Viacom, New World Communications, etc.) [1]. In a broad sense, informatization can be defined as the process of using information and communication technologies (ICT) and systems in all areas of social, economic, political and cultural life of society with the goal of the most efficient use of information and knowledge in the direction of civilization's movement towards the information society. This definition focuses specifically on the use of information for the transition to the information society [2].

An analysis of the development of the ICT sector in Belarus shows that the scientific, technical, industrial and intellectual capabilities available in our country are sufficient to form an innovative economic system. In general, the picture of informatization in Belarus is as follows. The basic complex of electronic government has been practically created, which includes such components as a nationwide automated information system, an interdepartmental electronic document management system, a state system for managing public keys for verifying electronic digital signatures, a single settlement information space, and others.

According to the estimates of the Commission of the International Telecommunication Union (ITU) on the development of broadband access, the Republic of Belarus currently occupies the 25th position in the number of fixed broadband subscribers (28.8 per 100 people) and the 23rd position in the number of households with Internet access (57.1 per 100 households) among 195 countries receiving the survey.

Belarus rose to 38th place in the UN ranking on the level of development of e-government

(United Nations E-Government Survey 2018). The country moved 11 lines up compared to 2016 results [3, 4].

The ranking includes 193 countries. For the first time in its history, Belarus has moved to a group of countries (top 40) with a very high index of e-government development (Very-High-EGDI). According to the rating compilers, this may be due to the implementation of the national sustainable development strategy for the period until 2030, which includes several initiatives related to the development of ICT in various sectors of the economy [5].

All 40 countries except two from the very high EGDI group are high-income countries; Belarus and Kazakhstan are above average income countries. As previous UN studies (in 2012, 2014 and 2016) show, per capita income, reflecting the country's economic potential, has a strong influence on the development of national e-government. The composite index (E-Government Development Index) of Belarus in the ranking was 0.7641. The most highly rated human capital index of Belarus is 0.8681. The level of development of online services is 0.7361, the index of ICT infrastructure is 0.6881. Belarus has also made significant progress in the ranking of countries by the E-Participation Index - from 76th to 33rd place. This indicator reflects the development of active communication services between citizens and the state [3].

The Information and Communication Technology (ICT) Development Index 2017 was published as part of the annual report of the International Telecommunication Union (ITU) "Measuring the information society". Country profiles were compiled for 176 countries. In 2017, Belarus took 32nd place in the ITU Information and Communication Technology Development Index with an index of 7.55 points. Compared to the previous year, the position of Belarus has not changed, but the value of the index improved by 3.57 %. This allows us to say that our country is purposefully moving towards the goal set for it by the National Strategy for Sustainable Social and Economic Development of the Republic of Belarus for the period until 2030 – to enter the top 30 countries in terms of ICT development in the ITU ICT Development Index [6].

At the same time, according to the National Statistics Committee, the coefficient of inventive activity in the country is declining: in 2015 – 1.8, and in 2017 – 1.6. The share of innovative goods and services new to the domestic market of Belarus in 2017 amounted to 44.6 %. At the same time, the share of an innovative product, new to the world market, of domestic industrial enterprises in the same year was 0.6 %, the contribution of exports of medium- and high-tech products to the trade balance was 2.2 %, and the indicator of the export of high-tech services was 25.73 %. It seems that one of the reasons for the decline in innovation activity is insufficient R&D funding – in 2017 it was estimated at 0.69 % of GDP [7].

In accordance with the Belarus 2020 Concept for the Development of Science and Economics, in order to develop fundamentally new sectors of the economy for the republic, by 2020 it is necessary to increase the share of innovative products to 22–23 %, the level of domestic R&D expenditures, mainly from extrabudgetary funds, to 2.5–2.9 % of GDP [8]. But

only raising funding does not solve the problem of stimulating the creative activity of the scientific and industrial sphere. The current innovative passivity of Belarus is not so much scientific and technical as organizational and economic in nature and does not indicate the intellectual weakness of domestic specialists, but the lack of a mechanism for converting ideas and innovative solutions into market products.

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**POLYMORPHISM OF MODERN NEEDS OF MARKET SUBJECTS
IN THE SYSTEM OF MARKETING ACTIVITY****ПОЛИМОРФИЗМ СОВРЕМЕННЫХ ПОТРЕБНОСТЕЙ СУБЪЕКТОВ
РЫНКА В СИСТЕМЕ МАРКЕТИНГОВОЙ ДЕЯТЕЛЬНОСТИ*****Golovchanskaya E.***

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ABSTRACT***NEEDS,
TRANSFORMATION,
POLYMORPHISM******INSTITUTIONAL
MARKETING,*****АННОТАЦИЯ*****ПОТРЕБНОСТИ, ИНСТИТУЦИОНАЛЬНАЯ
ТРАНСФОРМАЦИЯ, МАРКЕТИНГ, ПОЛИ-
МОРФИЗМ***

Changes of needs as institutional transformation are considered. The author emphasizes the diverse nature of modern needs, which is characterized by the author as polyformism.

Рассматриваются изменения потребностей как институциональная трансформация. Подчеркивается многообразный характер современных потребностей, который характеризуется автором как полиморфизм.

Modern institutional conditions, determined by digitalization, intellectualization, innovation development of the national economy, are characterized by the transformation of the needs of market participants and the diversity of their manifestations, which is especially important in the system of marketing activities. After all, the successful activity of any organization (enterprise) is directly related to the choice of marketing tools used to meet the needs and requirements of people and their effectiveness.

The transformation of needs is institutional in nature and reflects the influence of basic and complementary institutions, their formal and informal specificity on the changes and manifestations of needs, as well as the very nature of the consumer, which determines the nature of their needs. That is, at present there is an institutional transformation of the modern needs of market players. According to Petrenko E. S. the nature of the consumer is defined as a system of norms and rules of behavior of the consumer having consistent character [1]. The variety of manifestations of institutional transformation, expressed in their features,

characteristics, content, we characterize as polymorphism. Polymorphism is defined as "the presence, manifestation or capacity for various kinds of modifications" [2].

Polymorphism is expressed in increasing the need of market participants for information. Kaskenov P. p. notes that "taking into account cybernatization and socialization, the need for information turns into a need, if not natural, then, in any case, objective" [3]. The need for communication, i.e., networking, is increasing. Within a group of people (market subjects), united by any signs, a free exchange of opinions, information about the purchased goods is established, which facilitates the choice of goods by other participants [4] and contributes to meeting the needs for socialization. Another feature of modernity is the individual nature of consumption, due to the necessity to meet the needs of individualization. Individual approach is especially important when promoting innovation, as it accelerates the process of product selection and can significantly reduce the transaction costs of the consumer, forming satisfaction from the process of purchasing goods.

At the modern consumer the importance of an emotional component increases that defines importance of satisfaction of emotional requirements or requirements in impressions. Cherneva R. I. notes the high role of the emotional component. "Emotions always depend on needs, the scientist admits, transform needs into specific goals and ways to meet them and motivate a person to meet them" [5].

A key feature of the institutional transformation of needs is the need for intellectualization, which is based on the desire of the individual for development. There is a trend of exponential growth of needs for new knowledge [6]. The development of intellectual needs is associated with the entire sphere of research and innovation [7].

Thus, we can conclude that the institutional transformation of needs is characterized by polymorphism, which is determined by the information, network, individual, emotional, intellectual format of its manifestation. Allocation of polymorphic character of institutional transformation of modern requirements allows developing the most effective marketing mechanisms of influence on economic and social processes of subjects of the market for the purpose of the greatest satisfaction of final and intermediate consumers.

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THE USE OF BIG DATA IN THE GRADUATE'S EMPLOYMENT ANALYTICS

ИСПОЛЬЗОВАНИЕ BIG DATA В АНАЛИТИКЕ ЗАНЯТОСТИ ВЫПУСКНИКОВ

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ABSTRACT

LABOR MARKET, GRADUATE EMPLOYMENT,
BIG DATA

The problems encountered by young professionals in employment are discussed. An analysis method has been identified to improve the employment analytics through the use of Big Data.

АННОТАЦИЯ

РЫНОК ТРУДА, ТРУДОУСТРОЙСТВО ВЫ-
ПУСКНИКА, BIG DATA

В статье рассмотрены проблемы, возникающие у молодых специалистов при трудоустройстве. Для улучшения анализа занятости был определен метод с использованием Big Data.

Young professionals are the future of the professional workforce. They are more likely to work in fast-growing firms and master modern professions. More than previous generations, they are looking for more stable jobs and careers. Today's young adults are different. However, this characteristic of young adults poses challenges for organizations that need to attract and retain new talent. Young adults rate interesting work, good benefits, job security, and chances for promotion as the most important characteristics of job in a job search. These characteristics were generally rated more important than a high income. Young people can be disadvantaged in looking for work because employers often prefer older, more experienced employees who can "hit the ground running" and be productive immediately. [4] This applies particularly in times of high general unemployment, when employers can have the pick of unemployed people—some of whom have much more experience than others [2]. We heard evidence of how the State could help to create more opportunities for young people and connect them with opportunities that are already available, as well as how young people and employers can be supported in the recruitment process.

Organizations are challenged to identify what their young adults want and how to manage these needs within the larger context of managing all of its human resources. While young professionals are a diverse and educated group, many educated young people cannot break

their way into the professional workforce. Today, young educated workers work in jobs that do not advise their educational level or are completely unemployed. However, the conducted rapid polls reveal the need for a more correct and large-scale study to identify the necessary competencies and skills, and to ensure the possibility of their forecasting (using Big Data).

In the past few decades, significant forces and factors have dramatically changed the nature and characteristics of the labour market in both advanced and developing countries. On the one side, technical progress, globalisation and the reorganization of the production process – with outsourcing and offshoring: «have radically altered the demand for certain skills: several jobs are disappearing while new jobs are emerging». [1,p.6]

Recently, some of these new data sources have enabled social scientists to study new aspects of labor market activity that have historically been difficult to analyze. Although some aspects of the "wiring" of the labor market have been considered in detail in the context of falling costs of communication, the capture of massive volumes of fine-grained data on labor activity and its analysis have many new implications, especially for research into labor-based phenomena. [3]

In the modern world there is a diverse set of tools for data processing.

Big Data allows to combine and exploit a wealth of information from different sources; but data ownership remains an issue. Currently, private users have advantage in making use of this data for HR and business planning strategies; generate significant revenues. Some of these efforts have created benefits for both employees and companies, others have shifted risks to more vulnerable groups. Potential benefits in policy making and implementation remain underexploited. Policy makers need to monitor Big Data HR-strategies to avoid undercutting of labour standards.

In recent years, the amount of labour market information (LMI) conveyed through specialised internet portals and services has grown exponentially, encouraging and supporting the realisation of many internet services and tools related to the labour market, such as job matching services, advertising of job positions, services for sharing curricula. [1, p.6]

One approach that enables management of Big Data for LMI is the KDD process. The KDD process consists of five main steps, selection, pre-processing, transformation, data mining and machine learning, interpretation/evaluation. Clearly, it needs to be adapted to the domain of interest, enhancing one task or step with respect to another. [1, p.15]

Based on huge amounts of data, organizations can make accurate "portraits" of their potential customers, open new target audiences and, in general, conduct in-depth analysis of their business and make more informed decisions.

An important difference between Big Data methods is the ability to answer the questions "why this is exactly the case", "what should be done to achieve the desired result".

In Belarus, Big Data analytics can also be used. At the same time, it is necessary to identify a set of tools that will be used specifically for graduate employment analytics. The identified

tools and the analysis will eliminate the existing problems in the labor market and give a forecast in the necessary personnel.

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THE PURPOSES OF TESTS IN EDUCATION

ЦЕЛИ ТЕСТОВ В ОБУЧЕНИИ

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ABSTRACT

TEST, KNOWLEDGE, SUBJECT, ESTABLISH, DETERMINE, THINK, CREATE

This article deals with the purposes of tests in the process of education. Tests are used to find and correct weakness in the knowledge of students. This article shows the importance of tests in teaching and the advantages of using tests, the reasons of using tests. Tests are used to determine whether students have learned what they were expected to learn.

АННОТАЦИЯ

ТЕСТ, ЗНАНИЯ, ПРЕДМЕТ, УСТАНОВЛИВАТЬ, ОПРЕДЕЛЯТЬ, ДУМАТЬ, СОЗДАВАТЬ

Эта статья определяет цели тестов в процессе образования. Тесты используются для нахождения исправления недостатков в знаниях студентов. Эта статья показывает важность тестов в преподавании и преимущества использования тестов, причины использования тестов. Тесты используются для определения знаний того материала, который выучили студенты.

The purpose of test in education is not to assign marks or grades to students. Tests actually teach; they are excellent instructional devices. Test results are an indication of the knowledge students have about a particular subject at a given time. Why do we test students, you can find this answer in this article.

Use tests to correct weaknesses. Tests are used to find and correct weaknesses in learning on the part of the students, and weaknesses in teaching on the part of the instructor. Tests can show how much of a given subject is known, and point out what needs to be given more attention.

Students should be told if they are failing before they actually fail, so that they can study harder and make the grade.

Use tests to provide incentive. Tests provide students with the urge to study. They know that they will be asked questions, but they do not know what the questions will be. Therefore they study all of the material so that they will be prepared for any eventuality. In studying for

an examination they review past work in classes and organize the material. Thus they learn more because they know they will be tested.

What Are The Importance And Purpose of Test In Education And Teaching.

Provide means for comparing by testing.

Through the use of tests, instructors can compare the quality and quantity of the subject matter learned by any individual or class. Through these comparisons they can establish standards. A standard is that which is set up and established as a rule for the measurement of quantity, weight, extent, value, or quality. The measurement of an individual's work is thus expressed in terms of comparison. When we know the planned end result of a course of study, we know the objectives of that course. We find what the journeyman of that field is expected to do, and what he is expected to know. Then, by comparison with this journeyman standard, we can judge the work and learning of the student who aspires to become as efficient as the journeyman. This learning is then expressed in terms of what the journeyman needs to know, what he has to do, and the time it takes him to do it.

Use pretests to determine what is known before course is taken.

A pretest can be given to individuals and groups to determine what they know and what they can do in a subject before any teaching is done. Through the use of pretests and individualized instruction, a student can be taken from where he is found to the point where the objectives of the course indicates he should be. This is the most efficient and most economical way of teaching. No time needs to be spent in teaching things that the student already knows. It saves time and effort of both the learner and the teacher.

The pretest determines what he already knows; he is then taught what he needs; a mastery test then shows whether or not he has learned what he needs.

Essay tests. Essay tests are not recommended because they are not objective. Many experiments and studies show that the essay or subjective type of test cannot be uniformly evaluated. Subjective test marking is subject to one's thinking at that particular moment. Little can be said for the subjective test, except for testing written expression. Students generally get less of a square deal through this type of an examination, and the estimate of the effectiveness of learning and teaching is inaccurate when compared with the objective type.

Written objective tests.

Objective written tests have certain advantages:

- a. A great number of questions can be asked so that the trade or field taught can be quickly and adequately tested.
- b. Students' reading and writing ability is minimized, so that ratings are on subject matter learned rather than on language skill.
- c. Scoring can be done by almost anyone.
- d. Scoring can be done quickly.
- e. The answer to any question is either right or wrong – there is no guessing as to the value

of any question.

f. The student is not penalized because of his attitude toward the instructor or the school.
Primary considerations in making objective tests.

One has at least eight choices of types of objective test questions. Applicable to all types explained in this section are general characteristics which should be followed:

a. Questions should be taken from subject matter taught.

b. Questions should be stated clearly and as briefly as possible.

c. Leading words should not be used. Avoid double negatives. Avoid patterns in answers, as when the first answer is always right in multiple choice questions, or when making alternate statements false in true-false tests.

f. Do not use ambiguous questions, which in some cases are true and in other cases false

If tests are teaching devices, then sufficient time should be allowed for testing all items taught. If we have the time to teach an item, then we must take the time to prove that each item has been taught, to determine the effectiveness of teaching. If an item is not tested, there is no way of proving that it has been learned. The above statements should not be construed to mean that testing should or can be made on all that a student might have gathered from the course. Testing should be done on all things actually taught, according to the objectives of a course.

Tests seek to see what students have learned. However, there can be other more complicated reasons as to why schools use tests.

At the school level, educators create tests to measure their students' understanding of specific content or the effective application of critical thinking skills. Such tests are used to evaluate student learning, skill level growth and academic achievements at the end of an instructional period, such as the end of a project, unit, course, semester, program or school year.

These tests are designed as summative assessments.

Summative assessments are defined by three criteria:

- They are used to determine whether students have learned what they were expected to learn or to level or degree to which students have learned the material.

- They may be used to measure learning progress and achievement and to evaluate the effectiveness of educational programs. Tests may also measure student progress toward stated improvement goals or to determine student placement in programs.

- They are recorded as scores or grades for a student's academic record for a report card or for admission to higher education.

Those who support standardized tests see them as an objective measure of student performance.

Those opposed to standardized testing see them as excessive. They dislike tests because tests demand time that could be used for instruction and innovation. They claim that schools

are under pressure to "teach to the test," a practice that could limit the curricula. Moreover, they argue that non-English speakers and students with special needs may be at a disadvantage when they take standardized tests.

Testing can increase anxiety in some students. In this way, the process of testing uncovers the quality of a student's academic achievement.

There are a number of reasons that teachers and school districts administer tests to students.

The obvious point of classroom testing is to assess what students have learned after the completion of a lesson or unit. When the classroom tests are tied to well-written lesson objectives, a teacher can analyze the results to see where the majority of students did well or need more work. This information may help the teacher create small groups or to use differentiated instructional strategies.

Educators can also use tests as teaching tools, especially if a student did not understand the questions or directions. Teachers may also use tests when they are discussing student progress at team meetings, during student assistance programs. Another use of tests at the school level is to determine student strengths. Tests can be used as a way to determine who will receive awards and recognition.

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QUALITATIVE AND QUANTITATIVE RESEARCH METHODS IN LANGUAGE: TESTING AND ASSESSMENT

КАЧЕСТВЕННЫЕ И КОЛИЧЕСТВЕННЫЕ МЕТОДЫ В ИССЛЕДОВАНИИ ЯЗЫКА (НА ПРИМЕРЕ ИСПОЛЬЗОВАНИЯ ТЕСТИРОВАНИЯ И ОЦЕНКИ)

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ABSTRACT

QUALITATIVE AND QUANTITATIVE
RESEARCH, ADVANTAGES, DISADVANTAGES,
TESTING AND ASSESSMENT

Our report deals with the advantages and disadvantages of using researchers qualitative and quantitative research methods and approaches for their studies of language testing and assessment. It is presented an overview of some of the strengths of using high-quality language research methods, namely, revealing a deeper understanding in the development and interpretation of assessment and testing, studying the behavior, perception, feelings and understanding of testees. Thus, having examined the essence of these two research paradigms, the quantitative paradigm prevails in the context of the study of language testing and assessment.

Аннотация

КАЧЕСТВЕННОЕ И КОЛИЧЕСТВЕННОЕ ИС-
СЛЕДОВАНИЕ, ТЕСТИРОВАНИЕ, ОЦЕНКА

В нашем докладе рассматриваются преимущества и недостатки использования исследователями различных дисциплин качественных и количественных методов и подходов в исследованиях языкового тестирования и оценки. В нем дается обзор некоторых сильных сторон использования качественных методов исследования языка, а именно, выявление более глубокого понимания при разработке и интерпретации оценки и тестирования, изучение поведения, восприятия, чувств и понимания тестируемых.

Qualitative and quantitative research approaches and methods are usually found to be utilised rather frequently in different disciplines of education such as sociology, psychology,

history, and so on. Whereas, the interpretive researchers oppose the positive belief of reality; and argue that, instead, the reality is socially constructed by the humans. They were also introduced in the research world though it was subsequent to research methods and approaches.

For the first half of the twentieth century, the positive model was dominant in social and educational research by giving importance of using standardised tests and systematic observation, experiment, survey data, and statistical analysis. In other words, the quantitative research method was quite powerful

But some period of time later there was a shift of research methods from quantitative to qualitative, and the superiority of quantitative research was not as powerful as before. The growth of qualitative research was also from the unhappiness with the process of generating knowledge within the positive research. Alongside the research methods and approaches, ethical considerations were also introduced in the research world though it was subsequent to research methods and approaches.

In a general sense, a test is something that demonstrates one's competence-incompetence, ability-inability; and that shows someone's position in the scale consisting of variables such as fail, pass, average, satisfactory, good, and excellent. An academic test also helps taking an important decision of whether or not a student will be allowed to move up to the next step. It can check the progress of a student and suggest whether a student needs more help or not, and allow us to compare the performance between students. The test, furthermore, acts as an important tool of public policy – such as the national examinations are held in the same standard across the country to ensure that only the top performers can get admission to the next level of education.

The university admission test (a high stake test) is a tool of this kind. In language testing, the testers are concerned with the extent to which a test can produce scores that reflect a candidate's ability accurately in a specific area, for example, reading, writing a critical essay, vocabulary knowledge, or spoken interaction with peers. Like all other educational assessments, language testing is a complex social phenomenon. But it is a significant aspect in education which affects people's lives in the society such as – promotion, employment, citizenship, immigration or asylum depends upon passing a language test. Another consequential factor of language testing in education is that it dictates what is to be taught. So, the discussion so far indicates that the language tests play an important role in many people's lives.

Defining qualitative research is significant as it is the central focus of this section – but there is a challenge to define this term clearly since it does not have its theory or paradigm nor an obvious set of methods or practices that are merely of its own. This term also involves a vast array of methods and approaches within the different subjects of research. Hence, the writers have provided the definition of qualitative research distinctively. So, the qualitative research is basically associated with multiple aspects. Qualitative research appears to be an

overarching concept under which a variety of issues may be placed, and it has positive and negative perspectives.

There are some benefits of using qualitative research approaches and methods. Firstly, qualitative research approach produces the detailed description of participants' feelings, opinions, and experiences; and interprets the meanings of their actions.

Secondly, there are some who argue that qualitative research approach understands the human experience in specific settings. Berg and Lune [1], for example, mentioned that qualitative research is an interdisciplinary field which encompasses a wider range of epistemological viewpoints, research methods, and interpretive techniques of understanding human experiences.

Thirdly, the qualitative research admits the researchers to discover the participants' inner experience, and to figure out how meanings are shaped through and in culture. Such as, in terms of assessing written assignments, "satisfactory", "good", or "60 marks out of 100" are used by the assessors, an investigation might be made in order to understand the meaning of "satisfactory" or "good" or to elicit the features of content or text displayed in the student scripts. So, the studies using qualitative approach can help us understand the markers' working assumption about what is to be assessed, and the meaning of the grade.

Lastly, qualitative research design (interactive approach) has a flexible structure as the design can be constructed and reconstructed to a greater extent (Maxwell, 2012). Thus, the thorough and appropriate analyses of an issue can be produced by utilising qualitative research methods, and therefore the participants have sufficient freedom to determine what is consistent for them. As a result, the complex issues can be understood easily.

For example, researchers acknowledged that, because of the nature of classroom dynamics, learners' behavior may be affected by the numerous factors outside of research focus. In this respect, the qualitative research approach is required to capture these dynamics. As the nature of language assessment practices is also complex, there is a suggestion by Blaikie N. [2] to employ the qualitative research methodology. Thus, the qualitative research can contribute to the understanding of the complex features of language assessment.

Beyond the above advantages, some limitations are obvious. There are some opinions that qualitative research approaches sometimes leave out contextual sensitivities, and focus more on meanings and experiences. Phenomenological approach, for instance, attempts to uncover, interpret and understand the participants' experience.

The study intended to critically look at the strengths and weaknesses of two crucial research paradigms in education – qualitative and quantitative – on the ground of language testing and assessment. It can be argued that the study has met the purpose as it is concerned with the critical demonstration of benefits and shortfalls of using each research methods and approaches, and of ethical considerations. The benefits of using qualitative research in language testing and assessment research are achieving deeper insight into designing, administering and

interpreting language assessment; easy to understand the candidate behaviour, interviewer behaviour, and cross-cultural influences on behaviour during the speaking tests, meaning of the score or grade, and the complex features of language assessment. Limitations, however, are: Small sample size sometimes makes the results unreliable; and policy makers may not ask for qualitative research. On the other hand, the study has figured out the advantages of using quantitative research in the context of language testing and assessment research, such as a larger size of sample and variables that make the testing research trust worthy. The disadvantages, nevertheless, are: Quantitative research leaves out the meanings and effects of a particular system – such as, a testing system is not concerned with the detailed picture of variables. Moreover, the study has found that the dominant method in the language testing and assessment research is quantitative due to basically its rate of use by the researchers around the world.

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METHODOLOGY FOR THE DEVELOPMENT OF STRATEGIC FORECASTS FOR THE PRODUCTION OF LIGHT INDUSTRY GOODS

МЕТОДИКА РАЗРАБОТКИ СТРАТЕГИЧЕСКИХ ПРОГНОЗОВ ПРОИЗВОДСТВА ТОВАРОВ ЛЕГКОЙ ПРОМЫШЛЕННОСТИ

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ABSTRACT

PRODUCT RANGE, FORECASTING, PRODUCTION OF LIGHT INDUSTRY GOODS, SEASONALITY OF DEMAND, TRENDS IN DEMAND

The article proposes a methodology for the development of light industry goods production forecasts in the Republic of Belarus. The data from the Statistical Annual published by the National Statistical Committee of the Republic of Belarus are taken as initial information. The method is based on the classical theories of seasonality of goods consumption, involving the construction of seasonal demand waves. The method of W. Parsons was chosen as the optimal method for constructing seasonal waves. After the construction of seasonal waves of demand for goods, a forecast of their production was made. Forecasting was carried out on the basis of statistical data of goods production from January 2010 to December 2018 and forecast values from January 2019 to December 2022 using a linear trend.

АННОТАЦИЯ

ТОВАРНЫЙ АССОРТИМЕНТ, ПРОГНОЗИРОВАНИЕ, ПРОИЗВОДСТВО ТОВАРОВ ЛЕГКОЙ ПРОМЫШЛЕННОСТИ, СЕЗОННОСТЬ СПРОСА, ТЕНДЕНЦИИ ИЗМЕНЕНИЯ СПРОСА

В статье предлагается методика разработки прогнозов производства товаров легкой промышленности в Республике Беларусь. В качестве исходной информации взяты данные из статистического ежегодника, издаваемого Национальным статистическим комитетом Республики Беларусь. Методика основывается на классических теориях сезонности потребления товаров, предполагающих построение сезонных волн спроса. В качестве оптимального метода построения сезонных волн выбран метод У. Парсонса. После построения сезонных волн спроса на товары был составлен прогноз их производства. Прогнозирование осуществлялось на основании статистических данных производства товаров с января 2010 по декабрь 2018 гг. и прогнозных значений с января 2019 по декабрь 2022 год при помощи линейного тренда.

At the present stage of development of the economy of the Republic of Belarus, the tasks of improving the management of the product range are of particular relevance. However, these tasks are far from being fully resolved. Producers do not sufficiently take into account the changes in demand during optimizing of the assortment and developing production programs.

The issues of goods production forecasting are also of high importance. By analyzing trends in demand, developing goods consumption forecasts and possible consumer preferences, the company will be able to develop the optimal range and successfully manage it.

When studying the issues of market forecasting, one of the important directions of diagnostics of its development is the analysis of seasonality of demand.

The reasons for seasonal fluctuations are explained by the features of product supply and consumer demand in different periods of the year. The problem of eliminating the influence of seasonality of light industry goods sales can be solved by identifying the features of consumer demand for the relevant goods changing during the year in order to fully satisfy the existing demand. To achieve this goal, it is necessary to deeply and systematically study the seasonality in the sale of each product in the market.

As a result of the analysis of methods for predicting the development of regional commodity markets taking into account seasonal fluctuations it is determined that the most accurate are the methods by which the measurement is made directly on the basis of empirical (statistical) data without their preliminary processing.

Thus, the W. Parsons method was chosen as the optimal method of forecast development, which allows eliminating the error caused by the influence of the general trend with the help of the average coefficient of rise (decrease) of the general trend in complex percentages [1].

The data from the statistical yearbook published by the National Statistical Committee of the Republic of Belarus are taken as initial information [2].

Analysis and calculation of forecast values was carried out for the following light industry goods: fabrics, carpets and carpet products, knitwear, hosiery, shoes.

At the same time, to make the forecast more accurate, the data were used in natural units of measurement, which did not require adjustments to take into account the level of inflation.

To obtain the forecast values for September - December 2019, the simple moving average method was used.

On the basis of the data obtained using the method of W. Parsons seasonal waves of production of fabrics, carpets and carpets, knitwear, hosiery, shoes are constructed taking into account the demand.

The following results are obtained from the constructed seasonality curves:

- the maximum volume of production of fabrics falls on the period from April to June, the minimum-from July to September;
- the maximum volume of production of footwear falls on the period from April to June, the minimum – from October to December;

- the maximum volume of production of knitted products falls on the period from October to December, the minimum – from July to September;
- the maximum volume of production of hosiery and carpets falls on the period from April to June, the minimum – from July to September.

After the construction of seasonal waves of production of fabrics, carpets and carpet products, knitted and hosiery, and footwear goods, the production forecast for light industry goods by Belarusian manufacturers was made taking into account the dynamics of demand and seasonality. Forecasting was carried out on the basis of statistical data [2, p.287] production of goods from January 2010 to December 2018 and forecast values from January 2019 to December 2022 using a linear trend. Table 1 presents the forecast values of the volume of production of light industry goods from 2019 to 2022.

Table 1 – Forecast values of production volumes of light industry goods from 2019 to 2022

Goods	2019	2020	2021	2022
Carpets and carpet products, thousand of square meters	1720	1648	1577	1505
Fabrics, millions of square meters	164.1	163.6	163.0	162.5
Knitwear, million pieces	35.4	32.0	28.5	25.0
Hosiery, million pairs	173.8	179.9	185.9	191.9
Shoes, million pairs	7.3	6.0	4.8	3.6

As a result of the calculated values for the production of light industry goods, a sharp reduction in the production of carpets, knitwear and shoes, a slight decrease in the production of fabrics and a distinct increase in the production of hosiery are projected.

The seasonal waves of production of fabric, carpets and carpet products, knitted and hosiery products, as well as shoes confirm the seasonal nature of the production of these goods.

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OPPORTUNITIES FOR USING ANTI-CRISIS MARKETING BY BELARUSIAN LIGHT INDUSTRY ENTERPRISES

ВОЗМОЖНОСТИ ИСПОЛЬЗОВАНИЯ АНТИКРИЗИСНОГО МАРКЕТИНГА БЕЛОРУССКИМИ ПРЕДПРИЯТИЯМИ ЛЕГКОЙ ПРОМЫШЛЕННОСТИ

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ABSTRACT

ANTI-CRISIS MARKETING, CHANGES IN THE EXTERNAL AND INTERNAL ENVIRONMENT, THE BUSINESS PORTFOLIO OF THE ENTERPRISE, CONSUMER, BRANDING

The article deals with the main aspects of the problems of crisis situations that periodically appear in the enterprises of light industry, and prevent its normal functioning. A detailed analysis of the stages of overcoming the crisis and examples of their application in practice. The proposals for the correction of the positioning of the company's brands and ways to find new reserves of development are presented. Features of anti-crisis marketing and its implementation at the enterprise are revealed. The stages of implementation of anti-crisis marketing, such as analysis of the situation on the market, correction of positioning of brands of the enterprise, innovative search of reserves of development which have to be included in strategy of management are defined.

АННОТАЦИЯ

АНТИКРИЗИСНЫЙ МАРКЕТИНГ, ИЗМЕНЕНИЯ ВНЕШНЕЙ И ВНУТРЕННЕЙ СРЕДЫ, БИЗНЕС-ПОРТФЕЛЬ ПРЕДПРИЯТИЯ, ПОТРЕБИТЕЛЬ, БРЕНДИНГ

В статье рассмотрены основные аспекты проблем кризисных ситуаций, периодически появляются на предприятиях легкой промышленности, и препятствующих его нормальному функционированию. Приведен детальный анализ этапов преодоления кризиса и примеры их применения на практике. Изложены предложения по коррекции позиционирования брендов предприятия и пути поиска новых резервов развития. Выявлены особенности антикризисного маркетинга и его реализации на предприятии. Определены этапы реализации антикризисного маркетинга, такие как: анализ ситуации на рынке, коррекция позиционирования брендов предприятия, инновационный поиск резервов развития, которые должны включаться в стратегию управления.

Modern enterprises of light industry face with the problem of establishing effective crisis management. While identifying the problems that caused the crisis in the enterprise, some organizations underestimate the role of anti-crisis marketing. However, in order to ensure the survival of national enterprises, program based on marketing strategies needs to be developed and put into practice. In order to properly form an anti-crisis marketing program, it is necessary to identify ways to implement it.

The issues of anti-crisis marketing and the stages of its implementation at the enterprise were studied by such foreign authors as G. Hit [1], M. S. Sitrik [2] and others. It is worth noting that the idea of implementing anti-crisis marketing belongs to American scientists and economists who were interested in some aspects in the 1990s. In Belarus, this practice has appeared quite recently.

The crisis state of the enterprise in terms of marketing means its non-competitiveness. This state does not occur instantly. The process of transition to the crisis begins with a gradual deterioration of such economic indicators of the enterprise as sales, profit, profitability, goodwill, etc. This is especially enhanced in the context of the overall economic crisis, when enterprises and society are in search for new directions of development.

During the crisis, it is necessary to apply specific marketing, the essence of which is to promptly change the marketing policy of the organization and all the tools of the marketing [3, 4].

In times of a stable market, the marketing policy of any enterprise changes little and does not make any significant adjustments to the activities of already established production. However, with the onset of the crisis, everything changes dramatically, and the usual marketing activity is replaced by anti-crisis marketing.

The essence of anti-crisis marketing is the rapid change of all marketing components, depending on changes in the external and internal environment. This allows the company to be as competitive as possible in the economic conditions that are changing. This is the so-called marketing of "survival" in a new, changing environment [1].

During the development of the crisis, the following main stages can be distinguished: a decrease in sales and profits; reduction of production; the emergence of unprofitable productions; lack of own funds and reserve funds, a sharp decline in solvency; a state of acute insolvency [4].

The role of marketing in crisis management today is to give an answer about the future prospects of the business, as well as to provide a tool to achieve the goals of the enterprise and to ensure development.

Crisis marketing includes the following actions [1]:

1. Diagnostics of the state of the enterprise:
 - the recognition of crisis;
 - a threat assessment, scope of the crisis;

- assessment of the potential consequences of this situation.

2. Definition of objectives:

- immediate task;
- development plans of the enterprise.

3. Identifying ways to achieve goals:

- marketing mix;
- reorganization (restructuring) of the enterprise.

4. Efficiency evaluation:

- testing of the proposed activities;
- the degree of tasks fulfillment;
- assessment of the effectiveness of the activities.

5. Adjustment of short-and medium-term actions.

Consider the stages of crisis marketing.

1. Analysis of the market situation. Businesses must:

- hold the forecast volume changes of the market;
- assess the development trends of products;
- determine changes in distribution channels and the importance of the factors determining the choice of buyers,
- enhance the communication with consumers.

2. Analysis of the business portfolio of the enterprise. In the course of such analysis, it is necessary to identify the products of the enterprise that have outlived their cycle and tend to "die", that is, over time, bring less profit or become unprofitable. After a preliminary analysis, it is necessary to remove the costs of artificially maintaining the sales of this product or develop a plan to get rid of it.

3. Reducing the portfolio of brands. This should primarily apply to enterprises with more than two brands in the same category. This will help enterprises to reduce costs and focus on the largest and most important target groups. Great attention should be paid to the definition of the brand with the greatest resource, the greatest resistance to the aggressive market environment.

4. Analysis and correction of brand positioning (price, ideological, assortment). Competent branding is in crisis as never essential tool for occupation by the enterprise its niche and gaining regular customers.

5. Innovations. The introduction of innovative technologies during the crisis is a rather risky step. But for some businesses, it may be the only way to stay in the market. As for the conclusion of a traditional brand, before launching an innovation, it is necessary to assess the capabilities of the enterprise and carefully analyze its target audience, understand how their views and preferences have changed, and what they need today.

Also the following aspects are particularly important in the framework of anti-crisis

marketing: efficiency, i.e., rapid response and adaptation to market conditions, and the quality of sales products. As for the second aspect, it is quite risky for light industry enterprises that are aimed at a positive long-term result to sacrifice quality, since it is their main strategic support.

Therefore, enterprises that are in crisis need measures that would help to maintain demand for products. So, the marketing approach to solving the main problems of the enterprise during the crisis will help it not only to absorb a shock, but also to support the activity of the business.

Considering all of the above, we can conclude that the crisis in the development of the enterprise and the market requires analysis and development of stages to overcome it.

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PROBLEMS OF EVALUATING THE EFFECTIVENESS OF UNIVERSITY-TYPE TECHNOLOGY PARKS

ПРОБЛЕМЫ ОЦЕНКИ ЭФФЕКТИВНОСТИ ДЕЯТЕЛЬНОСТИ ТЕХНОПАРКОВ УНИВЕРСИТЕТСКОГО ТИПА

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ABSTRACT

INNOVATIVE INFRASTRUCTURE,
TECHNOLOGY PARK, PROBLEMS OF
EVALUATING EFFECTIVENESS, ANALYTICAL
SUPPORT OF BUSINESS

The article discusses the main problems that arise when evaluating the effectiveness of technology parks, based not only on the provision of commercial services, but also on the implementation of educational, scientific and research activities. The expediency of further studying these problems and finding ways to solve them is rationalized. The necessity of highlighting a separate direction for assessing the activities of a university-type industrial park - social, associated with its participation in the educational and scientific processes of the university is pointed out.

АННОТАЦИЯ

ИННОВАЦИОННАЯ ИНФРАСТРУКТУРА,
ТЕХНОПАРК, ПРОБЛЕМЫ ОЦЕНКИ ЭФФЕК-
ТИВНОСТИ, АНАЛИТИЧЕСКОЕ ОБЕСПЕЧЕ-
НИЕ БИЗНЕСА

В статье рассматриваются основные проблемы, возникающие при оценке эффективности деятельности технологических парков, базирующихся не только на оказании коммерческих услуг, но и осуществлении образовательной, научной и исследовательской деятельности. Обоснована целесообразность дальнейшего изучения данных проблем и поиска путей их решений. Отмечена необходимость выделения отдельного направления оценки деятельности технопарка университетского типа – социального, связанного с его участием в образовательных и научных процессах университета.

One of the main strategic development goals of the Republic of Belarus is the transition of the country's economy to an innovative type of development, which, in turn, requires the creation of a special infrastructure, the increase in the functioning efficiency of which is one of

the main levers for the development of small and medium-sized innovative entrepreneurship.

Based on national and foreign experience, we can conclude that the most promising and financially attractive subjects of innovation infrastructure are technology parks and technology transfer centers.

In accordance with the State Program for Innovative Development of the Republic of Belarus 2016–2020 the task is to ensure the activity of 19 technology parks by 2020, bring the number of technology park residents to 300 and create 1536 new jobs [1].

According to the data provided by the State Committee for Science and Technology, on the development of technology parks (table 1), we can conclude that there are positive trends in the main indicators of their performance.

Table 1 – Development of technology parks 2014-2020

Indicator	...	2014	...	2017	...	2020 (project)
The number of technology parks, units		12		14		19
The number of residents, units		84		133		300
Dynamics of job creation, units		125		493		1536
Dynamics of products manufactured by residents, thousand rubles (den.)		2,9		8,7		15
Including innovation, thousand rubles		1,97		5.91		10

Source: compiled from [1, 2]

Currently, there are 16 scientific and technological parks in the Republic of Belarus [2, 3], of which about 56 % have higher educational institutions as founders. Most of the technology parks among the services provided highlight educational events, programs, courses within the framework of innovative topics.

The study of national and foreign experience in the formation and functioning of technology parks allows us to define a university-type technology park as a special type of data for economic entities. The basis for such a statement is the fact that the activities of a university-type industrial park cannot be considered in isolation from its participation in the educational and scientific process of the founding university. Therefore, a differentiated approach is needed to evaluate the activities of technology parks created at universities and technology parks created by large commercial structures.

Today, theory and practice offer many approaches to assessing the effectiveness of the functioning of technology parks.

So, in the scientific article "Problems of Evaluating the Efficiency of Technoparks in Russia" [4], the author notes such key ones as the number of jobs created, the number of new

companies created, the number of companies located in the technopark, and so on.

Irina Prilutskaya in the scientific article "Problems of Evaluating the Effectiveness of the Functioning of Innovation Infrastructure" [5] identifies the following indicators: the number of patents received, the amount of financing, the number of completed projects, the number of scientists, the number of companies, and the realizable value of projects.

The Ministry of Finance of the Russian Federation, in order to characterize the detail of technology parks, identifies the following areas of analysis of their effectiveness: economics, human capital, regional development, technological development, organizational structure [6]. For each category, a number of characteristics are identified that can be used to establish the dynamics in the corresponding direction of activity.

The procedure for evaluating the effectiveness of technology parks, approved by the Department of Industry and Transport of the Voronezh Region [7], is based on blocks of indicators: general information about the technology park, information about the infrastructure of the technology park, information about innovative activities, information about payments to the budget, information about residents of the technology park.

Belarusian authors propose to supplement the system of performance indicators of the technopark with profitability and liquidity of the balance sheet [8].

A study of these and other approaches to assessing the effectiveness of technology parks enables to conclude that none of the developed methods covers such an area of activity of science and technology parks as educational. In our opinion, in order to fully characterize the effectiveness of the functioning of university-type technology parks, three blocks of indicators should be applied: economic (revenue, costs, investments, etc.), innovative (the number of patents and projects received, the number of innovative products sold, etc.) and social (characterizing participation of the technopark in the educational and scientific processes of the university). The choice of indicators of the latter block requires additional research and study of the opinions of various groups of stakeholders.

Any assessment of the activity of an economic entity is based on the availability of developed methods, indicators, and sufficient information support. Today, in connection with this, the most urgent problem in assessing the activities of a university-type industrial park is the development of analytical support that fully covers all the specifics of the activity, and is presented in the form of certain analytical procedures, information flows, a set of indicators that allow you to generate a final report on the technology park's activity, which will serve not only as a reporting form to higher bodies, but also as a reporting for the university, as well as a tool for attracting new residents and investors.

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PROBLEMS OF THE DEVELOPMENT OF INTELLECTUAL CAPITAL OF THE REPUBLIC OF BELARUS IN THE CONTEXT OF FORMATION OF POST-INDUSTRIAL ECONOMY

ПРОБЛЕМЫ РАЗВИТИЯ ИНТЕЛЛЕКТУАЛЬНОГО КАПИТАЛА РЕСПУБЛИКИ БЕЛАРУСЬ В КОНТЕКСТЕ ПРОЦЕССА ФОРМИРОВАНИЯ ПОСТИНДУСТРИАЛЬНОЙ ЭКОНОМИКИ

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ABSTRACT

INTELLECTUAL CAPITAL, PARADIGM
OF SUSTAINABLE SOCIO-ECONOMIC
DEVELOPMENT, POST-INDUSTRIAL ECONOMY

With the integration of the economy into the world space and the formation of a post-industrial society and the economy of knowledge, intellectual capital and people become not only factors, but also the goal of economic development. The article analyzes the main indicators of the development of intellectual capital of the country, such as the dynamics of the number of scientific organizations, the number and structure of personnel, the material base of scientific organizations, the share of public sector spending on research and development in GDP. Here we formulate the main directions of development of intellectual capital in the economy of the Republic of Belarus.

АННОТАЦИЯ

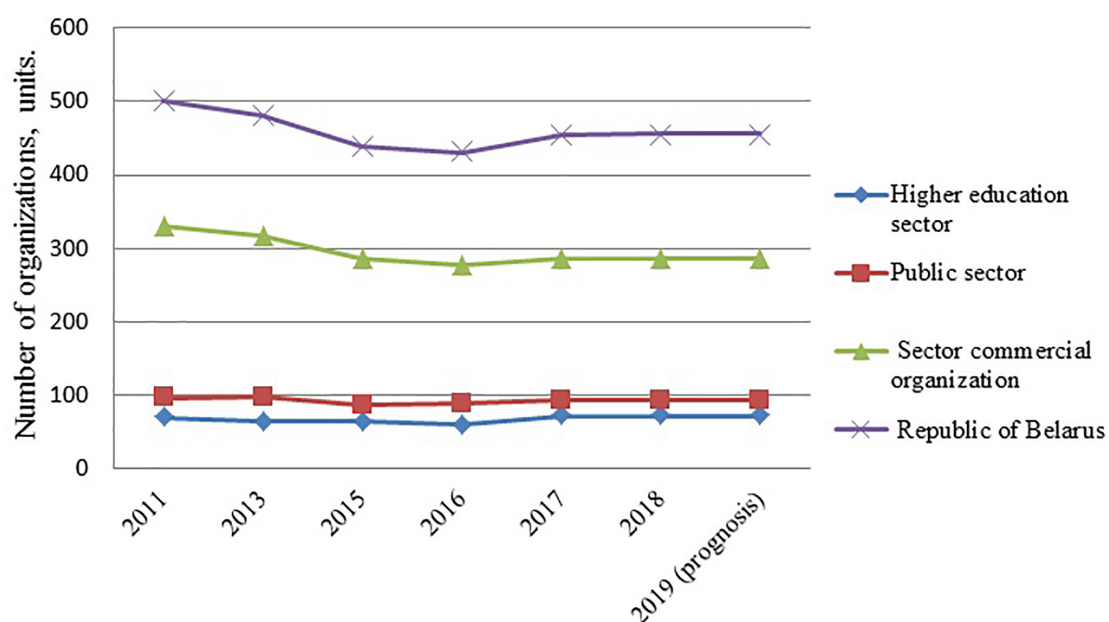
ИНТЕЛЛЕКТУАЛЬНЫЙ КАПИТАЛ, ПАРА-
ДИГМА УСТОЙЧИВОГО СОЦИАЛЬНО-ЭКО-
НОМИЧЕСКОГО РАЗВИТИЯ, ПОСТИНДУ-
СТРИАЛЬНАЯ ЭКОНОМИКА

В условиях интеграции экономики в мировое пространство и формирования постиндустриального общества и экономики знаний, интеллектуальный капитал и его носитель человек становятся не только факторами, но и целью экономического развития. В статье анализируются основные показатели развития интеллектуального капитала страны, такие как динамика численности научных организаций, численность и структура кадрового состава, материальная база научных организаций, доля расходов государственного сектора на НИОКР в ВВП. Формулируются основные направления развития интеллектуального капитала в экономике Республики Беларусь.

The integration of Belarus into civilizational world economic relations, and the related processes of liberalization of international trade, greening of economic activity, the processes of creating a post-industrial society, have led the country to the need to form a paradigm of sustainable socio-economic development. Here a person will become not just a factor of development, but its main goal. These processes cause a change in the role and importance of intellectual capital, the formation of the so-called knowledge economy. In this regard, the problems of research of qualitative and quantitative indicators of intellectual capital development in Belarus are of particular importance.

The most important indicators of the quality and productivity potential of scientific and scientific-technical activities are: the number of scientific organizations; the volume and structure of research and development; the number and structure of scientific personnel; the sources of funding and spending on research developments; and the material-technical base, etc.

Here we analyze the dynamics of the number of organizations engaged in research and development (fig. 1).



Source: by the author on the basis of [1]

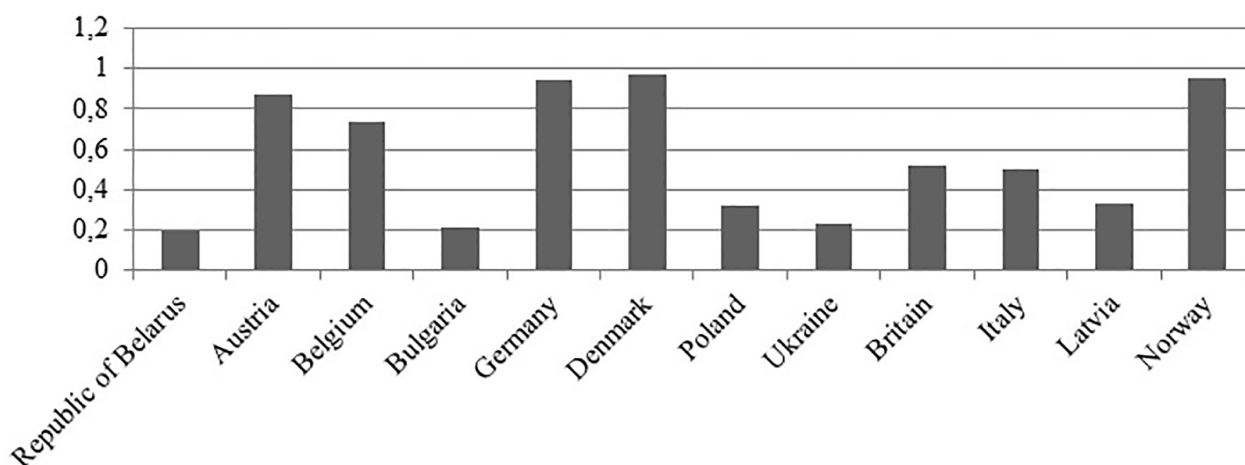
Figure 1 – Number of organizations engaged in research and development

According to the analysis of data on the Republic of Belarus, the number of scientific organizations in recent years has decreased significantly (over the past 8 years by 47 units or more than 9 %). At the same time, the reduction in the number of organizations affected both organizations with state ownership and commercial organizations operating in the field of scientific research and development (Fig.2). There was a significant reduction in the number of non-governmental sector organizations (13.5 %) and a less significant reduction

in public sector organizations (3 %). This is due to funding opportunities for the last of the state budget funds. The main reason of the negative dynamics of indicators of the number of research organizations is the reduction in demand for the national innovative product and its displacement from the domestic market. This is largely due to the overall reduction in the number of researchers, and hence the volume of research works. So in the 1990 s there was a decrease in number of researchers by 3.3 times [2]. Currently, the trend of reducing the number of scientific personnel remains.

At the same time, changes in the age structure of researchers occur in an unfavorable direction. From science there is an outflow of the most productive middle-aged 30-39 years. The proportion of researchers aged 30-39 has decreased from 32.3 % to 24.2 % over the past 15 years, and over 60 has increased from 2.1 % to 19.0 %. At the same time, the share of doctors of Sciences aged 30-39 years is only 0.47 % of their total number [1]. Such age structure of scientific potential is dangerous by loss of continuity required for reproduction of scientific schools.

The low share of public sector expenditure on research and development in GDP is also a significant problem. Although it has increased from 0.17 % to 0.19 % in 10 years, it is still significantly lower than in other developed countries (Fig. 2).



Source: developed by the author on the basis of [1]

Figure 2 – Share of public sector expenditure (including higher education) on research and development in GDP (EIS-2018), in %.

Another problem is the significant depreciation of the fixed capital of scientific organizations. The analysis showed that 1/3 of their buildings have more than 60 %, and more than half of 40 % wear. The average annual coefficient of renewal of the active part of production facilities is only 5 %, which is almost 3 times lower than the level recommended by modern economic science [2].

In the context of globalization, integration and the formation of a single economic space, the problems of development of the scientific potential of the Republic of Belarus turn into a problem of "survival" of the national economy in the modern world economic system. The country implements a system of measures to develop the national intellectual capital through a number of program documents such as "Belarus 2020: Science and Economy", "Science and Technology: 2018-2040" and others. However, as the analysis has shown, there are still a number of serious problems in the development of intellectual capital of the country.

Building up the intellectual component in the conditions of integration processes in the economy should be provided in three main directions: building scientific competence and increasing the mobility of scientific personnel; strengthening relationships and interaction in science and innovation; transformation of Belarus into an IT country. At the same time: first, measures related to improving the efficiency of the use of intellectual capital should be comprehensive; secondly, the essential point is to solve the personnel problems of the development of domestic science and education, which are associated with the improvement of material incentives for the work of scientists. It will increase the number of scientific personnel and improve their age structure; third, in the context of the predominance in the national economy of large enterprises with high share of public capital, it is necessary to develop public-private partnerships, implemented through the mechanism of self-financing of scientific and technical sphere. On this basis we should attract the commercial sector more widely in the processes of intellectual capital formation; fourth, these measures should be supported by creation of favorable conditions for investments in knowledge-intensive production, including on the basis of tax benefits for enterprises that use intellectual capital.

To a certain extent, the implementation of these measures will solve a number of problems facing the development of Belarusian science and will contribute to the growth of the effectiveness of the use of the intellectual potential of the country.

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UDC 658

RETURN OF ASSETS AS A FINAL INDICATOR OF EFFICIENCY OF BUSINESS OPERATION

РЕНТАБЕЛЬНОСТЬ АКТИВОВ КАК ИТОГОВЫЙ ПОКАЗАТЕЛЬ ЭФФЕКТИВНОСТИ ФУНКЦИОНИРОВАНИЯ БИЗНЕСА

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ABSTRACT

*BUSINESS PERFORMANCE, ASSETS, ASSET
STRUCTURE, ASSET UTILIZATION, RETURN ON
ASSETS, MULTI-FACTOR MODEL*

Assessing business performance poses one of the most important tasks, which is to determine the role of the volume and structure of resources, on the one hand, and the level of use of available resources, on the other hand. The study attempts to build a multifactor model of return on assets based on a systematic approach to business performance indicators combining business assets, the efficiency of their use in the production process and the final result in the form of net profit.

АННОТАЦИЯ

*ЭФФЕКТИВНОСТЬ БИЗНЕСА, АКТИВЫ,
СТРУКТУРА АКТИВОВ, ИСПОЛЬЗОВАНИЕ АК-
ТИВОВ, РЕНТАБЕЛЬНОСТЬ АКТИВОВ, МНО-
ГОФАКТОРНАЯ МОДЕЛЬ*

Оценка эффективности бизнеса ставит перед собой одну из важнейших задач – определение роли объема и структуры ресурсов, с одной стороны, и уровня использования имеющихся ресурсов, с другой стороны. В исследовании предпринята попытка построения многофакторной модели рентабельность активов на основе системного подхода к показателям функционирования бизнеса, объединяющего активы бизнеса, эффективность их использования в процессе производства продукции и итоговый результат в виде чистой прибыли.

The transition to a market economy is changing the content and criteria for evaluating business performance. Of course, this also affected a key indicator of the effectiveness of the organization's functioning, i.e. its profitability. If earlier in the practical assessment of the activity of an industrial organization the indicator of profitability of products was predominant, now it is adjacent to the indicator of profitability of sales.

Modern economic science has developed many approaches and indicators to assess the level of business profitability. However, all the opinions of scientists and economists are limited to the fact that a comprehensive assessment of business profitability should be based on the profitability of assets, since the founders entrusted their assets to the organization's management in order to make a profit. Despite the fact that this point of view has supporters, there still exist opponents, according to the authors, the indicator of return on assets allows to get an idea of the profitability of different companies, different types of economic activity and makes it possible to compare them.

An assessment of business performance by the final indicator "return on assets" can be presented in the form of a "black box" model [1], in which an organization is considered as some system where there are the following components:

- "Input" is the initial assets of the organization, structural indicators that are at the stage before the production process; they are characterized by indicators of their value, condition, structure;
- "System" is the production process itself, where the process of using the organization's assets is presented, the effectiveness of which can be evaluated by various approaches: resource or cost;
- "Exit" is the final indicator of the organization's activity, which shows the result of the use of assets: sales volume, added value, profit, and so on.

This model closes the final indicator of the organization's activity, which can be determined by the ratio of "output" to "input".

For example, the general view of the final indicator can be represented by the return on assets determined by the formula:

$$R_a = \frac{NP}{LTA + STA}, \quad (1)$$

where NP – net profit of the organization (output indicator);

LTA, and STA are long-term and short-term assets of the organization (entry indicators) accordingly.

The presented model, combining the multiple and the additive, can be detailed by the sequential separation of factors. This will allow combining the indicators of "entry", "system" and "exit" in one model. In this study, the following indicators were selected at the "input": assets; long-term assets; intangible assets; short-term assets; accounts receivable.

To characterize the production system, the use of indicators of return and capacity is justified:

- an indicator of the capacity of manufactured products, calculated for short-term assets;
- the rate of return of receivables;
- capacity indicator calculated on long-term assets;

- the rate of return on intangible assets.

At the "exit", the net profit indicator is used as the final indicator.

The final indicator "return on assets", covering all the components of the black box model as a result of fragmentation of factors is converted into a model:

$$R_a = \frac{NP}{\frac{STA}{VP} \times \frac{VP}{AR} \times \frac{AR}{STA} \times A \times \frac{STA}{A} + \frac{LTA}{VP} \times \frac{VP}{IA} \times \frac{IA}{LTA} \times A \times \frac{LTA}{A}}, \quad (2)$$

where VP is the volume of products, works and services;

AR is accounts receivable;

A is the total amount of assets of the organization;

IA is intangible assets.

Each denominator ratio has an independent economic meaning, which allows to present the model in the form:

$$R_a = \frac{NP}{STA_e \times AR_o \times d_{AR} \times A \times d_{STA} + LTA_e \times IA_o \times d_{IA} \times A \times d_{LTA}}, \quad (3)$$

where STA_e is the indicator of the capacity of manufactured products calculated on short-term assets;

AR_o is return of receivables;

d_{AR} is the share of receivables in the total amount of short-term assets;

d_{STA} is the share of short-term assets in the total assets;

LTA_e is the indicator of the capacity of manufactured products calculated on long-term assets;

IA_o is return on intangible assets;

d_{IA} is the share of intangible assets in the total amount of long-term assets;

d_{LTA} is the proportion of long-term assets in the total amount of long-term assets.

This model was tested at the private enterprise "Machine-Building Company Vitebsk Aerial Platforms". The main results are presented in Table 1.

According to the results of the study, the following results were revealed:

1. of the "entry" indicators, the negative impact on the change in the return on assets was affected by such factors as the share of short-term assets in the total assets, the assets of the organization and the share of intangible assets in the total amount of long-term assets; this is due to the fact that in multiple models an increase in the denominator leads to a decrease in the indicator.

2. From the indicators of the "system", negative factors influencing the change in the return on assets were affected by such factors as the indicator of the capacity of manufactured

Table 1 – The Impact of changes in factors on the return on assets in the analyzed period

Factor Name	The result of the influence of the factor
Organization net income	42,559
The indicator of the capacity of manufactured products calculated on short-term assets;	-19,903
Return of receivables;	18,980
The share of receivables in the total amount of short-term assets	0,923
The total amount of the organization's assets	-32,589
The share of short-term assets in the total assets	-4,401
The indicator of the capacity of manufactured products calculated on long-term assets	1,349
Return on intangible assets	8,908
The share of intangible assets in the total amount of long	-10,256
The proportion of long	4,401

Compiled by the author

products calculated on short-term assets.

The final result of the work done will be considered to determine the influence of extensive and intensive factors on the final indicator of the effectiveness of the functioning of an industrial organization through living labor, means of labor and objects of labor.

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JEL classification: M1

AN OVERVIEW OF THE IMPLEMENTATION OF CORPORATE SOCIAL RESPONSIBILITY IN LEBANON

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ABSTRACT

CORPORATE SOCIAL RESPONSIBILITY, LEBANESE BANKS, UN GLOBAL COMPACT, STAKEHOLDERS' THEORY, SHAREHOLDERS' THEORY, CORPORATE PHILANTHROPY

Corporate Social responsibility has become one of the pillars of doing business in the world. The public has been giving growing attention to the commitment of companies towards implementing CSR within their operations. The purpose of this paper is to provide an overview of the application of CSR in Lebanon shedding the light on the different approaches that Lebanese companies follow.

INTRODUCTION

Since the emergence of the concept, Corporate Social Responsibility (CSR) has been one of the hottest topics of discussion in the business domain in general and in business ethics in particular. CSR is a form of self-regulation that aims to direct enterprises into operating in a more socially aware manner. In other words, CSR encourages business entities to contribute towards social goals like the well-being of the environment, the community, employees, and the various stakeholders. Traditionally, the shareholders' theory dominated the way firms operate; the sole aim of corporations was to generate economic profit which is the number one concern of shareholders. However, corporations got so large in size that the impact of their operations extended to affect multiple parties. CSR introduced a new theory of operations, which is the stakeholders' theory. The stakeholders' theory states that corporations should take into consideration the impact of their operations on all parties including suppliers, the environment, the community, employees, and profit (Fontaine, 2006).

CORPORATE SOCIAL RESPONSIBILITY IN LEBANON

While exploring the practice of corporate social responsibility in Lebanon, we notice that the main business entities committed to it are banks and financial institutions. Since banking is the strongest sector within the Lebanese economy and because financial institutions are the largest corporations in Lebanon, they have a sense of responsibility to operate in a social

manner. In addition to their annual report, almost all Lebanese banks publish an annual social responsibility report that highlights their contribution towards society throughout the year.

EXAMPLES OF CSR IN LEBANON

For instance, Byblos Bank Sal divides its CSR activities into four different focus areas: education, culture, environment, and community. The bank refers to its approach as a "humanization of capital" tactic. With respect to education, the bank's main strategy is to invest in the renovation of academic campuses and offering scholarships to students in need. At the level of culture, Byblos's main involvement includes also renovation projects for old cultural markets like the ones in Jbeil and Batroun. As for the environment, Byblos bank works mainly on reforestation campaigns to increase green areas in Lebanon. Finally, at the level of community, the bank mainly supports infrastructure projects as part of its support for the society (Byblos Bank, 2018). On the other hand, other alpha banks in Lebanon also share a similar approach towards CSR where they invest a portion of their earnings on projects that aim towards the development of the community.

DOMINANT CSR APPROACHES IN LEBANON

However, after analyzing the Lebanese landscape for the implementation of CSR, we noticed that all involved firms share a similar approach; the majority of Lebanese corporations follow a philanthropic approach towards CSR. In other words, they act like charities by providing capital for social causes. Nevertheless, the domination of this approach highlights the misconception in Lebanon between Corporate Philanthropy and Corporate Social Responsibility. Corporate philanthropy is donating financial resources or time for a social cause. On the other hand, the essence of corporate social responsibility is to integrate social practices within the core of the firm's operations (Lazzari, 2018). To highlight the difference, let's consider the following example: A huge manufacturing firm that does not abide by green standards in its operations donates an annual amount of \$1 million to philanthropy. Another small firm operates in a socially responsible manner and uses sustainable means in its operations yet does not donate any amount to charity. The negative impact of the large firm's operations on the community are much larger and more severe than the effect of its donations.

CONCLUSION

In recent years some Lebanese companies, and mainly banks, announced that they have joined the UN Global Compact and are committed to respect its ten principles. One of the leading Lebanese firms at this level is Blom Bank Sal that has agreed to submit an annual communication that briefs its stakeholders concerning its progress with regards to the Global Compact principles (Blom Bank, 2018). Our research allows notice that Lebanese banks are the main firms in Lebanon committed to implement CSR in their operations. The reason behind

that is the Central Bank's close guidance that aims at restoring the public faith in the business sector. In addition, these banks apply corporate philanthropy rather than corporate social responsibility. Thus, Lebanon still has a long road to cross with respect to CSR. The first steps should be commitment from more firms and implementation of new approaches.

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THEORETICAL ASPECTS OF DETERMINING THE POTENTIAL OF THE ENTERPRISE

ТЕОРЕТИЧЕСКИЕ АСПЕКТЫ ОПРЕДЕЛЕНИЯ ПОТЕНЦИАЛА ПРЕДПРИЯТИЯ

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ABSTRACT

POTENTIAL, THE POTENTIAL OF THE ENTERPRISE, THE STRUCTURING OF THE ENTERPRISE POTENTIAL, COMPONENTS OF POTENTIAL OF THE ENTERPRISE

In modern conditions of unstable economic environment the issues of search of effective ways of maintenance of stable, effective and profitable activity of economic entities become more and more topical. Different theoretical approaches and features of their direction cause a different number of components of the enterprise potential, and, consequently, its structural composition. The structuring of capacity is an important aspect for its formation and future use. The article analyzes the approaches to the definition of the term "potential"; investigated the essence of the potential of the enterprise.

АННОТАЦИЯ

ПОТЕНЦИАЛ, ПОТЕНЦИАЛ ПРЕДПРИЯТИЯ, СТРУКТУРИЗАЦИЯ ПОТЕНЦИАЛА ПРЕДПРИЯТИЯ, СОСТАВЛЯЮЩИЕ ПОТЕНЦИАЛА ПРЕДПРИЯТИЯ

В современных условиях нестабильной экономической среды все более актуализируются вопросы поиска эффективных способов обеспечения стабильной, результативной и прибыльной деятельности хозяйствующих субъектов. Различные теоретические подходы и особенности их направления обуславливают разное количество составляющих потенциала предприятия, а, следовательно, и его структурное строение. Структуризация потенциала является важным аспектом для его формирования и предстоящего использования. В статье проанализированы подходы к определению понятия "потенциал"; исследованы сущность потенциала предприятия.

The concept of "potential" in broad meaning began to be applied in the late 1970s – early 1980s of the 20th century. For its characteristic the semantic meaning of the word "potentia" is used – force, power. In modern economic and financial dictionaries there is still no unambiguous interpretation of this term. So, in the etymological dictionary of the Russian language marked the origin of the word as borrowed in the 19th century from the French language where "potentiel rated" is taken from the Latin "potentialis", literally "capable of being" [1, p. 316]. In "Economic encyclopedia" it is stated that the capacity is available from the economic entity resources, their optimal structure and ability to efficiently use them to achieve this goal [2, p. 13]. Potential is a polysemantic term used in many fields of knowledge, including Economics. Potential carriers in the economy can be subjects of all types of economic activity, as well as arbitrary groups of such subjects. This is because the potential is neither an existing object, nor the actual results obtained, but the potential of the object. Therefore, potential carriers should be considered not only by their economic activities, but also by hierarchical levels of the economy, within which potential carriers function: mega-carriers of different states; macro-carriers of the state; meso-carriers of regions and industries; micro-carriers of enterprises and population (non-financial and financial corporations, households). In this sense, the most studied in the economic literature carrier of potential at the micro level is the enterprise. Pointing to the importance of potential at the enterprise level, the American scientist I. Ansoff noted that the potential to achieve the goals of the organization in the future is one of the end products of strategic management. In relation to the firm this potential: to "input" – in the financial, commodity and human resources information; and "output" – products and services, experienced from the point of view of potential profitability; from a set of rules of social behavior, the observance of which allows organizations to continually achieve their goals [3, p. 286].

There are several different views on the specification of the substantive basis of the concept of "potential", among which there are several approaches:

1. resource, in which the potential of the enterprise is defined as a set of all available internal resources of the enterprise;
2. target, by which it is identified with the ability, ability or capability of the enterprise to carry out certain activities that would contribute to the achievement of the goal by performing certain tasks;
3. result that considers the potential of the enterprise as all available resources and opportunities used to achieve the goals;
4. system, in which the potential of the enterprise is investigated as a system of certain characteristics, elements that ensure the achievement of the goal. This approach generalizes resource, target and source through their system interpretation. Supporting a systematic approach, it is possible to determine that the potential of the enterprise is a complex, holistic system that includes the available capabilities, abilities and resources that are constantly

interconnected and can be used to implement the strategic, tactical and current goals of the enterprise.

Different theoretical approaches and features of their direction cause a different number of components of the enterprise potential, and, consequently, its structural composition. In the economic literature, various approaches to the structuring of the enterprise potential are considered. Shimko, who distinguishes two common variants of structuring: block-modular, which is based on the interaction of three components that cover all the strategic components of the enterprise, allowing to achieve the goals and most fully characterize the internal state of the enterprise – resources, management system and personnel activities; functional, which has such functional areas: marketing, production, personnel, management, finance, information [4, p. 89].

A. Voronkova in the core of the structure of the potential of the enterprise considers the possibilities. The structure of the potential includes the following opportunities: production and financial (production, financial, communication potentials); intellectual (innovation, marketing, management potentials); labor (labor and motivational potentials). This structure, according to A. Voronkova, reveals the present and future internal potential, however, makes understanding the interaction of enterprise and the environment, and the vision of improving the efficiency of each of the types of potential.

The most detailed structure of the enterprise potential is represented By O. Fedonin, I. Repina and O. Oleksyuk. Scientists used the principle of objective and subjective components of species on the basis of functional characteristics. The use of this classification, as well as the classifications of other scientists, can be considered appropriate and effective in solving the problems of business valuation in financial and investment projects. However, the disadvantages of this structure relate primarily economic activities of the company, because on its basis it is possible to calculate the prospective ways of development of the enterprise and the interaction of components

The most detailed structure of the enterprise potential is presented By I. Repina. The principle of objective and subjective components of species on the functional basis of potential is used. Objective potential is characterized by both material and personal form, that is, it is consumed and reproduced in the process of production and development of the business entity. Objective components of the enterprise potential are a set of innovative, production, financial, investment potential and reproduction potential. Subjective components are associated with the social form of their identification, they include: the potential of the organizational structure of management, scientific and technical, managerial, marketing and logistics potentials. With regard to labor, infrastructure and information potential, they can not be unambiguously attributed to the subjective or objective components.

Structuring of the enterprise potential is variously presented in the economic literature. According to the results of the critical analysis of different approaches to the allocation of

potential components, their division into main and secondary ones is proposed, which allow the primary consideration of the forming components of its potential inherent in any enterprise. The main components are separate components that are in constant relationship with each other and directly affect the overall level of the enterprise potential. Among them are: financial, investment, production, labor, innovation and market potentials. All others are secondary components of the enterprise potential. Given this, the prospects for further research is to assess the investment potential as one of the main components in the overall structure of the enterprise potential.

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PRIORITY TRENDS OF TAX ADMINISTRATION DEVELOPMENT IN ORDER TO INCREASE THE EFFICIENCY OF SERVICING PAYERS

ПРИОРИТЕТНЫЕ ТЕНДЕНЦИИ РАЗВИТИЯ НАЛОГОВОГО АДМИНИСТРИРОВАНИЯ ДЛЯ ПОВЫШЕНИЯ ЭФФЕКТИВНОСТИ ОБСЛУЖИВАНИЯ ПЛАТЕЛЬЩИКОВ

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ABSTRACT

TAX ADMINISTRATION, TAX SYSTEM,
METHODS AND FORMS OF TAX
ADMINISTRATION, THE EFFICIENCY OF
SERVICING PAYERS

The article discusses the impact of forms and methods of tax administration on the efficiency of servicing payers. The importance of control procedures and selection of personnel to improve the quality of service to payers and the formation of an effective and transparent tax system is emphasized. The introduction of automated systems will allow to resist numerous violations of tax laws, actively contributing to the restructuring of society, the development of an innovative economy and improving the quality of life of the population. Priority directions for the development of the tax system of the Republic of Belarus are highlighted.

АННОТАЦИЯ

НАЛОГОВОЕ АДМИНИСТРИРОВАНИЕ, НА-
ЛОГОВАЯ СИСТЕМА, МЕТОДЫ И ФОРМЫ НА-
ЛОГОВОГО АДМИНИСТРИРОВАНИЯ, ЭФФЕК-
ТИВНОСТЬ ОБСЛУЖИВАНИЯ ПЛАТЕЛЬЩИКОВ

В статье рассматриваются вопросы влияния форм и методов налогового администрирования на эффективность обслуживания плательщиков. Подчеркивается важность процедур контроля и подбора кадров для повышения качества обслуживания плательщиков и формирования эффективной и прозрачной налоговой системы. Внедрение автоматизированных систем позволит вести борьбу с многочисленными нарушениями налогового законодательства, активно способствуя реструктуризации общества, развитию инновационной экономики и повышению качества жизни населения. Выделены приоритетные направления развития налоговой системы Республики Беларусь.

The effective functioning of the tax system in most depends on the methods and forms of tax administration. The methods of tax administration include tax planning, tax regulation and tax control. Forms include planning the volume of tax revenues to the budget, preparing programs for a unified financial and tax policy, determining the share distribution of rates and benefits, changing the tax payment deadline, optimizing tax rates, the system of tax benefits, etc.

It is planned to achieve the introduction of an automated mechanism for monitoring the completeness and timeliness of the submission of tax returns (calculations) by payers, including depending on the applicable taxation regime, as well as when changing it, by developing control algorithms and refining information systems. [6]

The tax administration is faced with a paramount task to respond in a timely manner to various changes in tax legal relations in a market economy [1, p.144]. Control of measures for interaction between officials and taxpayers (audio and video control) by tax authorities is needed in order to avoid rudeness, negativity and bias on the part of the official tax authority. In this regard, it is necessary to improve the system of selection and placement of managers and specialists using the personnel reserve. It is necessary to organize the selection of staff for inclusion in the reserve of leading personnel, taking into account the professional, business, personal qualities and age of the candidates, as well as to increase the efficiency of the use of the personnel reserve. It is necessary to increase the professional level of tax service employees who are actively involved in the process of developing and adapting procedures in the field of tax administration. At the moment, the Ministry of Taxes and Dues of the Republic of Belarus plans to introduce new forms and methods of training, including distance learning. At the same time, the issues of conducting trainings for tax officials are being worked out, staff communicative skills are being improved, as well as personal growth and the development of a corporate idea and spirit.

The solution of the above problems is an important and necessary step to achieve the goal of an effective and transparent tax system that ensures tax revenue with maximum respect for the rights and interests of taxpayers. Using the correct tools of tax control, it is possible to create such conditions when it becomes profitable for a taxpayer to pay taxes, conduct business in good faith, and voluntarily interact with tax control and tax administration authorities in general. [1, p.146]

The efficiency of the tax system depends largely on the quality of its management. Today, there are imperfections in the tax system that negatively affects economic development: a decrease in investment activity, massive tax evasion, capital flight, income hiding and the spread of the shadow economy. All of the above problems lead, in turn, to a reduction in tax payments to the budget system of the Republic of Belarus.

To date, it also seems necessary to identify business entities that are inactive. To do this, it is planned to introduce an automated system and determine the procedure for classifying

payers as temporarily inactive, as well as finalizing information systems to automate the process of summarizing information regarding such payers.

The Institute of Tax Administration is understood by us as an integral part of the system of socio-economic regulation with built-in feedback. It is in demand in civil society for continuous monitoring and analysis of the state of socio-economic processes, assessing the effectiveness of economic entities. A really working institute of tax administration, carrying out preventive measures and detecting cases of tax evasion, can make a significant contribution to the fight against corruption, fraud, legalization of criminal money and other violations of the law, thereby actively contributing to the restructuring of society, the development of an innovative economy and improving the quality of population life.

Thus, the priority areas for the development of the tax system in the Republic of Belarus in 2020 are: increasing trust on the part of society in relation to tax authorities; improvement and simplification of the system for filing declarations (including electronic ones), monitoring the timeliness of their filing and completeness of the data provided; training, retraining and advanced training of employees of the Ministry of Taxes and Disputes and its inspections; the organization of the most effective work of the Ministry, as well as the achievement of an increase in the main indicators when working with taxpayers.

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FORMATION OF EXPORT STRATEGY OF ORGANIZATIONS BASED ON INNOVATIVE MARKETING TECHNOLOGIES

ФОРМИРОВАНИЕ ЭКСПОРТНОЙ СТРАТЕГИИ ОРГАНИЗАЦИЙ НА ОСНОВЕ ИННОВАЦИОННЫХ МАРКЕТИНГОВЫХ ТЕХНОЛОГИЙ

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ABSTRACT

EXPORT, INNOVATION, STRATEGY,
MARKETING, LIGHT INDUSTRY

The article considers topical issues of development of export strategies of domestic enterprises. Export is one of the main priorities of development of economy of the Republic of Belarus. Increasing the level of competitiveness of enterprises in modern conditions of the global market can only be achieved through the introduction of innovative marketing technologies. Marketing innovations benefit not only individual companies but also the economy as a whole.

АННОТАЦИЯ

ЭКСПОРТ, ИННОВАЦИИ, СТРАТЕГИЯ,
МАРКЕТИНГ, ЛЕГКАЯ ПРОМЫШЛЕННОСТЬ

В статье рассмотрены актуальные проблемы разработки экспортной стратегии отечественных промышленных предприятий. Экспорт – это один из основных приоритетов развития экономики Республики Беларусь. Повышение уровня конкурентоспособности предприятий в современных условиях глобального рынка может быть обеспечено только за счет внедрения инновационных маркетинговых технологий. Маркетинговые инновации приносят выгоду не только отдельным предприятиям, но и экономике страны в целом.

In the strategy of socio-economic development of the Republic of Belarus, considerable attention is paid to improving the efficiency of the work of Belarusian business entities using modern forms and methods of managing them, strengthening the marketing and innovative orientation of management, which should help domestic enterprises to gain leading positions in the field of quality and competitiveness in the domestic and foreign sales markets.

The importance of exports to market economies is very great. Export, being a powerful

stimulating factor of economic development, plays a role of a kind of «locomotive» in overcoming crisis phenomena, contributes to maintaining production and employment in export-oriented industries, having a positive impact on the economy of the country as a whole.

Thus, the problem of developing an export strategy in domestic industrial enterprises is now extremely urgent at both the macro and micro levels.

At the present stage, the Republic of Belarus faces the most important task - the transition of the economy to an innovative path of development. Its solution is one of the main ways to achieve dynamic development of the country in the long term and increase the standard of living of its people.

Competitive advantages of light industries of the Republic of Belarus are determined by availability of raw material base (flax, chemical fibres and threads, yarns, fabrics, leather and fur raw materials), highly qualified personnel, lower capital intensity of production compared to other industries.

The light industry of the Republic of Belarus has a high degree of export orientation.

In order to increase the surplus, the enterprises of light industry of the Republic of Belarus are aimed at reducing its dependence on imported supplies of raw materials and materials by increasing the production of flax fibre in the country, creating new types of chemical fibres and threads, dyes, leather materials for shoes. In this regard, it is planned to introduce technologies for the production of textile and knitted materials on the basis of new textile raw materials created by enterprises of the chemical industry of the Republic with improved hygienic properties.

The concern «Bellegprom» is an association of organizations and is a multisectoral industrial complex engaged in the production of textile, knitted, garment products, leather goods and footwear, as well as trade, science and education organizations.

The concern «Bellegprom» consists of 97 organizations, including 78 industrial organizations (17 organizations operate in the textile industry, 12 in knitting, 21 in sewing, 28 in leather and footwear). The concern «Bellegprom» is a coalition of organizations and is a diversified industrial complex engaged in production of textile, knitting, garments, manufacturing of leather goods and shoes, also part of the group include the organization of trade, science and education.

In 2018, the export of the concern «Bellegprom» organizations amounted to US \$546 million. The products were shipped to 62 countries around the world. The share of exports in total production in 2018 amounted to 55.3 %. Export growth was observed in countries such as Azerbaijan (174.9 %), Armenia (105.5 %), Kazakhstan (104.5 %), Kyrgyzstan (133.4 %), Tajikistan (132 %), Turkmenistan (142.8 %), Ukraine (112.0 %).

For foreign countries, export growth has increased in the following countries: Belgium (188.8 %), Bulgaria (261.1 %), Brazil (145.4 %), Hungary (177.7 %), Germany (106.4 %), Hong Kong (41.6 times), Georgia (131.6 %), India (139.5 %), Spain (169.7 %), Italy (164.6 %), China

(102.6 %), Latvia (107.1 %), Lithuania (111.2 %), Netherlands (332.2 %), Poland (139.4 %), Romania (197.9 %), United States (121.5 %), Serbia (115.1 %), Slovakia (358.4 %), Turkey (230.9 %), France (158.4 %) [1].

The main export nomenclature is garment, footwear, knitted goods, leather goods, cotton fabrics, linseed, wool, artificial and synthetic, carpets and carpets, linseed and bulk yarns.

In order to promote goods to foreign markets and find potential partners, the concern «Bellegprom» enterprises actively participate in exhibition and fair events. In 2018, the enterprises took part in 109 specialized exhibitions in Belgium, Germany, Italy, India, Latvia, Poland, China, Turkey, France, Finland, Czech Republic, Sweden, Russia, Armenia, Kazakhstan, Uzbekistan.

In terms of world trends, it can be noted that the active development of light industry in developing countries, with significant State support and the availability of its own raw materials, has had an impact on the redistribution of the productive forces of the industry. The production center shifted from Western Europe and the United States to South-East and Central Asia (China, Pakistan, India), South America.

The concern «Bellegprom», along with the expansion of exports, is tasked with providing access to the light industry market.

In addition, there are the following objective reasons restraining the growth of export supplies of group organizations:

- increase in the level of gray demand in the territory of the Eurasian Economic Union, growth in countries where there is an unaccounted (underground) level of production.
- a decrease in purchasing power in the CIS countries, the lack of competitiveness of products by price factor in their markets (due to the influx of cheap goods from Southeast Asia);
- development of light industry in the CIS countries (Turkmenistan, Kyrgyzstan, Uzbekistan).
- high duties on consumer goods in foreign countries;
- decrease in export prices in monetary terms [1].

Despite the fact that enterprises of light industry of the Republic of Belarus have a certain scientific, technical, production and personnel potential in the industry accumulated a number of problems that need to be solved immediately. Competition in the commodity market marked weaknesses of domestic light industry enterprises: slow adaptation to changes in demand, lag in quality of products, design, applied technologies and materials. As a result, domestic goods are being displaced by imported goods: on the one hand, they are high-quality, brand and expensive goods (Germany, Italy, England), and on the other - less high-quality and cheap goods (China, Turkey, Central Asian countries).

In the system of enterprises of light industry the organization of marketing and sales has its own peculiarities - here the success of new products mainly depends on the accuracy of its compliance with the requirements of buyers, that is, market factors of operation of the

enterprise by their importance exceed production and technical.

Therefore, enterprises of the industry should constantly carry out marketing research not only of markets of finished goods, but also of markets of new materials, dyes, technologies, predict trends of fashion development, as well as actively use innovative marketing technologies in their activities.

Thus, the competitiveness of light industry products in fact depends less and less on labor costs and more and more on productivity, quality, design, speed of updating the assortment, distribution, service, marketing and branding.

In 2014-2018, expenditures of enterprises of light industry of the Republic of Belarus on marketing innovations are at a low level and show a high level of variability.

Therefore, more effective promotion of Bellegprom enterprises to new export markets is possible due to:

- use of various methods of marketing communications, information and communication technologies, development of Internet trade, establishment of cooperation with well-known multi-brand online stores;
- organization of work on optimization of activities and improvement of efficiency of operation of the goods network abroad;
- introduction of additional measures to stimulate specialists of marketing and foreign economic services, organization of advanced training of personnel, holding of training seminars;
- increasing the participation of enterprises in tenders and exhibition events held abroad.

Thus, further development of market relations, entrepreneurship, increased participation of Belarusian light industry enterprises in the international division of labor, increased competition in the domestic market create favorable conditions for the use of marketing strategies, and their instruments will increasingly adapt to specific market conditions and specifics of activities of individual domestic enterprises.

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CLOUD TRANSLATION SOFTWARE 2019 REVIEW

ОБЗОР ПРОГРАММНОГО ОБЕСПЕЧЕНИЯ ОБЛАЧНЫХ ТЕХНОЛОГИЙ
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ABSTRACT

CLOUD TRANSLATION PLATFORM,
APPLICATION, PROCESS DOCUMENTS,
LANGUAGES, LOCALIZATION

Cloud Translation platforms are the main tools in the field of computer-aided translation. This paper reviews existing cloud software translation platforms. The article presents translation work process stages, describes the system architecture and workflow of the cloud translation platform. Then focuses on translation platforms of different vendors, post-editing and feedback learning, this paper analyzes the difficulties and key technology of cloud translation, and shows the achievements and commercial application of the cloud translation platforms.

АННОТАЦИЯ

ОБЛАЧНАЯ ПЛАТФОРМА ДЛЯ ПЕРЕВО-
ДА, ПРИЛОЖЕНИЕ, ОБРАБОТКА ДОКУМЕН-
ТОВ, ЯЗЫКИ, ЛОКАЛИЗАЦИЯ

Для автоматизации работы переводчика облачные платформы давно стали основным рабочим инструментом. В данной статье проводится обзор программного обеспечения для автоматизации работы переводчиков, описывается стадии рабочего процесса, архитектура работы системы и собственно процесс облачной платформы. Рассматриваются платформы различных производителей, их возможности, процесс редактирования, описываются плюсы и коммерческое применение облачных платформ.

Cloud Computing is not a novelty any more. Because of this growing technology, we store our personal photos and loads of family videos in the cloud. We communicate and maintain our relations via applications which are in the cloud. Every mobile phone and tablet can run any powerful application today. Nowadays we are provided by services using different cloud platforms. In this paper a review is given for existing cloud platforms. The following paper is about existing cloud platforms which are mainly used for translation to help specialists

complete their work properly and meet deadlines. We will make a review of existing cloud translation platforms.

While translation software previously suffered from limitations in how well it could perform, modern machine learning platforms mean that nuances of language can now be better accounted for, improving accuracy. Although it remains still recommended that for technical documents and other more complicated ones human readers at least proof them, in many instances good translation software should be able to provide a competent solution.

Cloud computing is considered to be the fourth IT industrial revolution after the large computer, personal computer, and the internet. The word “cloud” is a metaphor for network, Internet. Cloud computing platform provides services based “cloud” for developers to create applications. The developers can rely on the cloud platform to create a new Software as a service application.

The translation work process in a cloud platform is generally divided into several steps.

1. Translators conduct a preliminary translation. They get some technical support via the cloud translation platform to improve the quality of the translated material. For instance, the system can give a reference to the previous version of the translation, to avoid duplication of work and to improve the translation efficiency if the similar sentences that have been translated before the project. If the interpreters’ translation does not match the terminology provided by customers the system it will give translators a hint and interpreter’s confirmation about the correctness of the translation, to avoid mistranslation. The translator’s work in a cloud translation platform is stored in the cloud server. Within the project staff, managers can login the translation platform, and easily obtain interpreters’ translated text. In the translation project, experienced supervision of quality control staff interpreters can be arranged among the translation process, detect quality problems in the process of translation, and feedback to the interpreter. So translators can ensure the quality of translated text at minimum cost to correct quality problems under the online quality control personnel supervision.

2. The reviewers carry on the editing work. Second- Person Review is a common recognition in the translation industry. Reviewers also work on the cloud translation platform, as well as the translators to obtain the system's technical support. In addition, if reviewers modify a sentence, then all similar sentences in the project will be automatically corrected. The cloud system may automatically distinguish the script text edited by the reviewers through different color discrimination, and refer automatically to interpreters.

3. To revise the translation according to customer’s feedback. In all cloud translation projects, the project results will be submitted to the customers after the reviewing work is completed, but it does not mean the end of the project. Usually the customers evaluate the translation and give revised opinions based on their quality goals and quality expectations. The translators modify the translated texts as far as possible according to the customers’ requirements. In this stage, interpreters do the revision work on the platform, at the same

time new terms are added to the terminology storehouse. The translation accepted by the customers will be added to the translation memory, namely if the translators in the future work fall through the same or similar sentences, the system will choose the translated texts accepted by the customers for the interpreters.

There are a dozen of translation platforms. We will review hereunder the most popular ones, those helping translation teams to do their work properly:

Focusing on straight translations, Pairaphrase proposes technology which translates 57 different languages. The platform's secure file translator tool enables to upload, translate and process 24 different file types at a time, including PowerPoint, AutoCAD, Excel, InDesign, and scanned documents. It is available to work directly in Microsoft Word and other Microsoft Office products. There is also the voice-over translation, enabling users to upload a script file and receive the translated version as an MP3 or WAV file in 18 different languages. Pairaphrase also includes real-time collaboration tools that allow teams to work together no matter where they are.

Text United has designed a cloud-based platform for all translation and localization needs. Bringing together outsourced and in-house professional translators, it provides a multi environment for teams to work together on projects while monitoring and editing translations throughout. These range from simple text translations for websites to complex software localizations. Adding to the convenience is integration with third-party platforms such as Dropbox, Github, Bitbucket, SharePoint and Outlook. This also includes features such as an overlay editor, translation memory, terminology management, machine translation and multilingual SEO support.

Focusing on service localization, Phrase enables organizations to collaborate with translators in a simple and transparent manner. The platform is powered by API-driven software that extracts language data from source code and makes it available for localization through an online editor. Users operate their projects from a dashboard that offers a real-time status of the whole translating process at a glance. You can keep track of new tasks, missing translations and texts that require proofreading with just a few clicks. When you're away from the dashboard, Phrase allows you to receive updates on translations and comments via email, in-app notifications or through integrated messengers. It contains a useful search function that identifies all text resources containing a certain word for a quick fix in multiple areas, while proof reading features enable other translators on the platform to verify text if required.

Geoworkz has been pitching its software at freelancers, agencies and enterprises, with a range of tools that support large-scale translations and localization projects. Its features include a live assets tool which provides live updates to all translations, glossaries and review packages. It also offers project management tools like asset aliasing, which controls individual or group access to all live assets, thus protecting customer security. The software comes kitted out with numerous collaboration tools, including its live, online interface which allows users to

review and comment on projects. Despite the solid range of features, the Geoworkz software feels a little old fashioned compared to previous mentioned.

To conclude we cannot but mention, that the cloud translation has greatly improved the efficiency of translation industry making it possible to shorten the time on processing large amounts of texts. The domestic research of computer aided translation based on cloud computing platform is still in its initial stage. Although the technology of electronic dictionary based on cloud platform has gradually matured, there is no comprehensive and in-depth study on the auxiliary translation generation and systematic feedback learning strategy. And the online translation system based on mobile phone platform, which is combined with mobile cloud computing related technologies, is still in an embryonic stage. Although the cloud translation system has moved towards large-scale real application, but some core technology still needs to be further studied and explored.

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UDC 345

CRIMINAL LIABILITY FOR EVASION FROM REPAYMENT OF ACCOUNTS PAYABLE

УГОЛОВНАЯ ОТВЕТСТВЕННОСТЬ ЗА УКЛОНЕНИЕ ОТ ПОГАШЕНИЯ КРЕДИТОРСКОЙ ЗАДОЛЖЕННОСТИ

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ABSTRACT

CRIMINAL LIABILITY, ADMINISTRATIVE LIABILITY, EVASION FROM REPAYMENT OF ACCOUNTS PAYABLE

Today difficult conditions of implementation of business activity were reflected also in settlement legal relations of subjects of managing. Situations related to late payment or debt forcing business leaders to apply to the Economic court in order to recover from contractors debt forcibly. At the same time, despite the issuance by the Economic court of judicial decisions on debt collection, the debtor does not always fulfill the obligations stipulated in the contract, and often deliberately, being able to fulfill them, evades the repayment of accounts payable, which entails a violation of the legislation of the Republic of Belarus. This article deals with the following: criminal liability for evasion of accounts payable; administrative liability for offenses in the economic sphere.

АННОТАЦИЯ

УГОЛОВНАЯ ОТВЕТСТВЕННОСТЬ, АДМИНИСТРАТИВНАЯ ОТВЕТСТВЕННОСТЬ, УКЛОНЕНИЕ ОТ ПОГАШЕНИЯ КРЕДИТОРСКОЙ ЗАДОЛЖЕННОСТИ

Сегодня сложные условия осуществления предпринимательской деятельности отразились и на урегулировании правоотношений субъектов хозяйствования. Ситуации, связанные с несвоевременной оплатой или задолженностью, вынуждают руководителей предприятий обращаться в Экономический суд для принудительного взыскания задолженности с контрагентов. В то же время, несмотря на вынесение Экономическим судом судебных решений о взыскании задолженности, должник не всегда выполняет обязательства, предусмотренные в договоре, и зачастую намеренно, будучи в состоянии их выполнить, уклоняется от погашения кредиторской задолженности, что влечет за собой нарушение законодательства Республики Беларусь. В данной статье рассматриваются следующие

вопросы: уголовная ответственность за уклонение от кредиторской задолженности; административная ответственность за правонарушения в сфере экономики.

Currently, there is a practice of default by the debtor of its obligations to comply with the terms of contracts. The fact is that the predominant form of evasion of a person from fulfilling the terms of the contract was the introduction of the creditor to mislead about the actual capabilities of the obligated person to repay the debt in the amounts and terms stipulated by the contract. According to the Civil Code of the Republic of Belarus (hereinafter – the civil code), article 295 provides for the terms of performance of obligations [3].

Article 242 of the Criminal code of the Republic of Belarus (hereinafter – the criminal code) provides for liability for failure of an individual entrepreneur or an official of a legal entity to repay large amounts of accounts payable under a court order that has entered into legal force, if it is possible to fulfil the obligation. Therefore, for Commission of this crime sanctions in the form of a penalty, or deprivation of the right to hold certain positions or to be engaged in certain activity, or restriction of freedom for a period of up to two years, or imprisonment for the same term will be applied [1].

The essence of evasion from repayment of accounts payable on a large scale is manifested in the active inhibition of enforcement proceedings aimed at collecting accounts payable. The crime is committed by omission, but such omission consists in the active abstention of the debtor from binding his actions, taking an unconstructive position in relation to the fulfillment of his obligations. In this case, the debtor imitates his difficult financial situation, does not act to fulfill the obligations imposed on him by the court decision that entered into force. The debtor deliberately does not comply with the court decision on repayment of accounts payable and can actually prevent the occurrence of criminal consequences [5].

In order to bring a person to criminal liability under article 242 of the criminal code, the following conditions must be met simultaneously:

1. The presence of accounts payable. As a rule, the debt is formed in case of non-payment of the delivered goods, rendered services in time specified in the contract. However, there may also be a transfer of funds to the account of the performance of obligations in the future and which has not been performed within the period specified in the contract.
2. Large amount of debt. A large debt is considered to be 250 or more times the amount of the basic amount on the day of the Commission of the crime.
3. The presence of an effective court order. It can be a decision, a ruling on a court order, which are subject to execution.
4. The availability of opportunities fulfill judicial the resolution. This condition is determined

by the availability of funds that are or were in the accounts of the enterprise at the time of the crime.

5. Intentional action of an official. An official (Director, Manager, acting Director, etc.) or an individual entrepreneur must be aware that his enterprise has a debt (that is, these persons knew about the presence of a court order), there is an objective opportunity to repay it and he does not want to do this.

6. The period elapsed from the date of default. Since this act belongs to the category of crimes that do not pose a great public danger, from the date of Commission of the crime and before the entry into force of the sentence should take no more than two years [4].

However, if the actions of the individual entrepreneur or official person of the legal person provides for evasion of payment on an enforceable court order accounts payable subject to availability to fulfil the obligation is subject to administrative liability under article 11.18 of the code of administrative offences (Hereinafter Cao) of the Republic of Belarus, which entails a warning or imposition of a fine from six to twenty basic units, or administrative arrest [2].

However, the dispositions of article 11.18 of the administrative Code and 242 of the criminal code differ only in the size of outstanding accounts payable, so article 242 of the criminal code has a greater public danger than the corresponding administrative offense.

Thus, increasing the effectiveness of criminal and legal measures to combat economic crimes today is the Central task of criminal policy in the face of extremely unfavorable changes in quantitative and qualitative indicators of crime [5]. It is these prerequisites suggest the need for a scientifically sound understanding of the mechanism of this struggle. The problem of creating an effective mechanism to ensure the implementation of the law in modern conditions is of great importance. However, the achievement of this goal requires to intensify the implementation of the system of measures of criminal and legal impact on economic crime.

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UDC 332.1

THE ROLE OF AGRICULTURE IN THE DEVELOPMENT OF THE GEORGIAN ECONOMY

РОЛЬ СЕЛЬСКОГО ХОЗЯЙСТВА В РАЗВИТИИ ЭКОНОМИКИ ГРУЗИИ

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ABSTRACT

AGRICULTURE, PRODUCTIVITY,
AGRICULTURAL SERVICES, ORGANIC
AGRICULTURAL FOOD SECTOR, EXPORTS

The article analyzes the structure of agriculture, considers the main agricultural products, agricultural services, organic agricultural food sector; assesses export products and markets. The role and importance of agriculture for the development of the Georgian economy is substantiated.

АННОТАЦИЯ

СЕЛЬСКОЕ ХОЗЯЙСТВО, ПРОИЗВОДИТЕЛЬНОСТЬ, СЕЛЬСКОХОЗЯЙСТВЕННЫЕ УСЛУГИ, ОРГАНИЧЕСКИЙ АГРОПРОДОВОЛЬСТВЕННЫЙ СЕКТОР, ЭКСПОРТ

В статье проанализирована структура сельского хозяйства, рассмотрены основные сельскохозяйственные продукты, сельскохозяйственные услуги, органический агропродовольственный сектор; проведена оценка экспортных продуктов и рынков. Обоснована роль и значение сельского хозяйства для развития экономики Грузии.

In 2018, the agricultural production of Georgia was \$1 billion, which accounted for about 6.7 % of the country's GDP. The role of agriculture in employment is significant with 42.9 % of labor force. Rural area in Georgia is home for almost 41.4 % of total population. Contribution of agriculture to foreign trade is notable for agriculture exports accounting for 29.3 %, and the import constituting 15 % of the total.

In Georgia, most of the arable crop land and perennial land is privately owned. Georgian agriculture is characterized by a large number of small size private farmers or, it would be more accurate to say, rural households involved in farming activities. Land structure is very fragmented. There are smallholders with an average of 1.3 ha agricultural land.

Key agricultural products. As of 2018, 45 % and 50 % of agricultural output was from plant growing and animal husbandry sectors, respectively. Agricultural services comprise 5 % of

total agricultural output.

Plant production includes, particularly:

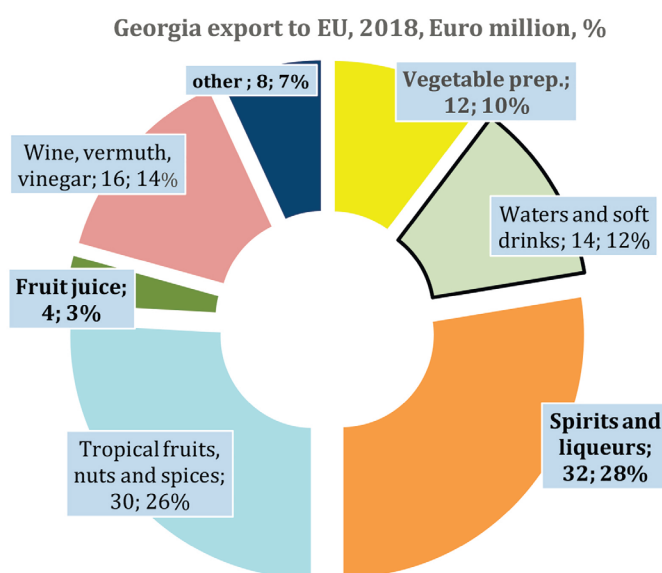
- vegetables (cucumbers, tomato, onions, garlic, pepper);
- fruits (apples, cherries, plums, peaches, pears);
- grapes (mostly for wine);
- melons;
- citrus fruits;
- cereals (wheat, barley, corn);
- potatoes.

Animal husbandry includes, in particular, cattle breeding; sheep breeding; milk and dairy production; poultry.

Key exported products include: wine of fresh grapes, cigars, cigarillos, waters, natural or artificial, alcohol < 80 % vol., other nuts, fresh or dried.

The main export market for Georgian agricultural food products is the Russian market, which contributes for the lion's share of export of alcohol, and mineral waters. In 2018, around 25 % of total agricultural food exports from Georgia were destined to Russia.

Other key agricultural food markets are the markets of the EU and Ukraine. Total agricultural food export from Georgia was \$ 960 billion, of which over \$130 million was shipped to the EU market (Fig. 1) [1].



Source: estimated by the author

Figure 1 – Georgia export to EU, 2018, million euros, %

Georgian organic agricultural food sector involves over 100 business entities, mostly focused on wine, tea and nuts. Among registered organic operators in Georgia, there are three livestock and dairy producers, and two dozens of beekeepers that are yet listed as conventional. Key organic products - wine, tea, hazelnuts, wild plants, berries and fruits, rose oil, honey.

A large share of wine and other alcoholic drinks produced in Georgia is exported to the EU market (together accounting for around 30% of agricultural food export to the EU). Other key exports to the EU include tropical fruits (with 26 % share), mineral waters and soft drinks, and vegetable preparations. Main exports from Georgia to the EaP

market is wine, and other alcohol beverages, waters and soft drinks, tropical fruits (citrus). The largest export markets among EaP countries are Russia and Ukraine. There are around 180 wine producers in Georgia, of which 100 were engaged in export. About a dozen of wineries produce in the range of 100,000-1,000,000 bottles of wine per year. The wine growing sector is fragmented.

Georgia signed an Association Agreement with the EU in 2014, which became effective in July 2016. EU-Georgia trade relations are determined by the free trade area set up by the DCFTA part of the Association Agreement. The DCFTA sets up a free-trade area between the EU and Georgia in line with the principles of the World Trade Organization. The DCFTA allows for the following:

- removal of import duties for most goods traded between the EU and Georgia;
- provision for broad mutual access to trade in services for both partners;
- both EU and Georgian companies can create a subsidiary or a branch office on a non-discriminatory basis. This means they undergo the same procedures as domestic companies in the partner's market when setting up a business.

Overall, the EU is Georgia's main trade partner. Around 27 % of its trade is with the EU, followed by Turkey (13.6 %), and Russia (11 %). There is scarcity of land resources, and, at the same time low utilization of those scarce resources. Agricultural land is about 2.4 million ha, which also includes pastures and meadows, and forest area is over 2.8 million ha.

Despite the reduction of water withdrawal throughout many years, Georgia still remains a water-stressed country, with water stress level of 56.4 %. The largest share of water withdrawal is attributed to agriculture. Agricultural water withdrawal (including agriculture, aquaculture and forestry) comprises around 72.54 percent of total water withdrawal in the country, including losses [2]. Due to various inefficiencies in the irrigation infrastructure as well as in the management of the irrigation water, water losses in the irrigation system were significant.

Agricultural machinery and equipment has been improved through a government supporting program. However, there are inefficiencies in managing and utilization of agricultural machines and equipment. There is also low use of protection equipment and technologies against natural disasters such as heavy rain, hail, and frost.

Insufficient use of advanced technologies, and techniques and means of production leads to low productivity and low quality, and, thus, low competitiveness of agricultural products. Most of the productivity indicators of animal husbandry, crop farming and horticulture are well below those of the EU average. Insufficient use of advanced techniques and means of production is due to the lack of knowledge about effective farming and marketing practices among farmers, and low level of investments in agricultural production and marketing.

Thus, agricultural and food production may suffer from inefficiencies in the agricultural production and in markets. Low level of mechanization of agriculture as well as limited use of modern technologies and practices result in low labor productivity and low incomes of

farmers, which leads to limited opportunities to ensure a satisfactory quality of life through the farming and high levels of poverty.

The prevalence of fragmented smallholders in agriculture, who more often than not are non-professional and non-commercial, creates additional logistical complexities, increases the transportation costs and, thus, the overall cost of production. Small farmers have a weak bargaining power in the market and are highly dependent on market prices dictated by medium and large processors. Primary producer-processor relationships are usually not contract-based, due to which farmers often face problems related to collection of payment for milk from middlemen or processors. This latter issue is a very acute factor that negatively affects the functioning of the milk market today.

The ineffective price formation process in agricultural markets leads to a distorted quality-price relationship, which discourages farmers from improving the quality (as well as processors from seeking high quality primary products and producing high quality products). As a result, food products are often of low quality and are thus priced below the market reducing competitiveness of processors and their margins.

In terms of gender involvement, it is important to note that a large proportion of the female workforce is employed in agriculture, while only every third male person being in this sector. The misplacement of skill and lower rate of representation is likely to hit the sub-segment of the market by more women being engaged in small scale farming, so when devising programs, it is important to factor the gender dimension as it has implications on the choice of activities that would lead to positive change.

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UDC 378

REASONS TO LEARN LANGUAGES

ПОЧЕМУ ВАЖНО УЧИТЬ ЯЗЫКИ

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ABSTRACT

NATIVE LANGUAGE, FOREIGN LANGUAGE,
COMMUNICATION, CHANNEL, ENVIRONMENT,
LANGUAGE DIVERSITY, WORLDVIEW

The paper discusses importance of learning foreign languages for several reasons. The author focuses on language diversity and necessity to communicate culture through language as a code system. Native speakers with their own worldviews can be understood only through expressing their thoughts by means of native language.

АННОТАЦИЯ

РОДНОЙ ЯЗЫК, ИНОСТРАННЫЙ ЯЗЫК, ОБЩЕНИЕ, ТРАНСЛИРОВАТЬ, СРЕДА ОБЩЕНИЯ, ЯЗЫКОВОЕ МНОГООБРАЗИЕ, КАРТИНА МИРА

В статье рассмотрены некоторые причины необходимости изучать иностранные языки. Уделено внимание языковому многообразию и передаче культурных явлений посредством языка как кодифицированной системы. Рассмотрен процесс формирования картины мира и её передача средствами родного языка.

Being able to communicate in other languages is not just important for work, it also offers many more opportunities than if we were monolingual. Languages help us make friends across the globe and learn about other countries and cultures. Foreign travel becomes more rewarding and we are able to experience things that would otherwise not be possible.

Given that languages are a highly valued skill, it is worrying that we lag far behind Europe when it comes to learning languages in school. We need to acknowledge our lack of foreign language skills and start promoting language study in schools as soon as possible. We must give young people the opportunities they need to compete in a global jobs market – fluency in a foreign language should be another asset our school leavers and graduates are able to boast.

English is on its way to becoming the world's universal language, for better or for worse. Let's face it, it's the language of the internet, it's the language of finance, it's the language of air traffic control, of popular music, diplomacy – English is everywhere.

Now, Mandarin Chinese is spoken by more people, but more Chinese people are learning

English than English speakers are learning Chinese. Recently, there are two dozen universities in China teaching all in English. English is taking over.

And in addition to that, it's been predicted that at the end of the century almost all of the languages that exist now – there are about 6,000 – will no longer be spoken. There will only be some hundreds left. And on top of that, it's at the point where instant translation of live speech is not only possible, but it gets better every year.

The reason of reciting those things is that we're getting to the point where a question is going to start being asked, which is: Why should we learn foreign languages – other than if English happens to be foreign to one? Why bother to learn another one when it's getting to the point where almost everybody in the world will be able to communicate in one?

There might be a lot of reasons, but first let's address the one that is most likely to have been heard of, because actually it's more dangerous than it seems to be. And that is the idea that a language channels our thoughts, that the vocabulary and the grammar of different languages give everybody a different kind of acid trip, so to speak. That is a marvelously enticing idea, but it's kind of fraught.

So it's not that it's untrue completely. So for example, in French and Spanish the word for table is, for some reason, marked as feminine. So, "la table," "la mesa," a speaker just has to deal with it. It has been shown that if you are a speaker of one of those languages and you happen to be asked how you would imagine a table talking, then much more often than could possibly be an accident, a French or a Spanish speaker says that the table would talk with a high and feminine voice. So if you're French or Spanish, to you, a table is kind of a girl, as opposed to if you are an English speaker.

It's hard not to love data like that, and many people will say that that means that there's a worldview that they have if they speak one of those languages. But we have to watch out, because imagine if somebody put us under the microscope, the us being those of us who speak English natively. What is the worldview from English?

So for example, let's take an English speaker. Her Majesty the Queen. She speaks English. Of course, she has a worldview. Now, that is Donald Trump. In his way, he speaks English as well.

And here is Mrs. Michelle Obama, and she is an English speaker, too. So here are three speakers of the English language. What worldview do those three people have in common? What worldview is shaped through the English language that unites them? It's a highly fraught concept. And so gradual consensus is becoming that language can shape thought, but it tends to be in rather darling, obscure psychological flutters. It's not a matter of giving you a different pair of glasses on the world.

Now, if that's the case, then why learn languages? If it isn't going to change the way we think, what would the other reasons be? There are some. One of them is that if we want to imbibe a culture, if we want to drink it in, if we want to become part of it, then whether

or not the language channels the culture – and that seems doubtful – if we want to imbibe the culture, we have to control to some degree the language that the culture happens to be conducted in. There's no other way.

There's an interesting illustration of this. I have to go slightly obscure, but really you should seek it out. People are vibrant, funny, passionate, and interesting while speaking their native languages. Once they happen to be in English-speaking environment. Now, they speak English but it's not their native language, they'd rather not speak English. And they speak it more slowly, they have accents, they're not idiomatic. Suddenly these lively people become husks of themselves, they're shadows of themselves.

To go into a culture and to only ever process people through that kind of scrim curtain is to never truly get the culture. And so to the extent that hundreds of languages will be left, one reason to learn them is because they are tickets to being able to participate in the culture of the people who speak them, just by virtue of the fact that it is their code. So that's one reason.

Second reason: it's been shown that if you speak two languages, dementia is less likely to set in, and that you are probably a better multitasker. And these are factors that set in early, and so that ought to give you some sense of when to give junior or juniorette lessons in another language. Bilingualism is healthy.

And then, third – languages are just an awful lot of fun. Much more fun than we're often told. Or languages have different word orders. Learning how to speak with different word order is like driving on the different side of a street if you go to certain country, or the feeling that you get when you put Witch Hazel around your eyes and you feel the tingle. A language can do that to you.

So for example, "The Cat in the Hat Comes Back," a book that we all often return to, like "Moby Dick." One phrase in it is, "Do you know where I found him? Do you know where he was? He was eating cake in the tub, Yes he was!" Fine. Now, if you learn that in Mandarin Chinese, then you have to master, "You can know, I did where him find? He was tub inside gorging cake, No mistake gorging chewing!" That just feels good. Imagine being able to do that for years and years at a time.

Or, have you ever learned any Cambodian? If someone did, they would get to roll around in their mouth not some baker's dozen of vowels like English has, but a good 30 different vowels scooching and oozing around in the Cambodian mouth like bees in a hive. That is what a language can get us.

And more to the point, we live in an era when it's never been easier to teach yourself another language. It used to be that you had to go to a classroom, and there would be some diligent teacher – some genius teacher in there – but that person was only in there at certain times and you had to go then, and then was not most times. You had to go to class. If you didn't have that, you had something called a record. There was only so much data on a record, or a cassette, or even that antique object known as a CD. Other than that you had books that

didn't work, that's just the way it was.

Today sings are much better and easier. People can teach themselves any language that they want to with wonderful sets such as Rosetta Stone, Glossika, Doulingo, Linguae, etc. We can do it any time, therefore we can do it more and better. Couldn't have done it 20 years ago when the idea of having any language you wanted in your pocket, coming from your phone, would have sounded like science fiction to very sophisticated people.

So, it's highly recommend that we teach ourselves languages other than the one that we're speaking as native speakers, because there's never been a better time to do it. It's an awful lot of fun. It won't change our mind, but it will most certainly blow our mind.

UDC 336.2; JEL Classification: H20

INNOVATIVE ECONOMICS: TRENDS IN THE DEVELOPMENT OF INTERNET SERVICES IN THE CONTEXT OF TAX ADMINISTRATION

ИННОВАЦИОННАЯ ЭКОНОМИКА: ТЕНДЕНЦИИ РАЗВИТИЯ ИНТЕРНЕТ-УСЛУГ В КОНТЕКСТЕ НАЛОГОВОГО АДМИНИСТРИРОВАНИЯ

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ABSTRACT

TAX ADMINISTRATION, TAX AUTHORITIES,
TAX ELECTRONIC SERVICES, ELECTRONIC
DECLARATION SYSTEM

The article discusses trends of the electronic tax services development, including an increase in the number of users of electronic services, the expansion of electronic services, a reduction in tax risks, and a reduction in the burden on tax authorities and payers. According to the author, the tax service should be transformed from a fiscal body into a service company focused on satisfying the interests of taxpayers. A service-oriented model of tax administration can be used for this purpose, suggesting the further development of electronic interaction between tax authorities and taxpayers.

АННОТАЦИЯ

НАЛОГОВОЕ АДМИНИСТРИРОВАНИЕ, НАЛОГОВЫЕ ОРГАНЫ, ЭЛЕКТРОННЫЕ НАЛОГОВЫЕ УСЛУГИ, СИСТЕМА ЭЛЕКТРОННОГО ДЕКЛАРИРОВАНИЯ

В статье рассматриваются тенденции развития электронного налогового обслуживания, среди которых рост числа пользователей электронными услугами, расширение электронных сервисов, снижение налоговых рисков, сокращение нагрузки на налоговые органы и плательщиков. По мнению автора, налоговая служба должна быть преобразована из фискального органа в сервисную компанию, ориентированную на удовлетворение интересов налогоплательщиков. Для этого может быть использована сервис-ориентированная модель налогового администрирования, предполагающая дальнейшее развитие электронного взаимодействия между налоговыми органами и налогоплательщиками.

The development of electronic services has become one of the main factors contributing to improving the quality of tax administration. An improved model of taxation of business entities based on remote servicing of taxpayers allows you to continuously monitor the tax risks of the subject of taxation.

Expanding the range of tax information services contributes to an increase in the share of taxes paid voluntarily, which simplifies control over tax revenues and reduces administrative costs.

The most dynamically developing system of fiscal authorities is the electronic declaration system (EDMS), the number of users is growing from year to year. As of January 1, 2011, the subscribers of the electronic declaration system were almost 17 thousand payers (in Minsk), then as of January 1, 2016, 88.7 thousand business entities were connected to the EDMS (41.5 thousand organizations and more than 47 thousand individual entrepreneurs), or 74.4 % of the total number of payers registered in tax inspections of Minsk. Thus, over 5 years the number of subscribers to this system has increased 5.2 times.

Since 2014, it has been possible to use the new Personal Account functionality in the request mode to receive information promptly about overpaid payments to the budget, offsets made, to make an appointment with the management, and learn about the results of performing administrative procedures on submitted applications. Today, more than 100 thousand legal entities, 120 thousand individual entrepreneurs and over 31 thousand individuals use the capabilities of the "Personal Payer Account". In total, interaction with tax authorities in electronic form is carried out by more than 285 thousand organizations and individual entrepreneurs, or about 82 % of the total number of business entities that are registered with the tax authorities. The possibility of filling out 6 types of declarations on the Ministry of Taxes and Levies portal, submitting applications for offsetting (returns) excessively paid taxes, payment of taxes using Internet banking is already realized.

At the moment, a tax calculator has been introduced to select the taxation regime for small enterprises and individual entrepreneurs. Improving the work of tax authorities is aimed at creating favorable conditions for taxpayers to pay taxes and at minimizing their contact with tax authorities. The Ministry of Taxes and Levies calls for more active involvement in the electronic declaration system and evaluate its benefits.

The tax service should be transformed from a fiscal body into a service company focused on satisfying the interests of taxpayers. The expected results from such a transformation should be an expansion of the range of services provided by tax authorities to taxpayers, an improvement in informing taxpayers on tax legislation issues and, as a result, an increase in the share of taxpayers who satisfactorily assess the quality of tax administration. To date, the website of the Ministry of Taxes and Levies provides 20 Internet services.

The formation of a service-oriented administration model involves the development of electronic interaction between tax authorities and taxpayers with the goal of almost eliminating

face-to-face interaction between the tax authority and the taxpayer and the transition to remote communication. For the convenience of payers, the Ministry of Taxes of the Republic of Belarus is actively introducing new electronic services.

It is necessary to give the taxpayer the opportunity to see online all the information on his relations with the budget on the computer's screen and to carry out all kinds of interactions with the tax authorities in electronic form: registration, reconciliation of the status of settlements with the budget, offsetting or refunding of overpaid amounts, clarification of outstanding payments, sending and receiving documents, etc.

The ultimate goal of reforming the tax system should be to reduce the burden on both tax services and business entities. The reverse side of the reform may be a significant reduction in the tax burden in the country, that at the initial stage will lead to a decrease in the amount of tax collection from business entities, but in the future, with an increase in the number of entities themselves, the amount of tax payments will reach the desired level and the budget fullness will increase.

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COMPARATIVE ANALYSIS OF SOFTWARE TO CREATE INTERACTIVE APPLICATIONS СРАВНИТЕЛЬНЫЙ АНАЛИЗ ПРОГРАММНОГО ОБЕСПЕЧЕНИЯ ДЛЯ СОЗДАНИЯ ИНТЕРАКТИВНЫХ ПРИЛОЖЕНИЙ

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ABSTRACT

ИНТЕРАКТИВНОЕ ПРИЛОЖЕНИЕ, ПРИЛОЖЕНИЕ, РАЗРАБОТКА ПРИЛОЖЕНИЙ, ПРОГРАММА, КОНСТРУКТОР

The article discusses the development of interactive applications and its topicality in terms of world trends. Comparative analysis of software for application development is done. Specific features and advantages of compared programs are outlined as well as their functionality, developments fields and conditions.

АННОТАЦИЯ

INTERACTIVE APPLICATION, APPLICATION DEVELOPMENT, SOFTWARE, CONSTRUCTOR

В статье рассмотрена актуальность разработки интерактивных приложений в контексте мировых тенденций. Проведен сравнительный анализ программ для разработки интерактивных приложений, выделены особенности и преимущества сравниваемых программ, их возможности, сферы разработки и условия пользования.

At present times people do everything in order to achieve maximum comfort and convenience in their life. For this purpose, today experts in the field of information technology are developing a variety of applications that allow to solve a huge number of problems in different areas of human activity [4]. However, as practice shows, specialized software is in great demand today. Also, it is such programs that can make their developers good money, because nowadays companies invest in products that could to some extent optimize or simplify existing business processes. In recent years, the need for specialists in the field of information technology has increased. Such dynamics allows to draw a conclusion that development of applications, in particular interactive, is actual and expedient.

Development of interactive applications requires appropriate programs or constructors, the choice of which is one of the most important stages of application development. The following programs take part in the comparative analysis: ConstructApp-application designer;

CalcCreator – the first calculator designer in the CIS [1]; uCalc-universal calculator and form designer [6]; CalcBuilder – a software product, a tool for rapid application development, an integrated programming environment, a system used by programmers to develop software in the C++ programming language [5] and MS Excel.

The main technical characteristics of the compared design programs, except MS Excel, are presented in Table 1.

Table 1 – Main technical characteristics of the compared programs

	ConstructApp	CalcCreator	uCalc	CalcBuilder
Price	no	795 RUB per month	from \$3 per month	19.50€
The free version	completely free	with limited features	with limited features	there is a trial period
Installation method	HTML, by reference	HTML, by reference	HTML, by reference or extension	extension
Visual editor	+	+	+	-
HTML / CSS editor	–	+	+	+
Ready template	+	+	+	–
Your color scheme	–	–	+	-
Adaptivity	-	+	+	-
The animation in the calculation	-	-	+	+
Multi-page form	-	–	–	+
Attaching files	+	+	+	+
Mathematical operations with form fields	+	+	+	+
Branching (conditional operators)	+	+	+	+

Source: [3]

ConstructApp is completely free. The designer has a visual editor and calculator templates. It's not the easiest interface, but understandable. ConstructApp does not have the ability to accept payment and send email notifications. The service is perfect for creating entertaining

or informative calculators. Without collecting contacts, connecting Analytics and any tools hinting at a commercial component [3].

The advantages of CalcCreator are the following:

1. Cheapness. Order the creation of online-calculator to calculate the cost is a lot of money. Not everyone can afford it. As a result, there is a loss of customers. Now calculators are available for any business;

2. Speed. Creating a regular calculator takes time. To change or improve it, you will need to contact a specialist again. With this service a minimum of time is spent and the result is obtained immediately;

3. Convenience. The service allows you to create calculators of any complexity and adapt them for business and target audience. Using the "Subscription Form" option, maximum information about the client is collected. There are wide possibilities in the choice of styles and design [1].

Ucalc benefits:

1. Speed. Dozens of templates for different business areas and ready-made blocks for self-assembly;

2. Convenience. Slider, list, checkboxes, collecting contacts and receiving payments-all at hand in the visual editor;

3. Efficiency. Increase SEO performance of the site, ready-made applications for mail and phone, ability to send messages to customers;

4. Benefit. No need to contact the developers to customize, install or update the form;

5. Practicality. The ability to use on the site, as the VK application, in any messenger, social networks and mail – widget for 5 occasions [6].

The CalcBuilder costs 19.50 €. For this money it is a powerful enough tool to create calculators. Immediately a little repels the fact that the designer does not have ready-made templates calculators, visual editor. In addition, over adaptability, too, they will have to work on their own. CalcBuilder is more suitable for experienced webmasters who are not afraid to write a calculation formula in PHP and connect targets through JavaScript event handlers. Among the advantages designers should note integration with Mailchimp and import calculator from Excel [3].

The main advantage of the Office Excel program is the presence of a huge number of built-in standard functions, which allows to easily and quickly apply various calculations. A built-in function is a formula that has been prepared in advance. Before writing it, it is necessary to enter the sign "=". Excel provides several categories of functions, which greatly simplifies the work. Mathematical and trigonometric functions are used in the processing of matrices and solution of various problems. Logical functions are suitable for solving problems with certain conditions.

Working with tabular data can be greatly simplified by using statistical functions. They allow

to carry out economic research and statistical calculations. Financial, textual, engineering and information functions occupy a special place among the categories. It is also possible to process all data in time and date format.

Excel developers have made sure that the use of functions does not cause any difficulties for users. The function wizard was created for this purpose. It helps to enter formulas correctly and maintain the sequence of data entry. Using such a service helps to quickly apply standard features. The user can display the data right after entering a formula onto a worksheet by creating a graph or chart.

It is also worth mentioning the possibility of autocomplete, which works when using any function from the list. It should be borne in mind that due to the specific type of addressing, the arguments of functions may change. In practice, autocomplete function works very simply [2].

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INTERACTIVE APP «DEPOSIT CALCULATOR» AS A METHOD FOR DETERMINING INCOME FROM OPENING A DEPOSIT

ИНТЕРАКТИВНОЕ ПРИЛОЖЕНИЕ «ДЕПОЗИТНЫЙ КАЛЬКУЛЯТОР» КАК СПОСОБ ОПРЕДЕЛЕНИЯ ДОХОДА ОТ ОТКРЫТИЯ ВКЛАДА

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ABSTRACT

*BANK DEPOSIT, INTEREST, DEPOSITOR,
MONETARY FUNDS, DEPOSIT CALCULATOR*

The article defines the term "deposit" and its meaning, outlines the advantages of opening the deposit for both parties – a depositor and a bank – and specifies the features of storing money in deposit. Comparative analysis of simple interest and compound interest is done. Topicality, functionality, and advantages of the deposit calculator are determined as well as the input data for its use.

АННОТАЦИЯ

БАНКОВСКИЙ ДЕПОЗИТ, ВКЛАД, ПРОЦЕНТ, ВКЛАДЧИК, БАНК, ДЕНЕЖНЫЕ СРЕДСТВА, ДЕПОЗИТНЫЙ КАЛЬКУЛЯТОР

В статье рассмотрено понятие «депозит»: дано научное определение этого понятия, его сущность, преимущества открытия депозита для обеих сторон – вкладчика и банка, а также особенности хранения денежных средств на депозитном счете. Изучены понятия простого и сложного процента, преимущества простых и сложных процентов, их сходства и различия. Также выявлены актуальность и возможности созданного нами депозитного калькулятора, его преимущества и необходимые для расчета параметры.

The concept of "deposit" is quite common. The fact is that deposits have long been an integral part of the global financial system. Moreover, deposits are part of the daily lives of tens of millions of people around the world [3].

The purpose of the transfer of funds is to receive any income (usually in the form of interest), which is formed as a result of certain financial transactions with cash [3].

A deposit is a tool provided by financial institutions, most often by banks and credit unions. The deposit is designed to help customers store money and increase their savings. In other words, by investing money in a bank, the customer ensures its safe storage and receives interest as a reward, depending on the type and currency of the deposit, as well as the period of time the funds are in the bank accounts.

Many people think that a contribution is equal to a deposit. In a general sense, this is the right train of thought. When you come to the bank, you will be asked to deposit the amount exactly on the deposit, it will be listed as such according to the documents [2]. However, there is a difference between the concepts of contribution and deposit, which is insignificant for an ordinary investor. The first word is used if you brought money to the bank. A deposit is not only assets in cash, but also securities, metal and even real estate. In other words, a deposit is a broader concept that includes various objects for savings [2]. In our article we will apply the concept of contribution and deposit in the equivalent sense.

The entire deposit amount remains the property of the depositor and must be returned either immediately, at the request of the client, or at another time specified in the contract. Banks use the funds raised in deposits for commercial operations, including the issuance of loans [1]. Also, a banking organization places funds in the stock market by buying shares of other companies or state-level bonds. The bank uses its customer's funds, they are not idle. It pays interest for managing their funds. Depending on the type of deposit, a customer can do the following: withdraw accrued interest on the deposit during the term of the deposit and use them at their own discretion; increase the amount of the deposit; receive interest on the deposit at the end of its validity; freely increase / decrease the amount of the deposit. Interest is paid for a certain period of time, and not just for every week or month of a certain period of time. All interest on the total amount of the bank deposit is calculated from the day following the day the deposit is received at the banking institution. Accrual occurs until the day when the amount is returned to the depositor or until the day when the bank deposit is closed by the depositor. When choosing a bank for making a deposit, individuals and businesses compare interest rates and the amount of future income [4]. To simplify these tasks, we have developed a deposit calculator that calculates future income for different types of deposits, taking into account both simple and compound interest. A simple interest is understood as profit that is accrued only on the initial amount for each certain period of time. Compound interest is a slightly different form of calculating interest on a deposit. The profit here is not calculated on the initial payment, but on the whole amount, together with the already accrued interest, which is currently in the account of the depositor. That is, after each period, the amount on which profit is accrued proportionally increases. In fact, the system of accruing interest on deposits varies greatly primarily because the interest capitalization benefits deposit may be much higher than with a simple system. Because of a simple system, profit grows in arithmetic progression, and with a compound one the growth represents a geometric progression[5].

The deposit calculator of interest calculation will allow to do the following: calculate the profitability of a deposit with different interest payments: monthly, at the end of the term or with capitalization of interest on a bank deposit; find out what income can be received on the deposit, if you make regular replenishment of the deposit account.

The advantages of this application are the following [6]:

- 1) Automation - the ability to use for different sets of source data.
- 2) Ease of use - the developed application does not require special skills for its use.
- 3) Visibility - thanks to the application, you can analyze the profitability of the contribution and consider the possibility of influencing the source data.
- 4) Practical focus - the ability to use this application to practice skills in professional and educational activities.

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LIMITED COSTS: BOOKKEEPING AND TAXATION

ОГРАНИЧЕННЫЕ РАСХОДЫ: БУХГАЛТЕРИЯ И НАЛОГООБЛОЖЕНИЕ

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ABSTRACT

LIMITED COSTS, OTHER LIMITED COSTS, PROFITS TAX, TAX CODE, TAXATION, TAX RETURN

This article discusses the new concept of the Tax Code of the Republic of Belarus "Limited costs". It highlights problems related to practical usage of the listing of limited costs and their calculating. The impact of this innovation on the financial results of a certain organization was evaluated. The contradictions in the joint use of bookkeeping and tax methods have been identified and substantiated. The authors pay particular attention to the legislative framework.

АННОТАЦИЯ

НОРМИРУЕМЫЕ ЗАТРАТЫ, ПРОЧИЕ НОРМИРУЕМЫЕ ЗАТРАТЫ, НАЛОГ НА ПРИБЫЛЬ, НАЛОГОВЫЙ КОДЕКС, НАЛОГООБЛОЖЕНИЕ, НАЛОГОВАЯ ДЕКЛАРАЦИЯ

В данной статье рассмотрено новое понятие Налогового кодекса Республики Беларусь «Нормируемые затраты». На основе оценки влияния этого нововведения на финансовые результаты деятельности конкретной организации определены наиболее актуальные проблемы, касающиеся применения на практике перечня нормируемых затрат и их учета. Выявлены и обоснованы противоречия в совместном использовании методов бухгалтерского и налогового учета. Особое внимание обращается авторами на законодательную базу.

On January 1, 2019 the Tax Code of the Republic of Belarus [1] was amended by the Law of the Republic of Belarus dated December 30, 2018 №159-3 [2]. A new concept called "limited costs" was introduced. Limited costs contain certain costs of the organization (Clause 1, Article 171 of the Tax Code of the Republic of Belarus) and other costs (Clause 2, Article 171 of the Tax Code of the Republic of Belarus). This innovation raised a large number of questions among specialists.

New edition of the Tax Code of the Republic of Belarus has established that in the calculation of income tax the total amount of other limited costs cannot exceed 1 % of the revenue from the sale of goods (works, services), property title and the amount of income from rental transactions, other reimbursable or non-reimbursable property usage including value-added tax (Clause 3, Article 171 of the Tax Code of the Republic of Belarus) [1]. The question is how this "one percent rule" will be implemented.

The legislature presented this innovation as a tool to reduce the tax burden for organizations by providing them with the right to adjust certain types of costs for income tax purposes.

The example evaluates the impact of these innovations on financial results of a certain organization (the name of the organization was not indicated in order to preserve trade secrets). The data are presented in Table 1.

Table 1 – "Other standardized costs"

№	Line item	Total, rub.
1.	Revenue, including:	3,493,762.93
1.1	revenue from the sale of goods (works, services), property title	3,490,829.39
1.2	revenue from the sale of fixed assets, intangible assets, investments in long-term assets	
1.3	rental income	1,169.31
1.4	income from the sale of securities	1,764.23
2	Other limited costs, including:	194,438.72
2.1	other costs at net cost	109,363.29
2.2	other costs in operating expenses	85,075.43
2.3	other costs in financial expenses	
3	Costs included in the declaration	34,937.63
4	Limited costs not included in the declaration	159,501.9

In the current period the organization's revenue is 3,493,762.93 rubles (line 1). Other limited costs account for 194,438.72 rubles (line 2). According to Clause 3 of Article 171 of the Tax Code of the Republic of Belarus [1], the amount of other limited costs cannot exceed 1 %. The maximum possible amount of costs of the organization for inclusion in the profits tax return is presented in line 3 and accounts for 34,937.63 rubles. This amount will be deducted from the tax base, while the amount of limited costs which are not included in the tax return (line 4) is 159,501.9 rubles (line 2 – line 3).

Last year in order to determine the tax base instead of the maximum possible amount we would have taken the full amount of other limited costs – 194,438.72 rubles (line 2). So, the

tax base would have been less and profits tax would also be dramatically lower.

Based on the data presented in the example we can conclude that in praxi the "one percent rule" increases the tax base and as a result the profits tax for certain economic entities will be higher too.

Another argument is developed when discussing if revenue (income) from the sale of fixed assets and securities should be included into other limited costs. The profits tax return contains the following lines:

"1. Revenue (income) from sales: revenue (income) from sales on a reimbursable basis: produced goods (works, services); goods purchased for sale; fixed assets; intangible assets; enterprises as a property complex; property title, securities (income from redemption of securities), including:

1.1. Revenue from the sale of goods (works, services), property title on a reimbursable basis".

Line 1.1 data are used to determine the size of other limited costs. This line does not include all types of income indicated in line 1. But according to the Tax Code of the Republic of Belarus the indicators of lines 1 and 1.1 have to be the same, since the indicated types of revenue are taken into account for calculating other limited costs (Sub-clause 2.7 Clause 2 of Article 13) [1].

Table 2 – "Fragment of the profits tax return"

No	Line item	Total, rub.
1.	Revenue (income) from sales: revenue (income) from sales on a reimbursable basis: produced goods (works, services); goods purchased for sale; fixed assets; intangible assets; enterprises as a	3493762.93
	property complex; property title, securities (income from redemption of securities), including:	
1.1	revenue from the sale of goods (works, services), property title on a reimbursable basis.	3491998.7 (line 1 of table 2 - line 1.4 of table 1)

Compiled by the author based on Table 1

In Table 2 you can see that eventually line 1 differs from line 1.1 by the amount of income from the sale of securities. It means that the tax base will be less and as result the profits tax will also decrease since line 1.1 is used to calculate the tax base.

This discrepancy between legislation and reality confused many specialists. In fact, the indication in line 1.1 of the same amount as in line 1 (without deducting the amount of revenue from the sale of fixed assets and securities) may lead to an increase in profits tax for certain

economic entities.

Another problematic question is the inclusion of extra leave (monetary compensation for unused days) in other limited costs. Providing them is obligatory and established by law: the provision of extra leave indicated in Article 160 of the Labor Code of the Republic of Belarus [3] is the right of the employer, the leave confirmed by Decree of the President of the Republic of Belarus dated July 26, 1999 № 29 "On additional measures to improve labor relations, strengthening labor and executive discipline" (hereinafter – Decree №29) [4] is an obligation. So, the costs for paying extra leave for work under the contract by Decree № 29 are also have to be limited (previously included in costs). On the other hand, these leaves are additional for employees since they have contracts, and such costs should not be included in the limited costs. This problem has not been commented by the legislature yet.

The limitation of some costs is dramatically more difficult due to the lack of legislative standards valid for 2019. For example, it relates to costs of paying off overhead costs and technological losses (Sub-clause 1.6 Clause 1 Article 171 of the Tax Code of the Republic of Belarus) [1]. The limiting of these costs is obligatory only for organizations operating the housing stock and (or) providing housing and communal services (with the exception of organizations of the Ministry of Energy of the Republic of Belarus). These costs are taken into account for profits tax purposes within the norms and standards established by law. In 2018 these norms and standards were determined by a resolution of the Ministry of Housing and Communal Services of the Republic of Belarus dated June 15, 2017 № 8 [5]. In 2019 they have not been established yet.

For all the costs accounted for profits tax by established standards the question remains: in which cases these standards are established by law, and in which – by the head of organization.

In fact, the legislature defined a common concept of the definition of profits tax and simplified the taxation. But in bookkeeping practice it caused a number of problems with limiting such different costs.

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UDC 332.1

INTERNATIONAL COMPETITIVENESS CLUSTERS OF ECONOMY WITHIN THE FRAMEWORK OF EUROPEAN INTEGRATION

МЕЖДУНАРОДНЫЕ КЛАСТЕРЫ КОНКУРЕНТОСПОСОБНОСТИ ЭКОНОМИК В РАМКАХ ЕВРОПЕЙСКОЙ ИНТЕГРАЦИИ

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ABSTRACT

CLUSTER, INTERNATIONAL CLUSTERS,
TRANSNATIONAL CLUSTER, INTEGRATION,
COMPETITIVENESS, EFFICIENCY

The relevance of creating international clusters is proved in article. The specificity of European cluster policy is revealed. The definition of a transnational cluster is given; a transnational cluster is a combination of a network of clusters that share part of the results of R&D, use the network effect and economies of scale to promote products to new markets. The significance of international clusters is justified.

АННОТАЦИЯ

КЛАСТЕР, МЕЖДУНАРОДНЫЕ КЛАСТЕРЫ,
ТРАНСНАЦИОНАЛЬНЫЙ КЛАСТЕР, ИНТЕГРА-
ЦИЯ, КОНКУРЕНТОСПОСОБНОСТЬ, ЭФФЕК-
ТИВНОСТЬ

В статье обоснована актуальность создания международных кластеров. Выявлена специфика европейской кластерной политики. Дано определение транснациональному кластеру как совокупности сети кластеров, которые обмениваются частью результатов НИОКР, используют сетевой эффект и экономию масштаба для продвижения продукции на новые рынки. Обосновано значение международных кластеров.

The countries of the Organization for Economic Cooperation and Development (OECD), the countries of the European Union, the USA, China, India and many others have adopted the cluster concept of innovative development and increasing the competitiveness of economies. The Lisbon Strategy, adopted by the European Union in 2000, first formulated the European innovation policy. The Lisbon Strategy aims to develop a "knowledge economy" in Europe by encouraging research, improving education policies, developing information technology and creating a favorable innovative climate. The first set of measures of this strategy is aimed

at consolidating and coordinating the efforts of all participants in the innovation process, including by stimulating the organization of production clusters. In our opinion, a cluster should be understood as a network organization of complementary, interconnected relations of cooperation between enterprises and organizations (including specialized suppliers, including services, as well as manufacturers and buyers), united around one or several research and educational centers that are connected by partnership relations with local institutions and state bodies and regional government in order to achieve a synergistic effect that ensures increased competitiveness enterprises, regions and national economies [3].

About 3 thousand clusters operate in the European Union, which employ approximately 40 % of the workforce [1]. Clusters have different specializations (Table 1).

Table 1 – European countries ranking by the number of successfully developing clusters

Country	Number of clusters	Core specialization
Italy	206	Consumer goods and food production
United Kingdom	168	Biotechnologies and bioresources
France	96	Pharmaceuticals, cosmetics, food production
Denmark	34	No
Germany	32	Chemical industry, mechanical engineering
Poland	61	Construction
Netherlands	20	No
Finland	9	No

Source: based on [2]

Improving production efficiency based on spatial agglomeration of knowledge is achieved in the most developed countries through the formation of clusters, which may be regions, cities or rural settlements. Clusters are built as production networks, strategic alliances and partnerships of geographically close companies and non-production organizations in order to take into account the spatial aspects of innovation, including: closely related companies integrated into the production chain to create added value; universities; research institutions; venture capital companies and funds; technology brokers and consultants; government bodies.

The specific features of European cluster policy are the following: active methods of state intervention in economic development; development of cluster policy at the state level; transition from macroeconomic regulation to industrial and technological policies based on cluster development; the trend towards international integration of the process of developing cluster policies and regional initiatives under the auspices of the EU; registration of cluster policy in program documents subject to approval in the European Parliament and legislative

execution; a specific mechanism for the formation of clusters: a system of international legal and organizational structures has been created: Directorate General for Regional Policy of the EU (1968); European Regional Development Fund (1975); Charter of Regionalism adopted by the European Parliament (1988); Council of Regional and Local Communities (Committee of the Regions, 1993); government policy of stimulating the development of relations between universities, research institutes and business and attracting large foreign firms to the centers of knowledge and entrepreneurship; the prevalence of clusters in the "traditional" sectors: agriculture (Denmark), marine (Norway), forestry (Finland); the formation of centers of competitiveness and high technology, technology cities based on and around city universities; students take part in the work of firms; "pulling up" the backward regions through the formation of clusters based on innovative technologies; the formation of cross-border clusters.

The creation of international clusters, which are divided into cross-border and transnational, is becoming a global trend in the context of globalization. A cross-border cluster is an association of independent companies, public organizations, other subjects of cross-border cooperation, which are geographically concentrated in a cross-border region (space). Examples of cross-border clusters in the EU are the following: glass cluster in Upper Austria, Bavaria (Germany) and Bohemia (Czech Republic); textile cluster in Lower Austria and Bohemia; machine-tool cluster in Styria (Austria) and Slovenia; biotechnological clusters Eresund (Denmark-Sweden), BioDolina (Germany-Switzerland-France), Twente (Netherlands-Germany); information and telecommunication cluster «Dommel Valley» (Belgium-Netherlands); Consulting cluster Venlo (Netherlands-Germany).

A transnational cluster is a combination of a network of clusters that share part of the results of R&D, use the network effect and economies of scale to promote products to new markets. The French pharmaceutical cluster, which through Louis Pasteur University collaborates with the Canadian In vivo cluster operating in Montreal, is an example of a transnational cluster.

The value of international clusters can be determined in the following.

1. The formation and development of international clusters is an effective mechanism for attracting foreign direct investment and enhancing the foreign economic integration of countries. Clusters contribute to increasing the investment attractiveness of the region, as they have a positive impact on the innovativeness of enterprises. The clusters themselves are considered by investors as points of regional growth, which is the main incentive for foreign investors to place their investments on a given investment site. Clusters are able to attract foreign direct investment through the development of relationships capital, which in a certain region is transformed into the creation of a stable framework for cooperation in many areas between companies, partners, subcontractors and customers.

2. The inclusion of clusters in the global value chain allows to significantly increase the level of the national technological base, increase the speed and quality of economic growth by increasing the international competitiveness of enterprises within the cluster by: the acquisition

and implementation of critical technologies, the latest equipment; cluster enterprises gaining access to modern management methods and special knowledge; cluster enterprises gaining effective opportunities to enter highly competitive international markets.

3. The development of clusters ensures the optimization of the position of enterprises in production value chains, helping to increase the degree of processing of extracted raw materials, import substitution and localization of assembly plants, as well as increasing the level of non-price competitiveness of goods and services.

4. Enterprises of the industry can get new opportunities for development in the implementation of interstate cooperation, taking advantage of the common market. The development of integration in those sectors of the industry where there is the possibility of import substitution, as well as in the joint development of new technologies to create competitive products are currently promising areas of cooperation.

The integration of the Republic of Belarus into the world economic community, the development of foreign economic relations, industrial cooperation and cooperation of the international division of labor, all this made it possible to use a cluster approach to improving the efficiency and competitiveness of economic systems in Belarus. In the Republic of Belarus, the cluster approach to the modernization of the economy in the direction of innovative development is reflected in a number of state program documents that provide for the creation of clusters that act as growth points for the regional and national economies.

The creation of international clusters, including Belarusian and foreign manufacturers and organizations, will facilitate their integration into global value chains, as well as the creation of new value chains, which in general will contribute to the growth of our economies. The cluster approach is the most effective mechanism for the development of international economic interactions in modern conditions and, ultimately, is a mesoscale of competitive international integration systems and a necessary condition for a qualitative increase in the integration of European Union countries.

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UDC 332

INFLUENCE OF THE STATE AND LEVEL OF TRANSPORT DEVELOPMENT ON THE DYNAMICS OF MACROECONOMIC INDICATORS IN VITEBSK REGION

ВЛИЯНИЕ СОСТОЯНИЯ И УРОВНЯ РАЗВИТИЯ ТРАНСПОРТА НА ДИНАМИКУ МАКРОЭКОНОМИЧЕСКИХ ПОКАЗАТЕЛЕЙ В ВИТЕБСКОЙ ОБЛАСТИ

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ABSTRACT

REGION, MACROECONOMIC INDICATORS,
TRANSPORT INFRASTRUCTURE, CORRELATION,
ANALYSIS RESULTS

The article is devoted to the questions of region development and the significance of transport complex in it. The most important transport system indicators are determined. The degree of influence of transport infrastructure on the macroeconomic indicators dynamics in Vitebsk region is considered. Estimate is based on the correlation dependencies analysis.

АННОТАЦИЯ

РЕГИОН, МАКРОЭКОНОМИЧЕСКИЕ ПО-
КАЗАТЕЛИ, ТРАНСПОРТНАЯ ИНФРАСТРУК-
ТУРА, КОРРЕЛЯЦИЯ, РЕЗУЛЬТАТЫ АНАЛИЗА

*Статья посвящена вопросам разви-
тия региона и значимости в нем транс-
портного комплекса. Определены наибо-
лее важные показатели транспортной
системы. Рассмотрена степень влияния
транспортной инфраструктуры на ма-
кроэкономические показатели развития
Витебского региона. Оценка произведе-
на на основе анализа корреляционных
зависимостей.*

The stability of the regions and the country as a whole is largely determined by the level of development and the efficiency of the functioning of various industries and types of economic activity. A significant place in this case is occupied by the level of region's transport system development.

It relates to the following aspects. Firstly, the development of the transport system allows us to view the accessibility of various regions of the country, its resources and production capacities. Secondly, the level of transport services indirectly affects the level of wealth of

the population, as it contributes to the growth of employment, lower costs of production and distribution of products, the development of tourism and trade. Thirdly, the continuous functioning of transport in the region contributes to the solution of social problems, making various benefits are accessible and providing time savings with a high level of public transport organization.

Besides, cargo transportation demand is supported by cargo-creating sectors of the economy. In the context of economic growth, increase of industrial production, growth the sales and income, the demand for freight transportation is also growing. Among the factors that increase the demand for transport there are also globalization and integration of international markets, the improvement of vehicles and transportation technologies, including the development of logistics.

On the other hand, increasing the efficiency of transport operation is possible only with the sustainable development of the region, since this creates the prerequisites for additional investment in transport infrastructure, additional opportunities for optimizing transport flows. In addition, it becomes possible to solve the environmental problems of the transport functioning.

As a result, there is a decrease of the level of the transport component in the final price of goods, the elimination of economic imbalances between individual regions, increased access to new markets, the development of cooperation among economic entities. All these factors are significant competitive advantages of the region, which influence the economic growth.

Improvement of the transport infrastructure and conditions of the formation and development the transport services market leads to decrease of the cost of goods transportation and to increase of opportunities for access to various commodity markets. The growth of export opportunities leads to an increase the production and sales, a restructuring of the production line, the creation new supply chains, and a reduction the cost of production. Reducing the cost of transportation of goods leads to greater accessibility of markets, expands the labor market [112].

So, the analysis of the interaction of transport infrastructure and the economy, and also the measurement of the effect of this interaction is relevant for the economic stability and substantiating the development directions of regions.

To assess the impact of various parameters of the functioning of the transport infrastructure on the Vitebsk region economy, the dynamics of a number of indicators was analyzed.

Effective macroeconomic indicators are considered as those which largely characterize the level of development of the region, namely:

- gross regional product;
- volume of industrial production;
- retail turnover;
- the volume of foreign trade in goods and services (export);

- average monthly salary (table 1).

It is advisable to take into account the following indicators as ones reflecting the functioning of the transport complex and the development of transport infrastructure:

- volume of cargo transportation by road, million tons;
- freight turnover of vehicles, million t-km;
- passenger turnover, million pass-km;
- the length of the automobile roads, thousand km;
- density of paved roads per 1000 square km of territory, km.
- operational length of railway tracks, km;
- investments in transport activities, % of the volume of investments in fixed assets;
- the number of accidents per 100 thousand people.

To identify the type and tightness of the connection of the analyzed macroeconomic indicators and transport infrastructure characteristics, the correlation coefficients were calculated. In the Vitebsk region the most influence on the value of the main macroeconomic indicators is exerted by the indicators of the transport sector, marked by a plus sign (table 1).

Table 1 – The results of the correlation dependencies analysis

Indicators of the region	Indicators of transport infrastructure							
	Volume of cargo transportation by road, million tons	Freight turnover of vehicles, mln. t-km	Passenger turnover, million pass-km	The length of the automobile roads, thousand km	Density of paved roads per 1000 square. Km of territory, km	Operational length of railway tracks, km	The number of accidents per 100 thousand people	Investments in transport activities, %
1. Gross regional product, million rubles	+	+	+	+	+	+	+	-
2. Retail turnover, million rubles	+	+	+	+	+	+	+	-
3. Average monthly salary, rubles	+	+	-	+	+	+	+	-
4. The volume of foreign trade in goods and services (export), million US dollars	+	-	-	+	+	+	-	+
5. Volume of industrial production, million rubles	+	-	-	+	+	+	+	+

Source: developed by the author

The degree of influence of various indicators of the transport system on the main socio-economic indicators of the region indicates that in conditions of an increase the freight traffic by 1 million tons-km, the gross regional product of the Vitebsk region may increase by 4.74 million rubles; an increase in the length of roads by 100 km GRP will increase by 510.77 million rubles; an increase in the share of investments in transport activities by 1 % GRP will increase by 89.4 million rubles. In addition, the transport safety has a significant impact to the GRP change. Thus, GRP growth by 206.8 million rubles may be due to a decrease in the number of road traffic accidents per 100 thousand people.

At the same time, the change in the volume of cargo transportation and the passenger turnover of road transport has a negative effect on the GRP, which is associated with the ineffective functioning of transport organizations in the region, and as a result, low profitability of freight transportation and unprofitable passenger transportation.

As for such an important indicator of sustainable activity in the region as the volume of exports, indicators of the development of the transport sector have a direct impact on its growth.

Thus, with an increase of the volume of carriage of goods by road by 1 million tons, the value of exports throughout the region increases by 204.97 million US dollars, an increase in passenger traffic by 1 million passenger-km contributes to an increase in exports of 9.49 million US dollars.

A significant change in exports is also had place due to the development of the transport infrastructure of the region, namely:

- an increase in the share of investments in transport activities by 1 % ensures an increase in exports by 719.1 million US dollars;
- increase in the length of roads with improved coverage by 1 % - by 1853.7 million US dollars;
- the increase in the length of the operational routes of railway transport by 10 km is associated with an increase in exports by 646 million US dollars.

In addition, the table shows that the change in the performance of the transport complex also affects the performance of other areas of the region. Their improvement contributes to the growth of trade, the volume of activity of industrial enterprises, as well as an increase in the main indicator of the socio-economic sphere - the average wage. This dependence is absolutely obvious, since transport is not only the most important sector of the national economic complex, but also a link between enterprises and regions, which is ensuring timely delivery of materials, shipment of products, commodity supply of the distribution network, population transfer, etc. In other words, it creates the conditions for effective activities of business entities and a comfortable life for people.

The combined influence of factors based on the construction of multifactor models has shown that freight turnover (t-km), passenger traffic (pass-km), the length of railway transport

routes (km) and the level of road transport have the greatest impact on the value of all indicators.

Thus, the dependence between the level of development of the transport complex and the degree of sustainability of the region, between the quality of the transport infrastructure and macroeconomic indicators is obvious. Therefore, the further development of the transport complex and the improvement of transport services are the most important tasks of the region.

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