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Contents

SMART BUSINESS MODELS IN THE WORLD ECONOMY

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STRATEGIC ALLIANCES AS A FORM OF INTERACTION BETWEEN EDUCATION AND BUSINESS

Abstract:
Today, the accelerating pace of technological development of the society, globalization and informatization of the economy, the emergence of new industries and the continuous change of old ones, require the existence of a specialist who will be able to quickly adapt to the changes taking place. The model of education, which assumes that the student receives fundamental knowledge in isolation from reality, is not able to provide this kind of specialist. Strategic alliances can become a solution that will be a connecting element between education and business. The article will consider the main forms and motives of strategic alliances, analyze the effectiveness of practical cases for interaction between education and business.

Keywords:
Strategic alliances, education, business models, sustainable models.

The movement of the country towards the formation of an innovative type of economy assumes, firstly, the creation of close ties between education and business, and, secondly, the activation of the processes of internationalization in education. A noticeable trend is the active participation of Russian universities in international cooperation and the strengthening of interaction between education and business, often in various forms of international strategic alliances. The alliances in education are a characteristic manifestation of the current stage in the development of this sphere:

the formation of a highly competitive global market for educational services and the creation of closer connection between the university, one of the suppliers of innovation and a "factory" for creating human capital, and a business for which both innovations and human capital are critical factors of successful functioning.

Today, both education and business are facing problems that require a comprehensive solution with the active participation of both sides.

The following problems and difficulties are typical for Russian education:

- the gap between the content of educational programs and the needs of business: if 42% of employers think that newly graduated students are ready for work, then among educational institutions the same opinion is held by 72% (Barton, 2013);
- lack of practical experience in graduates: only 4% of graduates receive real support from the university in search of work and internships (Goncharova, 2016);
- weak correlation between the number of graduates and the quality of their training with the needs of the industry;
- the absence in the educational institutions of a sufficient material and technical and information base for the practical training of specialists and the development of innovative technologies: state support for creating a high-quality material base is not enough, and the active interaction of education, science and business is just beginning to develop.

On the other hand, before the big business, which seeks to take a leading position in the market, the following tasks and problems arise:

- the need for training and retraining of young professionals who do not have the necessary competencies for successful functioning in the framework of advanced business, or high costs of finding scarce human resources;
- creation and searching of innovative technologies, key for business;
- the transition from the creation of a product to the creation of an integrated solution that requires multidisciplinary specialists.

The solution of the above problems is possible through the establishment of effective and long-term contacts between universities and employers through the formation of strategic alliances.

Strategic alliances are a complex concept that, by combining different approaches of researchers (Hodgetts and Luthans, Deresky, Bobina, Grachev, Porter, Garrett, Dyussoj), the following definition can be given. This is a long-term cooperation of two or more firms, concluded with the goal of pooling resources, achieving goals that can not be achieved separately; limited control over the activities of the alliance is available for every independent participant.

For the leading industries, strategic alliances are a habitual tool for achieving goals, whereas for Russian education strategic alliances are a relatively new form of pooling resources.

In Russia, the creation of strategic alliances in the educational sphere was developed in the 1990s. The transition to a market economy opened new horizons for education, but also caused new difficulties. The new economic structure gave a start to the development of new industries, for which new specialists were required. The borders of Russia were opened for investors too: international companies entered the market and they began to form a high demand for qualified specialists able to work in a market economy. It became important for students to receive foreign education, and many would like to have the opportunity to obtain a university diploma that would be quoted from new employers. All these factors have caused the beginning of cooperation between Russian and foreign universities in the form of creating international strategic alliances. BRIDGE project was a vivid example. It envisaged the creation of 30-40 joint programs between Russian and British universities.

In order to understand for what purposes and in what ways it is possible to conclude strategic alliances between education and business, a theoretical analysis of different approaches to the classification of motives and forms of strategic alliances will be conducted, and then there would be attempt to understand what problems of the considered sectors the existing models can solve.

There are several approaches to classifying motives for creating strategic alliances. According to the theory of transaction costs (Williamson, 1991), the main reason for creating strategic alliances is the possibility of creating and using the effect of scale as a competitive advantage, as well as cutting costs. The theory of resource dependence (Gulati, 1998) argues that strategic alliances provide access to rare resources that are not available to

the company. According to the theory of competitive advantages (Porter, 1985), the creation of a strategic alliance is an opportunity for the company to improve its competitive positions and enter new markets.

S. Pivovarov offers a classification based on the needs of the company, which is about to create a strategic alliance. It distinguishes 5 groups of needs:

1. the need to penetrate new markets;
2. need for financial resources, assets and production opportunities;
3. the need for knowledge;
4. the need for staff;
5. the need to comply with industry regulation and reduce political risks.

M. Išoraitė (Išoraitė, 2009) bases classification on the opportunities that the alliance-creating firms acquire after the alliance is created. First, it is the division of risks associated with entering new markets and launching new products. Secondly, the opportunity to share with the partner the knowledge and experience necessary for a particular development strategy. Thirdly, it is an opportunity for synergy and creating a new competitive advantage.

Consider different classifications of forms of strategic alliances.

J. Dyer (Dyer, 2001) bases his classification on the property criteria. There are alliances with common property, including the creation of a joint venture, and investments in a partner company, as well as alliances in which there is no common property (contractual agreements that define the terms of partnership are created). A similar classification is proposed by T. Das and B. Teng (Das, Teng, 2000), separating the participation in capital and the creation of joint ventures.

R. Speckman (Speckman, 2000) prescribes a more comprehensive approach to classification. Forms of strategic alliances are considered by him in accordance with two criteria: the time horizon, reflecting the attitude of the participants to the duration of the alliance (long-term or short-term); degree of joint control over the functioning of the alliance (low in the absence of mechanisms for coordinating decisions, high with a careful analysis of the contract).

Strategic alliances can be joined by both competing and non-competing

firms. There are three types of alliances between non-competing firms (Karpukhina, 2004):

1. Transnational joint ventures. This type of strategic alliances involves the establishment of partnerships between companies located in different countries. As a rule, one of the partners has privileged access to the national market of the country where a new product will appear, and the second partner does not have a strong position in this market. The local partner uses its forces to adapt and distribute the products supplied by the foreign partner.
2. Vertical partnerships. Such relationships are used between firms instead of supply contracts, and can also be used to establish contacts with customers.
3. Cross-sectoral agreements. Companies that are not related to the same industries and do not enter into a competitive relationship with each other. As a rule, this is done to expand the boundaries of its activities and enter new attractive markets. It is the type of agreement that is used in the interaction of education and business.

Table 1 presents an attempt to develop a roadmap for universities and business in the sphere of their interaction based on the motives for creating strategic alliances, revealed in the course of theoretical analysis.

Table 1. Motives and forms for strategic alliances between education and business

Motive	Context		Form
	Education	Business	
Theory of transaction costs	The ability to implement large-scale projects that require high costs	The ability to implement large-scale projects that require high costs	Participation in capital and creation of joint ventures with a long-term time horizon, a high degree of joint control
Resource-Dependence Theory	The need for a material base	The need for human capital	Participation in capital, contractual agreements with long-term time horizon, low degree of joint control

The theory of competitive advantages	The possibility of supplementing the theoretical base of educational programs with a good practical part for increasing competitiveness	The possibility of obtaining exclusive development and highly qualified personnel, ideally suited to the company	Participation in capital and creation of joint ventures with a long-term time horizon, a high degree of joint control
The need to penetrate new markets	Creating an educational program in a new direction or opening a branch	Entering a new product market with the need for new technologies and personnel	Participation in capital and creation of joint ventures with a long-term time horizon, low degree of joint control
The need for financial resources, fixed assets and production opportunities	The need for laboratories and equipment to provide students with a material basis for practicing practical skills	- (business - provider of financial resources for education)	Participation in capital, contractual agreements with a short time horizon, low degree of joint control
The need for knowledge	- (education is a provider of knowledge for business)	The need for new exclusive technologies	Establishment of joint ventures, contractual agreements with a short time horizon, low degree of joint control
The need for staff	The need for professors with relevant relevant knowledge	The need for skilled personnel	Contractual agreements with a long-term time horizon, a high degree of joint control
The need to comply with industry regulation and reduce political risks	- (in this case, the strategic alliance is not a solution to the problem)	- (in this case, the strategic alliance is not a solution to the problem)	-

The division of risks associated with entering new markets and launching new products	Creating an educational program in a new direction or opening a branch	Entering a new product market with the need for new technologies and personnel	Participation in capital and creation of joint ventures with a long-term time horizon, low degree of joint control
The opportunity to share with the partner the knowledge and experience necessary for a particular development strategy	The possibility of obtaining support from the real sector for the direction of research in a practical way	The need for new exclusive technologies	The creation of joint ventures with a long-term time horizon, a low degree of joint control
The possibility of synergy and creating new competitive advantages	The possibility of supplementing the theoretical base of educational programs with a good practical part for increasing competitiveness	The possibility of obtaining exclusive development and highly qualified personnel, ideally suited to the company	Participation in capital and creation of joint ventures with a long-term time horizon, a high degree of joint control

Thus, it is obvious that a strategic alliance is one of the possible ways of solving the problems that arise before education and business in the condition of joint functioning. However, the implementation of this kind of cooperation in real market conditions causes a set of problems that have to be investigated further in order to understand the full picture of possibility of using strategic alliances in cooperation between education and business as well as in other kind of industries.

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E-BUSINESS STRATEGIES IN THE WORLD ECONOMY

Abstract:
Internet technologies are significant part of whole society. Most studies show that sales via e-commerce are constantly growing. Internet technologies provide opportunities for different-sized companies to expand their client base, have an active dialogue with stakeholders, enter new markets and optimize business processes. This article describes the basic concepts of e-business.

Keywords:
E-business strategies, e-commerce, Internet technologies.

Since the international market is represented by a large number of small and medium-sized enterprises (SMEs), article analyzes how to implement and maintain e-commerce in this business segment.

In addition, issues related to the application of social responsibility in e-commerce are disclosed. Many authors argue companies that focus their efforts on online sales must have an obligation to take care of the society and environment. Authors made an attempt to evaluate trade by the Internet as a factor influencing the application of a socially responsible strategy.

Keywords: e-business; e-commerce; smart business models; small and medium-sized enterprises (SMEs); CSR; social responsibility of business

The concept and role of e-business. The term "e-business" is understood as any business activity that uses the capabilities of global information networks to create profit. Electronic business includes: sales, marketing, financial analysis, employee search, user and partnership support. An integral part of e-business is e-commerce. It implies full cycle of operations, including the order of goods / services, payments, delivery of goods / services using IT which provide the transfer of ownership rights [2]. Often e-commerce involves the creation of a site through which customers can familiarize themselves with the product or service and purchase it [3]. There are several types of e-commerce: B2B (business entities interact with other enterprises for the sale by using the Internet); B2C (the process of selling products or services to customers by the Internet); C2B (this type of e-commerce provides the consumer the opportunity to independently determine the cost for various goods and services offered by companies); C2C (the scheme of electronic sale and purchase of the end user's goods from another end user, in which the buyer and seller are individuals) [3]. In this article we consider Internet strategies for B2B and B2C types of business.

At the current stage of economic development, e-business is gaining momentum. The Internet practically "erases" the geographical, communication and other barriers that are most typical for traditional forms of doing business. Global networks fundamentally changed the strategy and tactics of doing business [12]. At the moment, with the development of Internet technologies, companies of different caliber have the potential to expand their activities in national and international arenas.

Firms that use the Network to generate revenue gain additional opportunities and advantages over companies that avoid Internet sales. The main advantage is costs reduction [12]. Many companies have recognized the importance of developing an online platform for their business in order to provide a higher level of interaction with the client [6]. Today the question is raised about the transition of business strategies from e-commerce to social commerce. In general terms, the direction of social commerce can be characterized as a combination of new models of retail online sales or marketing strategies to promote sales through social networks [8]. Authors Chia-Ying Li and Yi-Cheng Ku argue that consumers perceive social

commerce as an environment in which all members are psychologically present, receive support from other consumers [8].

Internet strategies have advantages and challenges. Small and medium enterprises (SME) face more often with difficulties of implementation e-strategies than big companies. There are problems associated with logistics and payments, security and legal framework. Other problems that prevent business from participating in e-commerce: lack of awareness of e-commerce and e-commerce business models, lack of knowledge about e-commerce, trust issues, and others [10].

Social responsibility as an aspect of e-commerce. In addition, the topic of social responsibility of business in the e-commerce is gaining popularity in the scientific and business communities. The adoption of corporate social responsibility can be the main advantage foe companies in the market. Having a positive social goal that meets the needs of the company's target market can be a key factor for the success of online business. Companies can regularly report on the achievements of social goals and commitments using the Network.

In the survey conducted by Nielsen, 55% of international buyers (representatives of 60 countries) using the Internet stated that they would be willing to pay more for products and services of enterprises that have a positive social and environmental impact [4, 5].

S. Krätzig and B. Warren-Kretzschmar consider CSR within the framework of social networks. The emergence of online social networks provides companies with new alternatives in the field of CSR communications. Companies are increasingly using online networks for interactive communication with stakeholders on CSR [7]. On the other hand, users can use the Web to express complaints and negative impressions; this can lead to a very dangerous form of advertising that affects the reputation of the company [1].

In this article we attempt to find the link between CSR (corporate social responsibility) strategies adopting by SME and using e-business. We take part in the international project "Sustainable marketing concept and its implementation in selected European markets - identification of international differences". 6 countries with different levels of economic development took part in this survey: Russia, Poland, Croatia, Spain, Germany and Great Britain. We investigated the influence of factors such as: the presence

of a mission, the knowledge of CSR terminology, the number of personnel, the net turnover, the age of the firm, the sale of goods / services on the Internet, the country's GDP on apply social responsibility to SMEs. The survey involved 750 food companies (125 companies in each country) [9].

Was used the binary choice model (probit) to assess the impact of factors on the probability of social responsibility. The dependent variable takes one of the two values 0 (none) and 1 (yes) (Does the company use a socially responsible strategy?). Evaluation of the model was carried out in the software package "Stata". The formula for the binary selection model is presented below. It is worth noting that in our study there was no consideration of different channels of Internet sales, we considered a generalized factor – the sale of goods / services on the Internet.

$$P \text{ (practice)} = F \ (\beta_0 + \beta_1 \times \text{mission} + \beta_2 \times \text{term} + \beta_3 \times \text{staff} + \beta_4 \times \text{turnover} + \beta_5 \times \text{origin} + \beta_6 \times \text{p4\_31b} + \beta_7 \times \text{gdppc}),$$

where mission is a mission; term - knowledge of terminology; staff - number of staff; turnover - net turnover; origin - the age of the firm; p4_31b - sales of goods / services on the Internet; gdppc - GDP of the country, \$ / 1000.

The results of testing the binary selection model showed a positive impact of sales by the Internet on the application of a socially responsible strategy (table 1).

Table 1 – The results of testing the model of binary choice

Main factor	Coefficient	Marginal effects	Influence
Using the Internet as a channel for sales	0,235*** (0,076)	9,3%	A large share of sales on the Internet increases the likelihood that the company will have a socially responsible strategy

*** 1% level of significance. The standard errors are given in brackets. The number of observations – 560. Prob> chi2 = 0.000. Pseudo R2 = 0.157

Econometric analysis proved that the following factors influence the application of social responsibility:

1. Having a mission (formulated direction of development);
2. Knowledge of terminology (awareness);
3. The age of the firm (experience, established relationships with suppliers and customers, new ways of development);
4. Using the Internet (sales, dialogue with clients and partners, sharing the information);
5. Economic development of the country [9].

Conclusion. Internet technologies have a huge impact on changing business strategies around the world. Russian and foreign authors confirm the possibility of using Internet channels for increasing the client base, direct interaction with stakeholders, promotion and expansion of business in national and international markets. Internet strategies are actively used by large, small and medium businesses. These strategies have their advantages and limitations. Restrictions include: problems related to logistics and payments, security and the application of the legal framework.

The authors of some works argue that companies use Internet channels not fully. Changes in the management model are needed, starting with a real understanding of the Internet business channels based on proper planning, use and control.

In addition, the management of Internet tools can and should play an important role in the CSR strategy adopted by the company. An empirical study conducted in 6 countries with different economic levels of development has proved the positive impact of using the Network as a channel for sales, on the application of socially responsible business strategy.

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ADAPTATION OF THE CONCEPT OF WORLD CLASS MANUFACTURING (WCM) IN DIVISIONS OF MULTINATIONAL CORPORATION ON THE EXAMPLE OF LLC UNILEVER RUS KALINA

Abstract:
In this work assessment of efficiency of introduction of the concept of World Class Manufacturing (WCM) on the example of LLC Unilever Rus subsidiary Kalina. Object of research are optimization of production and logistic processes, WCM defining formation at the enterprise. Subject of investigation is optimization of production and logistic processes, WCM defining formation at the enterprise. Target of a research is the LLC «Unilever Rus» Kalina.
In the course a research the materials received in the course of practical work, given to financial statements are applied.

Keywords:
World Class Manufacturing (WCM); Lean Production; MNC; TNC.

Globalization forces firms to be more careful concerning satisfaction of the consumer and maximizing own profit. Therefore firms have to use various tools to increase the number of loyal clients who are less sensitive to incensement of the price of a product and have a big impact on

ensuring stable growth of commodity turnover and, as a result, growth of revenue of the company. The logistics is one of the key tools influencing the cost of production and forming competitive advantages of multinational corporation (MNC).

Adaptation to the current situation in the market moves the size of production capacities and at any changes the market makes new demands. The main aim for the company is customer satisfaction with the required quality, the variety of the released products at the price favorable for the client, and maintaining short terms of deliveries. Achievement of this purpose is possible by continuous improvement of operation from the enterprise.

On modern conditions of the market economy, effective organization of productions is the main reserve of the growth of the enterprise competitiveness. According to this, divisions of MNC in developing countries, aiming to improve the positions in the market, integrate world practices in the field of the organization of production and look for the ways to create effectively working production systems.

It is especially noted that the companies leaders constantly improve the quality of the delivered goods and services and at the same time reach the optimization of expenses through development and involvement of all staff of the organization in process of continuous improvement.

When studying foreign experience of the organization of production, Huge attention is paid to studying the foreign experience of the organization of production. It is possible to notice that rather large number of multinational corporation build the organization on the basis of the concept of the World Class Manufacturing (WCM), which means the production system of the world class representing the integrated model including various actions promoting the production process optimization based on the improvement of the quality of production, cut in expenditure at the preservation of flexibility of production.

Nowadays, the World Class Manufacturing includes 10 main directions: Safety, Cost Deployment, Focused Improvement, Autonomous Activity, Professional Maintenance, Quality Control, Customer Service & Logistics, People Development,

Equipment Management and the Environment. [1,6]

MNC could support constantly competitive level is required to improve constantly the components exerting direct impact on its stability and competitiveness have been for this purpose developed the WCM standards, following which MNC or any other company will be able to improve continuously all business processes, therefore, to be competitive and to open for itself the new markets. WCM is very expensive action therefore it can find the application only in MNC which have considerable capital potential, but the separate WCM elements can be applied also by representatives of business community.

The efficiency of development of MNC directly depends on development of logistic infrastructure. Continuous development of logistics at all levels, for successful realization of the strategy is required, to growth of competitiveness and optimization of cash flows.

Today MNC face such problem as lack of a unified information system when forming a chain of deliveries. Therefore for increase in logistic efficiency, especially within WCM adaptation, marketing has to not only form demand for a product. Creation of decisions in the field of distribution has to be, first of all, according to decision-making in the field of a product, it is caused by the fact that in process of increase in extent of distribution channels of production the final price of a product grows, as a result of it such negative effect as decrease in commodity turnover and the general competitiveness of a chain of deliveries of MNC appears. Minimization of such effect requires full integration and coordination between marketing and logistics of MNC. [7]

The main task of the concept of "integration" of marketing and logistics consists in constant exchange of information between all participants of supply chain. As a result of MNC has an opportunity to react in due time to changes of demand in domestic and foreign markets, to respectively be more competitive and profitable. Therefore it is very important to make correctly design of systematization of barter between all participants in chains of deliveries, interfacing technological features and economic opportunities of the enterprises.
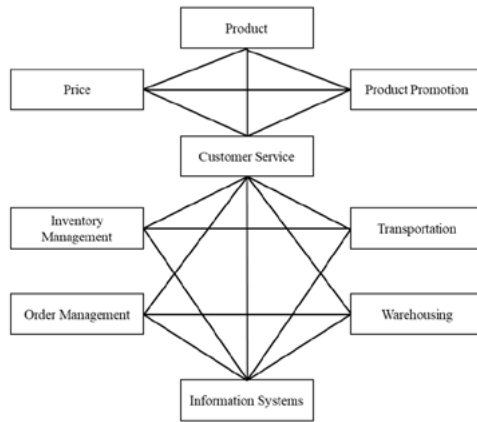
Pic. 1. Connection between Marketing and Logisctics [2,3]

The concept of interaction of marketing and logistics is the effective tool at the organization of marketing processes at all levels of barter, uniting in a uniform complex distributive operations of manufacturing enterprises with operations of purchase and a product's recycling in is wholesale - intermediary firms and marketing operations in retail trade enterprises. [3]

To provide of an effective logistics system within WCM it is necessary to work within the concept (Quality, Cost, Delivery).

Table 1 QCD concept (Quality, Cost, Delivery) [2]

Quality	Creation of the corresponding quality by good understanding of demands which are made by the client and ways of use of production. Achievement of production respect for appropriate level of quality. High-quality activity has to will focus on development of high-quality approach of management, assumes finding of ways to increase quality and to reduce defects.
Price	Production, within the competitive prices which are previously coordinated with clients. A problem of cost requires attention to logistic activity, namely the correct utilization which will allow to reduce the cost of production of a unit of production.
Delivery	Delivery of production upon the demand of the client (existence really requirements within the concept of Just In Time). As a rule it is very difficult for clients to predict demand, therefore, from the producer the flexibility on a short-term interval is required.

In practice it is required to define between what of characteristics of the concept of QCD the greatest failure and to take a number of measures for his elimination.

Quality activity will probably focus on development of high-quality approach of management, hoping to find ways to increase quality and to reduce defects.

The problem of pricing requires special attention, it is necessary to understand all components of which it is formed for objective vision, to logically define the directions which can reduce cost.

Delivery demands search of ways to increase flexibility of operation so that requirements of clients could be observed in time, every time

Then it is necessary to adhere to consecutive performance of all steps, for effective creation of a column of CSL.

At the moment the column of CSL of Kalina is on the second step. At a stage of reorganization of internal logistics the greatest expenses as for ensuring their maximum efficiency it is required changes of productions are assumed: modernization of production lines; reorganization of warehouse processes; reorganization of supply of lines, change of the principles of delivery; change of administrative approaches.
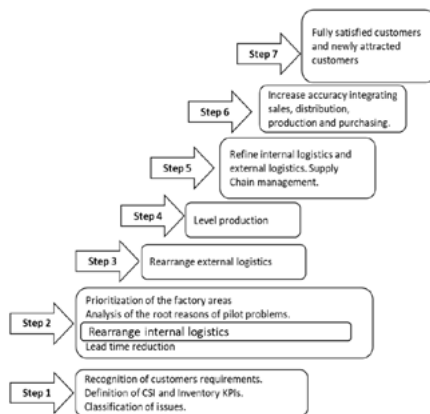
Pic. 2. 7 Steps of Customer Service & Logistics [11]

Reorganization of internal logistics is very expensive as it is required to pay attention to the next moments [6,8,9]:

- *Minimization of material handling.* Firstly, it is expenses, on the other hand they increase possibility of defects or delay and doesn't add for the client of value to a product.

- *Storage of optimum inventories at the end of each operation.* Each production site shall see how many it made. If there was an overproduction, it is necessary to stop production and to help the following section / operation for the purpose of creation of the synchronous flow between operations. Excessive production generates excessive inventories because of which double cargo processing.

- *Target and precisely during supply of materials (raw materials and packing) and return of an empty container and marriage.* Material has to be available to the production employee so close to a consumption point on how many it is possible from the point of view of safety. The operator shouldn't overcome long distances for material capture, otherwise it generates NVAA (Not Value Added Activities).

- *Supply of materials to production lines the optimized logistic stream.* The organization optimized logistic, for this purpose acts as the tool the logistic train which carries out supply of materials consecutive cycles which delivers materials sets.

Table 2 Key economic indicators of LLC Unilever Rus Kalina 2009-2016, million rubles.

	Период							
	2009	2010	2011	2012	2013	2014	2015	2016
Total Revenue(mln. rub.)	10133,4	11532,1	12093,6	13645,2	14231,0	15343,4	15512,8	16023,5
Rate of a gain, %	-	13,8	4,9	12,8	4,3	7,8	1,1	3,3
Total costs, including Costs of introduction of WCM (mln. Rub.)	9081,2	10261,7	10980,0	12736,8	13246,3	14173,5	14315,3	14744,7
Rate of a gain, %	-	13,0	7,0	16,0	4,0	7,0	1,0	3,0
Total Costs of WCM (mln. Rub.)	0,0	0,0	0,0	0,0	159,0	206,6	214,9	219,2
Total Profit before taxes (mln. Rub.)	1052,2	1270,4	1113,6	908,4	984,7	1169,8	1197,5	1278,8
Net Profit (mln. Rub.)	789,2	952,8	835,2	681,3	738,5	877,4	898,2	959,1
Rate of a gain, %	-	20,7	-12,3	-18,4	8,4	18,8	2,4	6,8

In October, 2011 it has been declared that Kalina's shareholders have agreed about sale of a controlling stake of the company (82%) English-Dutch to Unilever concern, by 2012 Unilever Kalina consolidated 100% of stocks of concern. Since 2013 rough integration of Kalina into the system of Unilever within which it was required to increase level of production, on condition of maintaining appropriate level of quality of production and optimization of production expenses has begun. Introduction of World Class Manufacturing in production divisions of Kalina became a basic element of integration.

Before WCM introduction Kalina had the steady growth of revenue, but at the same time on net profit the negative gain was observed, therefore, more and more seriously it was possible to speak about reorganization of production and logistic processes. Since 2013 the company begins to integrate the concept of WCM on the production divisions, means are actively invested in the period since 2013 so far. As it is possible to notice, already on the termination of 2013, the company it is possible to slow down the rate of a gain of expenses and to increase gross revenue, in 2013 the company comes to a positive gain of net profit which has made 8,4%.

In 2014 the maximum gain of profit in recent years which is directly connected with increase in gross production which arises in the investigation of the fact that Kalina successfully passes the first stage of integration of the basic principles of WCM is fixed (such as JIT, Kayzen, the program for utilization, etc.). During the period since 2015-2016 the steady gain of net profit is observed, at delay of joint costs and building of revenue of the enterprise.

Pic. 3. Connection of WCM introduction costs and net profit of LLC Unilever Rus Kalina

As appears from pic. 3, costs for introduction and fine-tuning of WCM gain the fixed character, with a stable growth of net profit. Therefore, generalizing told by me above, it is possible to say that introduction of WCM affects positively economic indicators of LLC Unilever Rus Kalina. It is worth to remember also about increase in level and quality of life of the population which is reached due to WCM introduction, way of competent recycling and decrease in harmful emissions in the atmosphere.

Table 3 Dynamics of factors of formation of the average price
f sale of a unit of production of 2012-2016, rub.

	2012		2016	
Factors	Rub.	%	Rub.	%
Material inputs (raw materials, packing, electric power and so forth)	13,67	27,12	14,42	32,51
Compensation of personnel (taking into account contributions to the Social Insurance Fund and PF)	17,16	34,05	12,34	27,82
Depreciation of MPF	17,94	35,59	14,13	31,86
Other costs	1,63	3,24	1,36	3,07
Costs of WCM	0,00	0,00	2,11	4,75
Total average prime cost of a unit of production	50,40	100,00	44,35	100,00
Marketing costs	3,20	-	4,10	-
Average price of sales of products	72,2	-	64,9	-
Additional cost of a unit of production (rub)	18,60	-	16,45	-
Additional cost of a unit of production (%)	25,76	-	25,35	-

Introduction of WCM has allowed to optimize the processes proceeding in divisions of LLC Unilever Rus, decrease in average prime cost of a unit of production by 2016 in comparison with basic 2012 for 6,05 rub or for 12% has turned out to be consequence. In the conditions of increase in release, such indicators have been reached due to decrease in a share

of depreciation charges of OPF in prime cost of a unit of production from 35,59% to 31,86% and decrease in expenses on compensation of personnel taking into account contributions to the Social Insurance Fund and PF from 34,05% to 27,82%. Further for sales promotion of production in the conditions of the increasing production it has allowed to reduce the additional cost of a unit of production on average for 2,15 rub.
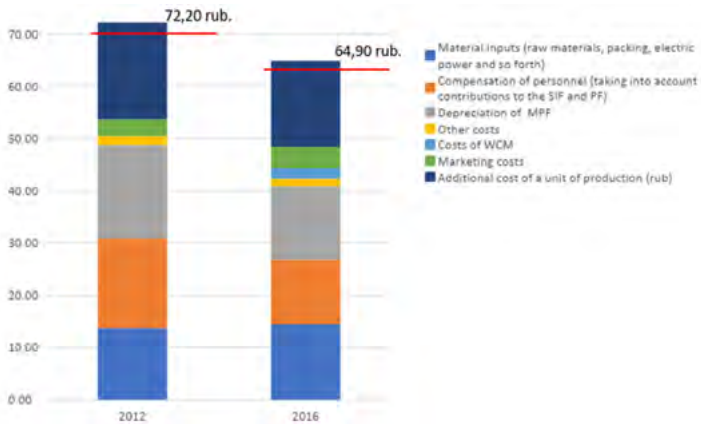
Pic. 4. Structure of the average price of the marketed production of LLC Unilever Rus Kalina 2012-2016.

Total by 2016 in the conditions of increase in overall price level on raw materials and accessories and the accruing competition, LLC Yunilever Rus Kalina has managed at the expense of optimization within introduction and adaptation of WCM in all divisions to reduce the average cost of unit of the marketed production from 72,90 rub to 64,90 rub or by 10%, on condition of growth of net profit for the end of 2016 which has made 40,77% since the moment of the beginning of introduction of WCM in 2012.

In general introductions of WCM not only reduction of price of sales of products and strengthening release, but also improvement of quality of products, increase in environmental friendliness of production, decrease in a human factor due to introduction of the technological optimization more motivated and employees, capable to sovershenstvovaniye, building of the base for all is result of new and new optimization and improvements.

All this speaks about in due time truly chosen direction of development of the company which will allow LLC Unilever Rus Kalina not only to hold a

market share, but also to increase it, first of all due to increase in sale of better production to foreign partners in more attractive prices.

During the conducted research, several reasons complicating adaptation of this concept in operating conditions of the Russian enterprises are established. One of the most important is personnel. Formation of personnel and management of it – here the most difficult task without which solution the long-term competitiveness of any organization in any country of the world is impossible.

Owing to various reasons, the rare enterprise can brag of level of training and qualification of personnel at all levels, and the personnel are a key factor of introduction of production concepts at the enterprise.

One more not less important condition is existence of a competent control system at the expense of which the effective plan of introduction and development of the enterprise will be created.

Despite all difficulties arising at introduction of a new production system at successful introduction of WCM at the enterprise it is possible to achieve superiority or equality with competitors in innovations, quality, the price, flexibility, discipline of deliveries and service. Moreover, application of the advanced techniques and achievement of successful results allow the enterprises to increase the authority, both on local, and on world the markets. At the macrolevel the investment attractiveness of the enterprise and the country in general as successful partner is formed.

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PROS AND CONS FOR THE CORPORATE SOCIAL RESPONSIBILITY POLICY: EXAMPLE OF CISCO SYSTEMS

Abstract:
For quite some time people, companies and international organizations began to talk about the concept of sustainable development. Today, there are real examples of the company's implementation of social responsibility. In our time, the ignoring of such concepts by firm executives jeopardizes moral, human, even criminal aspects, and also stimulates a drop in production and sometimes brings the firm to the bankruptcy zone, thus condemning its company to a slow extinction. However, it is interesting that not all organizations, including global ones, are thinking about this. What exactly can motivate these corporations to become socially responsible? Are there any real examples of companies that are interested not only in obtaining a positive economic profit? The study of these issues is one of the main objectives. But not everyone agrees with this statement. Some academics and scientists believe that this is contrary to the activities of any commercial company. As the discussion is under way, the relevance and timeliness of the topic can not be overemphasized.

Keywords:
CSR, economics, sustainable development.

One of the key processes in the development of the world economy on the verge of the twentieth and twenty-first centuries is progressive globalization, that is, a qualitatively new stage in the development of the economic life internationalization. It leads to the emergence of a fundamentally new concept within the framework of corporate governance — the concept of

corporate social responsibility. Also, it is impossible not to mention another important definition of sustainable development which means a development in which satisfaction of the vital needs of people is achieved and for future generations there is still the opportunity to satisfy needs [1, 2].

Any innovation suggests both positive reviews and negative ones. In the CSR topic, the latter have a fairly thorough assessment. Critics argue that the words «sustainable» and «development» contradict each other, since development in principle can not be sustainable: for some reason it is necessary to refuse — either from development or from sustainability. And yet development is stable if it implies some kind of invariance.

Despite a fairly high level of awareness of the sustainable development importance, many companies sometimes question the importance of environmental and social factors, arguably proving the significance of only economic indicators. The main issue in this discussion is the ability of sustainable companies to prove that the introduction of sustainable development policies can be an important "lever" for achieving high market outcomes. Corporations exist to produce products and provide services that bring profit to their shareholders. Milton Friedman and other scientists are considering this issue deeper, arguing that the corporation's goal is to maximize the incomes of shareholders and therefore only people can bear social responsibility, corporations are only accountable to their shareholders, and not to society as a whole [3]. Although they recognize that corporations have to obey the laws of the countries in which they work, they argue that corporations do not have obligations to society. Some people perceive CSR as a contradiction to the very nature and purpose of business, and also as an interference in free trade. Critics of this statement perceive neoliberalism as the opposite of the welfare of society and interference in human freedom. They argue that the type of capitalism practiced in many developing countries is a form of economic and cultural imperialism, noting that these countries usually had a lower degree of labor protection and therefore their citizens are at a higher risk of exploitation by multinational corporations.

Of course, there are a lot of controversial questions about the theory, as well as the implementation of sustainable development in practice, but if the concept is used in the right way, the company will manage to reach a new level for itself, increasing not only financial and non-financial indicators for itself, but also public welfare. This example is considered as practical

part in the example of Cisco Systems company. To conduct an in-depth analysis, it was used the report on the company's activities for 2012 – 2016, the corporate social responsibility report in 2014 – 2016, and the annual accounting reports in 2014 – 2016. The following regularities were examined: how strategic and system investments, as well as R&D costs, were influenced by strategic and system investments in non-financial indicators within the framework of sustainable development of Cisco Systems.

The empirical part of this work was the study and comparison of indexes and indicators of financial and non-financial reporting of Cisco — company that develops, manufactures and sells networking hardware, telecommunications equipment and other high-technology services and products. In the table 1 we can see all the financial indicators which we can compare with non-monetary data [4]. In appendix 1 there is specific values which will be useful for observation and research.

Table 1. Financial data

FY	2012	2013	2014	2015	2016
Strategic and Systemic Outstanding Investments, billion $	92,2	129,7	128,8	140,1	144,9
R&D Expenditures, billion $	5,5	5,9	6,3	6,2	6,3
Expenditures per one student in NetAcad, $	–	–	6290	6210	5779,8
NOPAT, billion $	8,25	10,3	7,766	9,849	11,513

When we have all the relevant data, it will be appropriate to evaluate and interpret them in order to understand the company's progress in terms of CSR. Observing the statistics in the table below, it should be emphasized

that the number of investments in turnover increased 1,5 times, which confirms the implementation of sustainable development goals, starting from 2015, as well as the concept of sustainable development.

Digitization enables countries to maintain global competitiveness, increase GDP, foster innovation, and create new jobs. That is why Cisco is trying to invest more and more money on information analysis, development and research centers. The cost of R&D has a slightly unstable dynamics, as they increased significantly in 2014, and in 2015 — after the introduction of sustainable development goals — slightly decreased. The costs per student in Cisco's Networking Academy have also decreased. It is impossible to interpret unequivocally: the number of students has increased and the costs have increased, but not in proportion. Since research costs are quite large, it is possible that after the introduction of sustainable development goals, Cisco redistributed resources in a more efficient direction and investors are expecting the improvement of the education quality while reducing costs. To understand whether a CSR strategy is profitable for a company, a net operating profit indicator after taxes should be interpreted: the emergence of 17 sustainable development goals as well as the introduction of many social programs in 2014–2015 influenced the profitability of the company, as reflected in the table below, however, we can see a significant return on the invested funds in the increased profit of 1,16 times.

By comparing financial and non-financial indicators using the table in the application, we observe a purposeful cash flow in the development of corporate social responsibility, and here it is necessary to emphasize — the efficient allocation of monetary resources. This is confirmed by the increased R&D costs, as well as the increased flow of investments. Efficiency is determined by a positive change not only in financial indicators — profit, ROI, and so on, but also non-financial ones, which were considered in this paper.

Ultimately, it is important to add that any firm strives to realize a commercial goal, like any socially responsible company. However, it is very important to consider the role of priorities. When we observe huge target expenditures for development, implementation of the concept of sustainable development, as well as a large number of attracted investments — and most importantly — their return, and see how the company assumes the risks of non-return of this money and potential failure, the main question

arises: does only profit excite a socially responsible company when it so risks? It is also necessary to realize that a successful socially responsible strategy has a significant impact on the company's image, which is why companies such as Cisco should motivate other corporations to implement this concept.

As recommendations, it will be appropriate to advise Cisco to pay attention to all the goals of sustainable development, since the previous experience of considering each goal results in a positive return. Of course, Cisco's strategy will depend on the trends of the global community and the principles of implementing the strategy will eventually change and be adjusted. In any case, every firm that wants to be successful in the current market should think about the principles of CSR and decide on the potential implementation of this policy, placing all priorities and considering the opportunities and threats. Ignoring this trend is not the best solution and this is shown by other companies like Cisco, who have already successfully implemented the principles of sustainable development.

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Appendix 1. Special values of indicators

Measurement	Years/indicators	2013	2014	2015	2016
2013 – base year	R&D expenditures	100,00%	105,89%	104,55%	106,06%
	Investments	100,00%	99,25%	107,95%	111,68%
	audits	100,00%	100,00%	135,29%	161,76%
by the percent of spend	Contract manufacturing	100,00%	100,00%	100,00%	100,00%
	Approved Vendor List (AVL) components	86%	87%	87%	87%
	Global transportation	98%	95%	96%	96%
2013 – base year	Total supplier and partner facilities	100,00%	65,38%	88,46%	105,77%
	Total System Power Efficiency	100,00%	102,50%	103,75%	106,25%
2014 – base year	GHG Emissions Reduction	-	100,00%	66,29%	54,39%
	Supply Chain Emissions Avoided (cumulative metric tonne CO2e avoided)	-	100,00%	180,87%	286,29%
percent progress against reduction goal	Electricity Usage from Renewable Sources	-	37,10%	71,90%	77,10%

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GLOBAL MEDIA MARKET: EXPLICIT TRENDS AND IMPLICIT BUSINESS OPPORTUNITIES

Abstract:
The growth of the particular global sphere of the economy is a call for action for countries which have the surplus of particular needed resources. The purpose of this paper is to draw attention to the growth of global media industry and availability of appropriate human capital in Russia for expansion into new developing market. During the work we used methods of empirical study such as: data collection and analysis, synthesis and measurement. We worked with official statistics, reports of nonfinancial and consulting organizations. Methods of theoretical study including abstracting, induction and deduction were also used.
As a result, the strategic vision of entering Latin America media market for Russian media enterprises is formed, including the description of the main development trends of the industry. The scheme of RT's media network, as an example of successful expansion in observable sphere, was compiled.

Keywords:
global media industry, human capital, development trends, service economy, media, content, RT, creative consumption

Shifting to service economy and creative consumption

Global economy has dramatically changed in the course of the last 20 years. Since 1995 the global GDP in current US$ has increased 2.45 times in comparison with the year 2016 [1]. But what is more important is the fact that global GDP composition by sectors of origin has seriously changed as well. In 1995 sector of services produced 58% of global GDP, in 2016 this amount has went up to 63.6% [2]. This trend is going to stay.

Nevertheless, main changes are not related to the numbers. In accordance with Yaroslav I. Kuzminov, a NRU HSE Rector's, the present consumption model will become more creative in the near future as information, knowledge, ideas and meanings – human capital, in general – will become the main trade commodity [3].

Kuzminov's ideas can be supported by the example of global media industry development. During 2010-2015 it has increased at 6.3% compound annual rate (CAGR). According to McKinsey's forecast and preliminary estimates during 2016-2020 CAGR of global media industry will be reach 5.2%. In 2016 the market size was 1.69 trillion in current US$, in 2020 it will be $2.06 trillion [4].

In addition to the foresaid, we need to pay attention to the following issues. Firstly, it is obvious that intensive industry growth provides good chances for new players coming into the market, assuming that the potential participant knows market trends and its main features. Secondly, global economy will be different from what it is today in the nearest future, and therefore, the present day is a high time to start "production" of new types of commodities, experiments and re-engineering of economy sectors.

Economic opportunities of developing Latin America media market

Specialists of McKinsey divide global media industry into 6 main regions. The dynamic of their growth can be seen in the Table 1.

Table 1 Total global spending by region1, US$ millions (Global Media Report, 2016)

Region	2010	2015	2010– 2015 CARG, %	2016	2020	2015– 2020 CAGR, %
North America	402.75	497.06	4.3	522.12	600.34	3.8
Western Europe	308.86	349.44	2.5	360.64	404.34	3.0
Central and Eastern Europe	31.70	46.17	7.8	48.33	60.84	5.7
Middle East / Africa	23.66	51.29	16.7	56.86	83.45	10.2
Asia Pacific	354.62	533.72	8.5	569.30	720.78	6.2
Latin America	55.30	122.87	17.3	134.21	189.05	9.0
Total	1176.87	1600.55	6.3	1691.47	2058.79	5.2

As it is mentioned in the table, there is a group of fast-growing markets: Middle East/Africa, Asia Pacific and Latin America. Speaking about economic perspective, they seem to be the most preferable pones.

However, media industry has its own features related to communication and one of the most important of them is language. In fact, language is a major barrier prevents the content flow from entering the country, in case the recipients speak different languages.

With regard to Appendix 1, there only two language-homogeneous regions. North America, where English is the most commonly used language and Latin America where Spanish is widely spread (except of Brazil – where Portuguese is spoken). In the Table 2 there are main economic indicators of Latin America countries to estimate their financial position.

According to the 20th edition of study «Ethnologue: Languages of the World» Spanish is the second most spoken language in the world referring to the number of native speakers – around 437 million in 2017 [5]. Regarding the given, provided by the Cervantes Institute in 2017 there are even more native Spanish speakers – around 477 million. In the report of the Institute it was also stated that there are 572 million people across the world who speak Spanish, which is equal to 7.8% of the world population [6].

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1   At average 2015 exchange rates.

Table 2 Main indicators of Latin America countries in McKinsey's report (World Bank, 2016)

Country	Language	Population, ml people (in 2016)	Spanish-spoken, % of country population	GDP per capita, current US$	GDP, bn current US$
Argentina	Spanish	43.85	98.1	12449	546
Brazil	Portuguese	207.65	0.26	8649	1796
Colombia	Spanish	48.65	99.2	5805	282
Mexico	Spanish	127.54	96.8	8201	1046
Venezuela	Spanish	31.57	97.3	12237 (year 2013)	371 (year 2013)
Chile	Spanish	17.91	95.9	13792	247
-	55.17% of total Spanish-spoken in the world			-	-

Key global trends of global media industry

In order to enter the new market and, especially, new industry it is important to understand its main drivers. In the Global Media Report prepared by McKinsey 5 key global trends of media industry development were mentioned. In fact, experts have marked out key aspects fostering successful media business integration.

The first trend is related to the transition from traditional to digital media. In 2015 the digital share of total spending in media industry was 45.2%. McKinsey researches expect that digital spending to overtake traditional media spending by 2018 [4].

The second trend is the shift from online to mobile sphere. The media is very often accessed through mobile devices. 44.6% of digital spending in 2015 was captured by mobile. Meanwhile growth in mobile broadband penetration has been creating new opportunities for media spending and advertising, e.g. mobile video games, digital streaming, the media, etc. [4].

The third trend deals with the transition from ownership to open access. It means that more and more people in the world prefer accessing content rather than buying it. McKinsey experts stated that the access spending will overtake ownership spending in 2017 [4].

The forth trend is connected with the global advertising spending growth. It is believed to be faster than global consumer spending [4].

The fifth trend has to do with the resilience of television. In spite of global digitalization traditional television still appears to be the largest component of the traditional media market. It was around 47% of all non-digital media spending in 2015. Moreover it will be showing growth in the future and accounting for the most part of non-internet advertising following years [4].

These trends denote the fact that in the near future a media company should:

1. Provide its services through digital channels;
2. Adopt the access to its content via mobile devices;
3. Be ready for the main income to be coming from advertising;
4. Take into consideration the importance of TV-channels as a huge niche of media industry.

Successful transnational and multilingual media practices: RT case

In our opinion, transnational and multilingual media serves are good examples of successful taking up of the opportunities mentioned above. One of such media groups is RT.

As it is stated on the official company's web-site, "today RT is a global, round-the-clock news network that includes seven TV channels broadcasting news, current affairs and documentary content, digital platforms in six languages and a video new agency RUPTLY. … RT is available in more than 100 countries spanning 5 continents" [7].

According to the Ipsos survey of TV news consumption conducted in 2015 in 38 countries 70 million people watched RT channels every week and 35 million did it on a daily basis (Fig.1) [8]. RT was in the top 5 pan-regional news channels in Europe and made top-5 list of most watched international TV news channels in the US.

- Europe
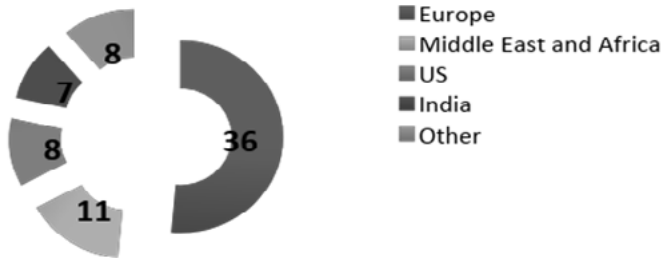- Middle East and Africa
- US
- India
- Other

Fig. 1. Composition of the RT's weekly audience
by regions/countries in 2015, mln. People (Ipsos, 2015)

According to comScore, the aggregate number of unique users for all of the RT's websites and YouTube accounts reached 49 million in November 2015. That month RT also was a world leader among non-Anglo-Saxon international TV news channels in terms of worldwide PC audience, ahead of Al Jazeera, Deutsche Welle, Euronews, etc. [9].

According to comScore study, in the US 59% of RT.com's unique users come from mobile devices, in the UK – 66% (November 2015) [9].

In 2013 RT's YouTube channel became the first TV news channel in YouTube's history to reach one billion views. All RT's channels (around 20) have drawn 5 billion views and 6 million subscribers [7; 10].

In 2017 RT's main English-language YouTube channel has around 2.1 billion views and 2.2 million subscribers. It is quite similar to the figures, presented by the CNN's primary YouTube channel and even higher than Fox News's main channel has. WSJ called it the YouTube's most-watched news networks [10].

The RT's success on the media market is closely linked to its unique content, combination of digital and traditional platform while entering the market, audience's interest in Russian, usage of modern hard and soft media technologies (for example, 360 degrees video content) and the complex promotion including social networks, main of which are YouTube, Twitter and Facebook.

According to A. Lavrova, complex promotion is creation of account in different social networks and simultaneous publication of content. This approach fosters full coverage of target audience [11].Main parts of today's
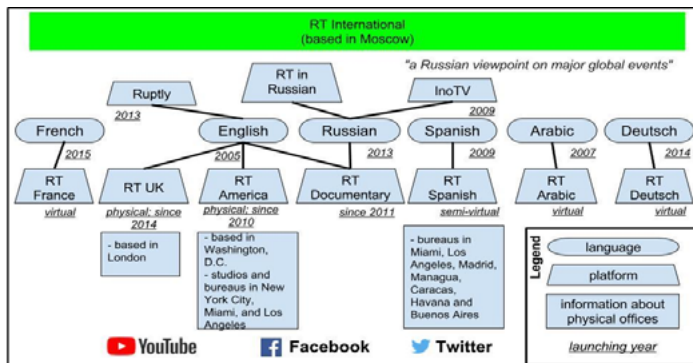
network of RT are represented in the Fig. 2.

Fig. 2. Today's RT's media network scheme (RT.com, 2017)

Furthermore, manpower policy of RT is also an important component of its success. In 2005 25-year old Margarita Simonyan became the first youngest ever editor-in-chief of the major TV network. At the beginning there were many freelance reporters working for RT, and as a result, more than 100 journalists delivered news stories from all over the world [7].

Despite the fact that RT is a noncommercial organization financed by the Russian government, its expansion strategy can be used by any big media company. Its main features are digital presence in the Internet (including social nets), TV-broadcasting and creative approach.

Key requirements for the staff of the media company are ability to work 24/7/365, fluency in a foreign language(s), audience-centricity, mental appliance to audience, deep knowledge of culture, sport, politics of the target country, etc. [12]. Requirements stay the same despite of the business size.

The case of the French public national television broadcaster France Television and its department Le département Nouvelles écritures shows that the group of 4 people with the budged of 800 thousand EURO may significantly change the image of the channel [13]. The case confirms that the human factor is a key element for success of a media company, and staff recruiting is among the most important concerns for the manager.

Unused Russian labor forces qualified for global media industry

There are many high school graduates from all over Russia, whose educational background appears to be quite preferable for working in a media industry (here we are talking about creation of content and working with people). Ironically, under the conditions of the current Russian labor market those graduates are normally offered quite low salaries and, moreover, they also have certain difficulties with employment. We can observe this situation by the example of UrFU graduates [14] (Table 3).

Table 3 Information about UrFU graduates of different academic majors in 2014-2015, 2015-2016 academic years (Ministry of Education and Science of the Russian Federation, 2017)

Specialty	Number of graduates, people	Average salary, RUR	Level of employment, %	Desirable background for media industry (yes/no)
Academic year	2015-2016			
Psychology	31	17900	64,5	yes
History of arts	17	21923	64,7	yes
International relationships	13	33480	69,2	yes
Philosophy	65	26545	75,4	yes
Design	40	15267	76,9	yes
Palynology	9 25814 77,8			yes
Linguistics and study of literature	135	25330	78,4	yes
Journalism	51	26469	80,4	yes
Machine building	344	43022	91,3	no
Material technology	306	35349	91,5	no
Academic year	2014-2015			
Psychology	10	23470	50	yes
History of arts	71	21947	75,4	yes

International relationships	33	19304	75,8	yes
Philosophy	69	24827	76,5	yes
Design	10	34460	80	yes
Palynology	144	22875	81,1	yes
Linguistics and study of literature	130	23136	82,9	yes
Journalism	43	20609	85,7	yes
Machine building	308	36108	86,2	no
Material technology	295	33007	91,8	no

The situation with employment process of UrFU graduates seems to be similar to other universities and regions of Russian Federation. People graduated from in essence creative academic majors appear in worse conditions than those who finished machine building, material technology or IT specialties. Moreover, graduates from creative specialties get a lower salary.

Wide opportunities on international media market, for example, in Latin America, and low demand for the graduates who can potentially work in media companies in Russia create conditions for launching media companies, oriented on foreign audience, in Russia.

Concerns and conclusions

During realization of the proposed model – exporting content from Russia to countries of Latin America – several challenges and barriers can appear. Let's denote them, dividing into short run and long run groups.

In a short run the model can be confronted by following difficulties:

- the lack of specialists who speak Spanish fluently;
- staff recruitment may be expensive;
- YouTube monetization policy is changing now which affects new developing YouTube channels (they don't receive money for their content).
- Russia is still affected by the Western sanctions. Launching numerous media ventures in Russia may be interpreted as a soft power arising.

In a long run the main concern is an unstable situation in countries of

Latin America and Spain (Catalonia crisis) can stop economic growth in the Spanish-spoken communities which may slow down digitalization process and make the audience unattractive for advertisers.

The shift of global economy to rendering of services and creative consumption seem to be an unavoidable process. The earlier country, Russian states, private investors and entrepreneurs see the opportunities and start entering this market, the better strategic position they will have. The global media industry is only one of the new economy sectors. But it could open chances for better economic and political relationships with target countries, regions and even cultures.

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8. RT has TV audience of 70 million weekly viewers in 38 countries – Ipsos // RT.com. Press releases. 10th March, 2016. Retrieved from: https://www.rt.com/about-us/press-releases/rt-largest-audience-europe.
9. RT's online audience approaches 50 million unique users monthly // RT.com. Press releases. 29th February, 2016. Retrieved from: https://www.rt.com/about-us/press-releases/rt-audience-digital-web.
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11. Lavrova A.G. The cross-platform spreading video content in social networks on the example of the project "YouTube channel of Vitaly Orekhov"// Meteor-City. 2016. №3. Pp.34-40.

12. Tupitsyna I.N., Mirimanov D.A. Sociokulturnaya missia telekanala Russia Today [Sociocultural mission of Russia Today] // Scientific notes of RSSU. 2008. №2. Pp. 85-92.

13. Vasilyeva A.V. Leaders in the development of Internet TV France // Modern Research of Social Problems. 2013. №6 (26). P.4.

14. Monitoring Graduate Recruitment [Electronic resource] // Minobrnauka RF. Retrieved from: http://vo.graduate.edu.ru (accessed 31 October 2017).

Appendix 1

Counties which participated in McKinsey & Company's Global Media Report 2016 (Global Media Report, 2016)

Region	Countries
North America	United States, Canada
Western Europe	Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom
Central and Eastern Europe	Czech Republic, Hungary, Poland, Romania, Russia, Turkey
Middle East/Africa	Israel, Algeria, Bahrain, Egypt, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Syria and the United Arab Emirates, South Africa
Asia Pacific	Australia, China, Hong Kong, India, Indonesia, Japan, Malaysia, New Zealand, Pakistan, Philippines, Singapore, South Korea, Taiwan, Thailand, Vietnam
Latin America	Argentina, Brazil, Chile, Colombia, Mexico, Venezuela

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ONLINE SHOPPING AND DRONE TECHNOLOGY IN RUSSIA

Abstract:
As the escalation of online shopping toils its capacity in Russia, the effectiveness of last mile delivery has gained total attention since it one of the core phase of an effective transaction via online shopping. Last mile delivery is facing a series of stumbling blocks of which the main ones are; poor infrastructure in rural and disaster-stricken areas and extreme climate condition (winter) hence forcing companies, to incur more the costs at this stage than any other stage. The emerging drone technology with tremendous anticipated applications of which one is delivery, may be the ultimate solution to cutting down costs and ease on the difficulties of last mile delivery. However, like any other technological innovation, drone technology is associated with uncertainties which are regarded as risks, several technical and societal concerns and challenges that need to be addressed. The goal of this review paper is to analyze the feasibility of drone technology in last mile delivery by carrying out its SWOT analysis and point out risks that may arise once deployed to delivery. And carry out a comparison between the current legal framework in Russia with that of major international key players in the technology in order to find out the loop holes and possible steps necessary to be taken towards regulating drone delivery in Russia.

Keywords:
Drone technology, Last mile delivery, Drone Delivery, Risks, legal frame work, Comparison.

1. Introduction

The Internet has enabled most companies in Russia to provide a giant catalog of goods and services through adapting to a strategy of having online stores with virtual products that far exceeds what a physical local store could accommodate [2] hence driving down storage costs at the physical location and increase on their consumers' base. About 70% of the population in Russia amounted to around 146.3 million people are internet users, making Russia Europe's number one in terms of internet users [3] and 1.2 per capita are smart phone users. In 2016, Russian e-commerce market raised to approximately $16.3 billion for physical goods alone, including an estimated $4.3 billion for foreign e-commerce sales up to 26% by value and 80% by number of parcels and small packages mainly from China [4]. The market estimates were speculated to top $17.1 billion in 2017 according to (AKIT) Association of Online Retail Companies. Consumers in search of affordable products, a large customer choice base, want to save time and have a greater possibility of saving money have turned to online retailers like Ulmart.ru, Wildberries.ru, Mvideo.ru, AliExpress and Avito.ru among others to delivery desired goods to on their door step.

With the growth of Internet sales, there is growth in the delivery industry. Foreign online shopping companies rely on third parties (private carriers) like Courier service Express, DHL, Four sides, Express.ru, CPCR –Express and Pony Express among others to delivery customers' goods to their door steps. Whereas the Russian local online shopping companies offer their own delivery means to the customer's location and don't rely on any third party company. Either way for both local and foreign online companies, last mile delivery is a core stage in delivery process. Considering all the phases from customer's order to home delivery by seller, logistics providers and transportation companies have found the last mile delivery to be the most complex and incur the highest cost [5].

2[] Applin, S. A. (2016). Deliveries by Drone: Obstacles and Sociability. In The Future of Drone Use (pp. 71-91). TMC Asser Press.

3[] Timofeeva, A. (2017). E-commerce market research and strategy recommendations.: Case study: Russian Post North-West macro-region business unit in Saint-Petersburg.

4[] Khare, A. (2016). Consumer shopping styles and online shopping: An empirical study of Indian consumers. Journal of Global Marketing, 29(1), 40-53

5[] CBINSIGHTS. (March 30, 2017). Automating The Last Mile: Startups Chasing Robot Delivery By Land And Air https://www.cbinsights.com/research/autonomous-drone-delivery-startups/

Existence of major challenges like poor infrastructure, harsh climate (winter) which makes some roads impassable and geographical location of customers, accounts for the high cost incurred in the last mile delivery. This has made companies to anticipate a reduction in transportation costs by using drones for delivery [6]. As drone technology is also penetrating in consumer market with its ability to traverse difficult terrains, reduce labor, and replace fleets of vehicles [7] it is seen as one of the best possible solution to challenges faced in the last-mile delivery. Drone technology has the potential to significantly reduce the delivery costs and save time required to deliver packages and is less expensive to maintain, not limited by established infrastructure such as roads and generally involves less complex obstacle avoidance scenarios as compared to the traditional delivery vehicles such as trucks [8]. There is a perception there will not be any need to make frequent stops on a route since delivery drones will provide even faster direct service [9] as packages will no longer have to be individually delivered by hand from a truck that is bound by the traffic rules and patterns [1]. This idea is so alluring that large companies have embarked on a journey to develop a model to enable them deploys drones in the last mile delivery.

2. Drone delivery testing

A series of drone testing for commercial delivery have been and still going on for quite a long time dating back in 2012, when Silcon Valley startup Tacopter [10] made headlines as it publicly announced plans for the delivery service of Tacos within the city of San Francisco via unmanned aerial vehicles

6[] D'Andrea, R. (2014). Guest editorial can drones deliver?. IEEE Transactions on Automation Science and Engineering, 11(3), 647-648.

7[] Haidari, L. A., Brown, S. T., Ferguson, M., Bancroft, E., Spiker, M., Wilcox, A., ... & Lee, B. Y. (2016). The economic and operational value of using drones to transport vaccines. Vaccine, 34(34), 4062-4067.

8[] Dorling, K., Heinrichs, J., Messier, G. G., & Magierowski, S. (2017). Vehicle routing problems for drone delivery. IEEE Transactions on Systems, Man, and Cybernetics: Systems, 47(1), 70-85.

9[] Limer E (2015) Amazon says its drones will deliver in 30 minutes or less. Popular Mech. http://www.popularmechanics.com/flight/drones/a16074/amazon-drones-30-minutes-or-less/. Accessed 20 Sept 2015.

10[] Gilbert, J. (2012). Tacocopter aims to deliver tacos using unmanned drone helicopters. The Huffington Post.

(UAVs), In 2013, Amazon [11] with a proposal of prime air that could deliver packages to customers in just 30 minutes. In 2013, Deutsche post DHL [12] a logistics company in Germany also started its Parcelcopter project. In June 2014, a Russian company Dodo Pizza [13] became the first to make a trial deployment of a drone in the last mile delivery. In March 2016, the largest convenience chain 7-Eleven [14] and a drone startup Flirtey, made a drone delivery in Reno, Nevada making it the first one to be approved by the aviation officials (FAA). In April 2016, a Japanese eCommerce giant Rakuten [15] made a test service delivery of golf balls and refreshments using a drone on request via phone by players on a golf course in Japan's Chiba prefecture. In September 2016 an American based logistics company UPS [16] tested a medical supply drop to an island off the coast of Massachusetts; in the same month, Alphabet Inc's drone delivery initiative, project wing sent burritos to students at Virginia tech.

In November 2016, Flirtey and Domino's Pizza Enterprises Ltd [17] delivered pizzas from Domino's stores to select customer homes in New Zealand as part of Enterprise's ongoing drone delivery testing. Since mid-March 2017, Swiss Post [18] has successfully been conducting drone flights in Lugano testing transportation of laboratory samples between two Ticino

11[] Woolf, N., & Gibson, S. (2016). Amazon to test drone delivery in partnership with UK government. The Guardian.

12[] Scott, J., & Scott, C. (2017, January). Drone delivery models for healthcare. In Proceedings of the 50th Hawaii International Conference on System Sciences.

13[] LENTA.RU. (June 25, 2014). Dial-a-drone! Syktyvkar pizzeria begins unmanned deliveries, https://www.rbth.com/news/2014/06/25/dial-a drone_syktyvkar_pizzeria_begins_unmanned_deliveries_37709.html

14[] Widener, M. N. (2016). Local Regulating of Drone Activity in Lower Airspace. BUJ Sci. & Tech. L., 22, 239.

15[] Reuters. (April 26,2016). Japan's Rakuten Demonstrates "First Commercial Drone Delivery Service in the World" http://toyokeizai.net/articles/-/115632

16[] Bamburry, D. (2015). Drones: Designed for product delivery. Design Management Review, 26(1), 40-48.

17[] Flirtey. (Nov 15, 2016). Flirtey Launches World's First Pizza-By-Drone Commercial Trials, Delivers Domino's Pizza to Customer Homes. https://www.prnewswire.com/news-releases/flirtey-launches-worlds-first-pizza-by-drone-commercial-trials-delivers-dominos-pizza-to-customer-homes-300363785.html

18[] Swiss Post. (Mar 31, 2017). Swiss Post drone to fly laboratory samples for Ticino hospitals Communication dated https://www.post.ch/en/about-us/company/media/press-releases/2017/swiss-post-drone-to-fly-laboratory-samples-for-ticino-hospitals

hospitals. In June 2017, Russia's largest savings and loan bank Sberbank [19], successfully test delivered cash from their cash handling center to a cash-in-transit van and the bank has plans to carry out it prior deliveries in Kazan, according to its deputy chairman, Stanislav Kuznetsov. The list is endless for all the companies in different countries which are already testing and others planning to.

Despite the struggle to develop the drone technology for commercial use, the negative impacts that emerge as a result of adaption of the technology have alarmed the authorities raising concern on a number of issues of which privacy and safety are the major pressing ones. Hence the need to answer some questions first; should the technology be permitted at all? Should the society permit the development of a technology likely to so threaten its privacy? Sociability is crucial when automating a social system and drone technology is no exception in order to negotiate and navigate crowded airspace [1].

If the development of the technology is unstoppable, then is it controllable with well-established regulatory framework where only authorized individuals or officials can use it for socially acceptable applications? [20] This paper aims at exploring the potential of delivery drones in Russia, examining issues that encompass aspects of receiving packages in a new way within established communities while putting much emphasis of the current legal frame work.

2.1 SWOT Analysis of drone technology

SWOT analysis focusing on the weaknesses and threats of the technology since that is what the regulators focus on as core issues while regulating.

2.1.1 Weaknesses

- Compete against human based
- Unclear system of delivery
- High startup and Unsure costs of asset maintenance including the

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19[] Sputniknews. (June 16, 2017). 'Big Day': Russia's Sberbank Successfully Tests Drone to Deliver Cash https://sputniknews.com/science/201706161054695960-russia-sberbank-drone/

20[]   Wright, D. (2014). Drones: Regulatory challenges to an incipient industry. Computer law and security report, 30(3), 226-229.

downtime for repairs [21]
- Flight regulations are limited
- Public availability; Drones created for criminal purposes
- Limited Altitude and distance
- Legal fees
- Limited payload
- Limited area of coverage

2.1.1 Threats

- Accidents, Collisions with passenger plane
- Lawsuits
- Society de-legitimization
- Unknown various costs, such as Licensing fees, taxes
- Restrictions from regulators [23]
- Research and Development funding is very constrained and limited [22]
- Hacking into software [23]
- Challenging weather conditions (winter, storm, strong wind, rain hence reducing navigation sight) always have a tendency to delay flights and operations [23]
- Theft of the aircraft
- Counter-measures against drones include:
◊   jamming of control signals and data transmission
◊   interference with geo-location data, such as the GPS data reaching the drone (BBC, 2012)
◊   ground based interdiction of the drone
◊   predator drones
◊   defensive drone swarms
◊   interference with the infrastructure on which remote pilots and facilities operators depend

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21[] Corey Rich, (2015). Unmanned Aerial Vehicles and the Future of Asset Management.

22[] Wong, K. C. (1997). Unmanned Aerial Vehicles (UAVs)-Are They Ready This Time. Are We.

23[] Kamkar, S. (2013). SkyJack: autonomous drone hacking. Online]. http://samy. pl/skyjack.

2.2 Table 1: PESTLE Analysis for drone technology

This analysis provides a basis to understand how the changing of these factors influences the development of the technology [24].

Political	Economical
• Government stability	• Fast, save time and resources • Employment creation • Increase in GDP • Automatization • Less consumer spending • Low production costs
Socio-cultural	**Technological**
• Negative perception by society (fear of the unknown). • Psychological image as weapons or intruders. • Public safety • Loss of jobs • Need of drone knowledge	• E-commerce (AliExpress, Avito.ru). • New innovations and discoveries • Expanded logistics network • Investment in Research and development (military purpose). • Reliability of the technology • Technology has hidden costs • Competition in R&D (research and development) is evolving quickly: new players are emerging every day. • Improvement of complementary technologies to address specific needs: planting trees, shipping things (books to pizza), sensors (for precision agriculture).
Environmental	**Legal**
• Eco-Friendly • Eco-taxes • Drones are also used for environmental purposes. • Harsh Russian climate (winter, strong winds and storm).	• Aviation laws • Privacy and Safety laws • Drones are not authorized in a lot of places. • Partnerships with governments are developing. • Legal applications are still work in progress in Russia. • Drones are observed in terms of size, payload, their power, and capabilities among other elements.

24[] Johnson, G., Scholes, K., & Whittington, R. (2008). Exploring corporate strategy: text & cases. Pearson Education.

Table 2: Other Applications of drone technology by Market Category

Asset Management	Aerial Surveying	Cinematography	Video Marketing	Other
Power line Inspections	Forestry Management	Movies	Real Estate	Fire Scene Inspections
Railway line inspections	Geophysical Surveys	Documentaries	Tourism Destinations	Insurance Claims
Oil Pipeline Inspections	Land Use Planning	News	Property Development	Crash Scenes
Wind Turbine Inspections	Mapping	Sporting Events	Commercials	Monitoring Marine Animals
				Agriculture
				Anti-Pirate Operations
				Border Controls
				Flood Documentation
				Research

Source: Unmanned aerial vehicles and the future of asset Management by Corey Rich 2015

Drone technology has a wide range of application of which some are still yet to be realized. The table above shows some of other applications of drone technology grouped in respective categories apart from delivery of packages or parcels.

3. Legitimation

There must be a social acceptance of an innovation by relevant actors [25]. The new technology "needs to be considered appropriate and desirable by relevant actors in order for resources to be mobilized, for demand to form, and for actors in the new technological innovation to acquire political

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25[] Randelli, F., & Rocchi, B. (2015). Analysing the role of consumers within Technological Innovation Systems towards sustainability: the case of Alternative Food Networks (No. wp2015_03. rdf). Universita'degli Studi di Firenze, Dipartimento di Scienze per l'Economia e l'Impresa.

strength" [26]. Companies can and are ready find ways to work through the technical limitations and the financials so as to achieve their desired goal of using drones for delivery. But what they cannot work around is legal framework on drones set by the regulators [27].

3.1 Regulatory framework

Some countries have highly restrictive regulatory frameworks whereas others are , some have are far less constraining, and some have very limited existing law s and regulations that affects drones and their operation and use.

There are several interrelating perspectives, and changes to achieve the intended ends, which may not be in a single dimension one problem and one solution. Legal regulators must understand the relationship between the interrelating perspectives prior to establishing new laws governing commercial drone operation.

3.1.1 Load delivery

There is need to define exactly what may and may not be delivered by a drone. Despite all the possible positive ways of using the technology, it can also be used for hostile load-delivery since it also offers prospects as a means of perpetrating violence, in a number of ways like:

• carriage of contraband [28] (like pistols, drugs, missiles)
• delivery of explosives and inflammable materials (bombs)
• use of the drone itself as a guided weapon (pilotless
• interdiction of other aircraft's flight paths (attack swarms)

Hence drone applications must be regulated and consequences clearly elaborated in case of violation.

3.1.2 Surveillance

26[] Bergek, A., Jacobsson, S., Carlsson, B., Lindmark, S., & Rickne, A. (2008). Analyzing the functional dynamics of technological innovation systems: A scheme of analysis. Research policy, 37(3), 407-429.

27[] Lotz, A. (2015). Drones in Logistics: A Feasible Future or a waste of effort.

28[] Matyszczyk C (2014b) Drone crashes trying to deliver drugs to jail. CNET. http://www.cnet.com/ news/drone-crashes-trying-to-deliver-drugs-to-jail/.

Surveillance and privacy; Drones carry video cameras to allow the remote pilot to fly them giving an opportunity to any individual engaging in persistent surveillance at the expense of others without even being detected by the person being invaded. [29]

So regulators must set boundaries from which drones are allowed to operate.

3.1.3 For whom

Government agencies like Law enforcement agencies, emergency services agencies, Media organizations, Communities, individual hobbyists, organized crime entities, and individual criminals too can use drones. Drone operations require expertise, skill and focus, and shortfalls against any of those requirements create risk of harm not only to the drone, but also to individuals and objects in its vicinity [31].

So regulators must set standards in terms of requirements that clearly state who is legible to operate drones and their limitations.

Table 3: Shows commercial drone laws and regulations in different countries against Russian laws

	Australia [1]	Canada [2]	UK [3]	China [4]	France[5]	USA [6]	Russia [7]
Regulatory body	Civil Aviation Safety Authority (CASA)	Transport Canada (TC)	Civil Aviation Authority (CAA)	Civil Aviation Administration of China (CAAC)	Directorate General for Civil Aviation (DGAC)	Federal Aviation Administration (FAA)	The Federal Air Transport Agency (FATA)
Maximum Height	-Controlled airspace - 120m / 400ft -Outside - No limit	Max. 300ft	Max. 120m / 400ft > 120m / 400ft approval required	Max. 120m / 400ft > 120m / 400ft approval required (CAAC)	Max. 150m / 492ft > 150m / 492ft approval required	121m / 400ft	Not specified
Maximum Take-Off Weight	< 2kg / 4.4lbs > 2kg / 4.4lbs	< 25kg / 55lbs > 25kg / 55lbs permission required	Not specified	0≤1.5kg, 1.5<4kg, 1.5<7kg, 7≤25kg, 15≤116kg, 25≤150kg >5,700kg (agricultural)	25kg / 55lbs	< 25kg / 55lbs > 25kg / 55lbs permission required	30kg / 66lbs

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29[] Clarke, R., & Moses, L. B. (2014). The regulation of civilian drones' impacts on public safety. Computer Law & Security Review, 30(3), 263-285, Table 2.

Beyond VLOS flights	Allowed for specific after "vigorous risk assessment"		Not allowed and drone must remain within 1640feet of pilot	Not allowed	Allowed with first person view	Not allowed	Not allowed
Compe-tence State-ment / License	< 2kg / 4.4 lbs = Registration required > 2kg /4.4lbs = Operators certificate + RPA required Commercial flight- 5 days notice.	>1kg ≤25kg Required (Urban)	>20kg-≤150kg CAA license required	<250 g/.55lbs -Real name registration >7kg/15lbs-<116kg (CAAC) license	Required	>0.55lbs Required	<30kg- Not required >30kg -Required
Night Times and bad weather	Special Approval	Not allowed	Special Approval	Special Approval	Special Approval	Special Approval	Not allowed and a watcher required
Labeling Require-ments	Not required but recom-mended	Not required	Not required but recom-mended	Not required	Not required	Required	Required
Air traffic control Notifica-tion	Required in controlled airspace	>4lbs -Required	> 15lbs -Required in controlled airspace	Required	Required in controlled airspace		Required
Drone Liability Insurance	Not required but recom-mended	Required, $100,000	Not required But highly recom-mended	Not required	Always required	Not required but recom-mended	Required
Pilot/ Operator certifi-cation	<4lbs None >4lbs Requires manufacturer conducted training course	Above 18 years of age -Ground school	Training (commercial)/ basic certificate for sUAS and ground school	<116kg, required	Knowledge of airspace restrictions	Above 16 years of age	Required
Yield way to manned flights	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Drone Ban Zones	-State institutes -Federal authority constructions -Regional authority constructions -Airport control zones (CTR) -Vehicles, Boats, Buildings, People Hospitals -Operation sites of police, military, search- and rescue forces	-State institutes -Federal authority constructions -Regional authority constructions -9km from Airport control zones (CTR) -Minimum 150m/500ft from crowds and 90m from built up areas hospitals -Operation sites of police, military, search and rescue forces	-State institutes -Federal authority constructions -Regional authority constructions -Airport control zones (CTR) -Minimum 150m/500ft from crowds and built up areas hospitals -Operation sites of police, military, search and rescue forces	-State institutes -Federal authority constructions -Regional authority constructions -Airport control zones (CTR) -Crowds of people Hospitals -Operation sites of police, military, search- and rescue forces *DJI drones-programmed not to take off in No-fly zones.	-State institutes -Federal authority constructions -Regional authority constructions Airport control zones (CTR) National Parks Crowds Private Property (only with permission of the owner) Hospitals -Operation sites of police, military, search- and rescue forces -Allowed only in; Unpopulated, Uninhabited, Populated and densely populated areas.	-State institutes; Washington -Federal authority constructions -Regional authority constructions -Airport control zones (CTR) -Crowds of people (not specified) Hospitals -Operation sites of police, military, search- and rescue forces	-State institutes; Moscow kremlin, Red Square -Federal authority constructions -Regional authority constructions -Airport control zones (CTR) -Crowds of people -military installations, power plants
Non-Compliance		Fines $5,000 -individual to $25,000 company -SFOC operators; $3,000 -individual /$15,000 company					Fines 3,000 rubles ($83)-individual to 500,000 rubles ($13,800) - legal entity.

From the table above, Russian drone laws are very much in line with rules in other countries, with only a few unique stand-out points:

- Drone operators must have a watcher at all times to monitor flight operations which is currently the most standing block which makes it almost impossible to use the technology for delivery.

- Air traffic control must be notified prior to flight with detail flight plan unlike other countries where it is only required in controlled airspaces only.

- Drone has to be labeled for the purpose of identification

There seems to be no mention of a specified maximum flight height, but with no doubt, that issue will be addressed and limits will be set.

5. Discussion

Packages are already soaring through the skies in other countries like Zipline in Rwanda dropping blood parcels on parachutes outside remote health centers with full support from the government and SF express in China while companies from different countries are testing restlessly to launch drone delivery services in their respective countries. Moreover in May 2017, JD.com Inc. China's biggest online retailer announced plans to develop one-ton delivery drones or more for long-distance deliveries by 2020 whereas in most of other developed countries like Russia, drone delivery has yet been permitted at all. Hence showing that china's advancement in drone delivery is way beyond as compared to any other country [30]. Drone delivery is currently restricted to only take place in rural and less populated areas in all the countries that permit it as a safety precaution but also a step forward to fully permitting it.

Conclusion

Customer demand and general interest in the technology is growing very fast in spite of a still emerging and uncertain regulatory framework with limited evidence available regarding the impact of drone technology for routine delivery. Determining whether drone technology would be beneficial to last mile is difficult without legal regulations permitting its usage in the logistics chain.

Drone delivery in Russia is yet to be realized and there have been only two official drone tests. Russia is using a strategy of monitoring and studying how other developed countries are handling this technology and then expound on their policies and adopt them as a way of avoiding and minimizing the risks involved since drone technology challenges the existing regulatory system, safety and privacy of Russian citizens, security of the entire Russian Federation, and creates the uncertain landscape for new business models.

30[] Shoshanna Delventhal. (May 23, 2017). JD.com Plans Drone Capable of Delivering One Ton by 2020. http://www.investopedia.com/news/jdcom-plans-drone-capable-delivering-one-ton-2020/#ixzz4xllBa0P5.

Sberbank's break through on delivery using drones; will have a big impact in determination of the future of drone technology in logistics sector in Russia. Whether or not Sberbank's project is successful, new regulations regarding the use of drone for delivery have to be drafted. The technical and safety obstacles to flying delivery drones can be overcome. But it is a gradual process involving "lots of data and demonstration" [29] to satisfy regulators. There needs to occur more drone tests by more large companies in Russia like in America as a way of putting pressure on the legal regulators to finding a neutral point of permitting the use of the technology. Drones may ultimately be used to deliver a series of various items ranging from money to carrying network antennas as Facebook's Zark anticipates. 2021 might witness drone deliveries in the last mile as customers order goods online from global sites like Ali express, amazon, Ebay, in cooperation with DHL, Postal.ru, Russian mail and also Fast food deliveries like pizza and deliveries of clothes from local stores to their door step.

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ASSESSING THE EFFECT OF E-GOVERNMENT INITIATIVES ON BUSINESS ACTIVITIES

Abstract:
Quality public service delivery in today's modern era of businesses springing up all around the globe is essential to business development and success. Governments are realizing the benefit of implementing e-Government initiatives in order to reduce administrative burden on corporations as well as SMEs and entrepreneurs. By providing e-registration, e-procurement and e-taxation portals for firms to carry out their various business processes.
This study by adopting univariate simple correlation, granger-causality and Bayesian networks analyzes the top three and bottom three performing countries from the United Nations' e-Government 2016 survey and their respective World Bank Doing Business 2016 indicators, i.e. Starting a Business and Paying Taxes, to assess the relationship. Thus proving that e-Government implementations are pertinent to successful business processes precisely starting a business and paying of taxes.

Keywords:
e-Government, Doing Business, Public Sector Innovation, Impact Assessment.

Introduction

The value of integrating Information Communication Technology (ICT) in government and public services in this modern digital era is evident across the world, especially in developed economies. E-Government is defined by Fountain [1] as the production and delivery of information and services inside government and between government as well as the public using a range of information and communication technologies. Thus utilizing ICT in offering quality public services to its citizens with the goal of improving their livelihood.

Based on the proposed benefits by numerous researchers that e-government implementation is a potential for reducing administrative cost burden in government. From starting one's business to paying of taxes, e-government is capable of reducing bureaucratic process in public services as a result of the measures which are put in place by the system [2][3][4][5].

For the purpose of this study, the context of business and business activities is with respect to starting a business and paying taxes. The rest of this paper is structured as follows. In section two, e-government and the e-Government Development Index (EGDI), the Doing Business indicators pertinent to this study (Starting a Business and Paying Taxes) are reviewed. Section three discusses the data and methodology used in ascertaining the proposition. In section four, entails the discussion of results and findings of the analysis and section five concludes and discusses key contributions of this study to e-government impact assessment literature.

Literature Review

e-Government Development Index

The purpose of e-government calls for rethinking ways the government functions are carried out today in order to improve processes and integration aside the conversion of traditional information into bits and bytes (digitizing) and making it reachable via the internet websites or giving government officials computers or automating old practices to an electronic platform [2]. In their bid to integrate ICT into the public sector so as to offer quality service delivery, governments take into consideration the deficiencies in the system and formulate the necessary framework (i.e. policies, development and execution plans) to yield maximum utility. As

outlined by Hanna [6] and Berntzen [4], e-government improves investment climate and competitiveness; improves governance, transparency and accountability; improves efficiency and resource management; improves access and quality of public services; provides more inclusive public services; increases users' value and satisfaction; improves policy making and enhances citizen participation. EGDI ranges between 0 and 1.

The United Nation since 2005 till date set out on the path of measuring the efficiency with which governments across the world continue to assess e-government development at the national level and is a composite index based on the weighted average of three normalized indices; One-third is derived from a Telecommunications Infrastructure Index (TII) based on data provided by the International Telecommunications Union (ITU), one third from a Human Capital Index (HCI) based on data provided by the United Nations Educational, Scientific and Cultural Organization (UNESCO), and one third from the Online Service Index (OSI) based on data collected from an independent survey questionnaire that assesses the national online presence of all 193 United Nations Member States [5]. The EGDI is beneficial in;

- Measuring the readiness and capacity of national administrations to use ICT to deliver public services;

- Gaining a deeper understanding of the relative position of a country in utilizing e-government for the delivery of public services.

Starting a Business and Paying Taxes

As stated by the UNDESA [5] report, "regarding sectorial and transactional services, more countries have introduced online services for tax submission and registration of businesses, thus reducing the administrative burden for new and existing businesses and increasing transparency". The need for public sector reform is evident in the increasing endeavour with respect to digital literacy and bridging the digital divide, the proliferation of social media and ubiquitous computing, as well a vast adoption of electronic commerce in today's world. In order to streamline and simplify the business registration and tax compliance processes, governments, within the past decade began to introduce comprehensive tax and business registration reforms.

The Impact of e-Government on Business

A study by Choi et al. [7] on e-government in assessing government capacity concluded that the role of e-government proved more crucial for human development than the role of policies and institutions and as such e-government plays a vital role in supporting the citizen livelihood. To achieve this, successful countries such as Estonia turned to a more user-centric perspective where the citizen is the main focus of designing any public sector implementation. According to Almeida & Zouain [8], improvements in e-government and its indexes can explain the change of positions of a given country in Ease of Doing Business and in Total early-stage entrepreneurial activity which includes business registration activities and taxation. They also indicated that the human capital is the most effective way to improve a country's business atmosphere, without considering the country's income level. Thus, e-government plays a key role in improving upon human development which in turn creates a conducive environment for successful business activities.

Hence, submitting tax returns online from anywhere on-the-go, including historical data retrieval, e-government impacts businesses in the following ways;

Aside saving businesses time (since it has been reported that contributions which are paid in person involves delays), electronic filing also helps prevent human errors in tax returns. For example, Peru's online tax payment system is credited with significantly increasing the efficiency of tax administration because it identifies and automatically rejects incomplete returns, reducing the number of returns that require verification and correction [6].

By increasing transparency, electronic filing limits opportunities for corruption and bribery [5].

Provides business support services for SMEs and facilitate access to finance [6].

According to the World Bank Doing Business 2016 report, an in-depth look at a number of countries whose e-government implementations have positively influenced the business landscape and reduced bureaucratic constraints reveals that;

The introduction and improvement of online procedures in South Africa have eased barriers to start-up.

The creation of one-stop-shop services and their improvement for public services in Niger and Egypt.

Also, in the light of similar reforms with respect to tax compliance, the introduction and improvement of tax declaration and returns systems in Albania, Japan and Uruguay have simplified taxation processes.

Data and Methodology

Data

In order to achieve the desired goal, this study utilized secondary data comprising of the Paying Taxes and Starting a Business indicators from the World Bank's Doing Business 2016 Report. The 'Paying Taxes' indicator records the taxes and mandatory contributions that a medium-size company must pay or withhold in a given year, as well as measures the administrative burden in paying taxes and contributions [9]. Whiles, the 'Starting a Business' measures the paid-in minimum capital requirement, number of procedures, time and cost for a small- to medium-sized limited liability company to start up and formally operate in economy's largest business city [9].The distance to frontier (DTF) for both indicators is incorporated into the study and this score aids in assessing the absolute level of regulatory performance and how it improves over time. This measure shows the distance of each economy to the "frontier" which represents the best performance observed on each of the indicators across all economies in the Doing Business sample since 2005 [9].

For analysing e-Government development, the United Nations' 2016 E-Government Survey Report was made use of.

Methodology

The study utilizes the simple univariate linear regression model [10] to study the relationship between the dependent variables Y; Paying Taxes indicator (Y1) and Starting a Business indicator (Y2).

The independent variable X; the E-Government Development Index (EGDI) comprised of 30 observations which represent the top three and bottom three performing countries in the continents; Africa, Americas, Asia, Europe and Oceania but eventually Cuba was eliminated because the World Bank's doing business indicators were unavailable. Thus 29 observations in total. The lmtest and zoo R-packages were used in achieving the univariate simple linear regression and also in measuring the correlation between both Doing Business Indicators and EGDI. Table 1 below represents the collective data for the analysis purposes. The countries with the top three EGDI in each region are shaded.

To support the proposition of the research, a Bayesian Network [11] implemented in *bnlearn* R-package. Also, the Granger Causality test [12] was used in supporting the correlation results.

All analysis were performed with the R programming language using the R-Studio IDE.

Table 1 - Representation of Countries Grouped into Continents and their respective EGDI, Starting a Business indicator and Paying Tax indicator.

Continent	Country	EGDI	Starting a Business (DTF)	Paying Taxes (DTF)
Africa	Mauritius	0.6231	91.65	82.96
	Tunisia	0.5682	85.01	68.96
	South Africa	0.5546	80.47	81.09
	Guinea	0.1226	80.2	24.28
	Niger	0.0593	86.16	50.19
	Chad	0.1256	51.91	18.76
AMERICAS	United States of America (USA)	0.842	91.23	83.85
	Canada	0.8285	98.23	88.86
	Uruguay	0.7237	89.79	66.08
	Honduras	0.3611	77.02	54.97
	Guyana	0.3651	85.45	59.27

ASIA	Republic of Korea	0.8915	95.83	86.56
	Singapore	0.8828	96.49	91.85
	Japan	0.844	86.09	77.03
	Myanmar	0.2362	77.1	64.05
	Afghanistan	0.2313	92.08	51.29
	Yemen	0.2248	71.59	71.64
EUROPE	United Kingdom	0.9193	94.58	90.74
	Finland	0.8817	93.13	90.23
	Sweden	0.8704	94.64	85.28
	Romania	0.5611	89.48	81.64
	Albania	0.5331	91.73	70.96
	Bosnia and Herzegovina	0.5118	65.09	60.08
OCEANIA	Australia	0.9143	96.47	85.6
	New Zealand	0.8653	99.96	90.71
	Fiji	0.4989	73.13	67.55
	Vanuatu	0.3078	81.24	80.6
	Solomon Islands	0.2406	85.48	83.58
	Kiribati	0.3122	78.17	75.08

Results and Discussion

The result of this study contributes to the identification of relationship between e-Government and doing business, particularly starting a business and paying taxes. The hypotheses for the test are as follows:

H_1:EGDI has an effect on Starting a Business (DTF)
H_2:EGDI has an effect on Paying Taxes (DTF)
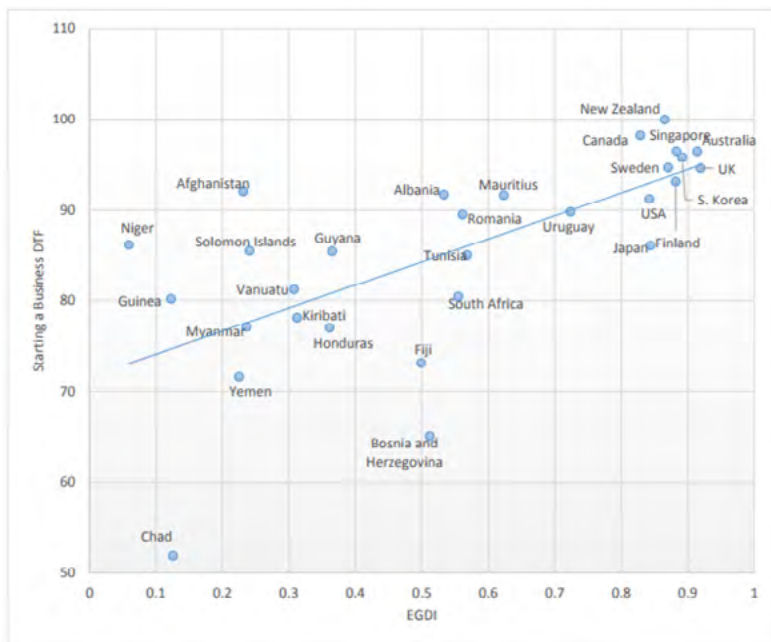
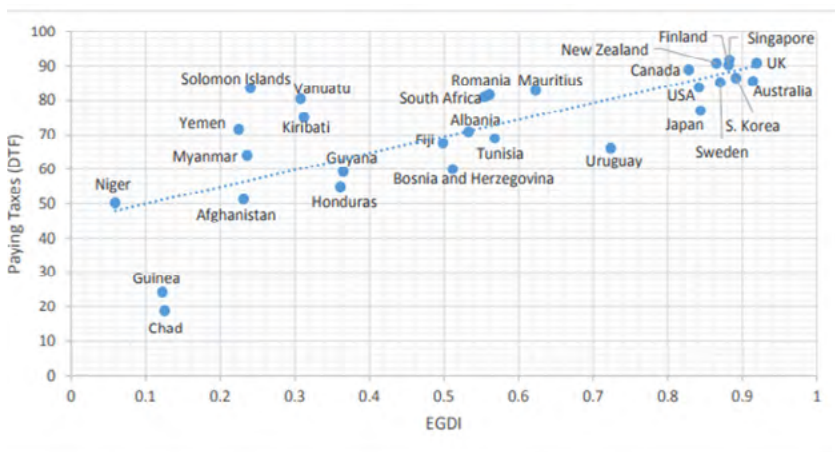Figure 1. Scatter Distribution of Starting a Business (DTF) and EGDI for 2016

Figure 2 - Scatter Distribution of Paying Taxes (DTF) and EGDI for 2016

Figures 1 and 2 illustrates the graphically relationship between starting a business DTF and EGDI of the selected countries as well as paying taxes DTF respectively. It is evident that the topmost performers from the distribution are all developed economies as well as technologically advanced economies.

Granger Causality Test

Upon performing the for EGDI granger-causes 'Starting a Business (DTF)', the significant p-value of 0.004393 which rejects the null hypothesis that EGDI does not have an effect on the 'Starting a Business' (DTF) indicator which is a subset of Doing Business Index.

Likewise, the test for EGDI granger-causes 'Paying Taxes (DTF)', a significant p-value of 7.09e-05 rejects the null hypothesis that EGDI does not have an effect on the 'Paying Taxes' (DTF) indicator which is a subset of Doing Business Index.

Correlation Test

The first Pearson's correlation test revealed a strong positive linear relationship between Starting a Business and EGDI [(Starting a business ~ EGDI) = 0.6696966] with a significant p-value < 2e-16, indicating a strong correlation.

Similarly, the Pearson's correlation test for a relationship between Paying Taxes and EGDI [(Paying Taxes ~ EGDI) = 0.7511665] revealed a strong positive linear relationship as well as a significant p-value of 2.66e-06.

Hence, it is clearly evident in both cases that improvement in a country's public service delivery yields maximum benefit in both starting a business and paying of taxes.

Bayesian Network

Figure 3 is a Bayesian network which represents the causal chain and confirms the hypothesis H_1 that node EGDI causes node 'Starting a Business (DTF)'.

Figure 4 likewise represents a Bayesian network which is also a causal chain and confirms the hypothesis H_2 that node EGDI causes node 'Paying Taxes (DTF)'.
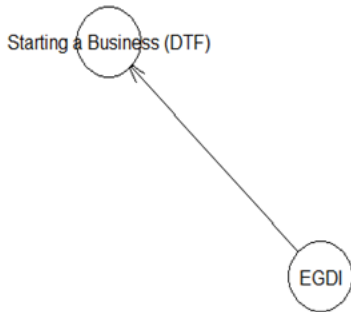
Figure 3 - Bayesian network of EGDI has
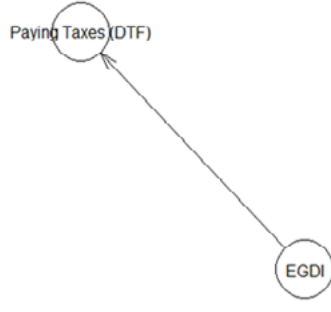an impact Starting a Business (DTF)

Figure 4 - Bayesian network of EGDI
has an impact Paying Taxes (DTF)

The model represented by the graph in figure 3 assumes that the joint probability can be factored by: P **(EGDI, Starting a Business (DTF)) = P(EGDI) P(Starting a Business (DTF)| EGDI)**. For figure 4, the model represented assumes that the joint probability can be factored by; **P(EGDI, Paying Taxes (DTF))= P(EGDI) P(Paying Taxes (DTF) | EGDI)**.

Thereby both networks are supporting proof to the propositions made in H_1 and H_2.

Conclusion

In conclusion, the study aimed at establishing both correlation and causation From the findings, it is evident that the adoption of quality citizen-centric e-government solutions is capable of boosting economic activity as a result of the ease with which business activities are carried out. Due to the fact that positive human development is a product of quality public service delivery which in turn eases administrative burden on SMEs and huge corporations. Hence, e-government leads to improved business processes at the public sector, i.e. Government-to-Business (G2B) and Business-to-Business (B2B).

Governments, especially developing economies need to adopt quality e-government in their bid to fight corruption and reduce bureaucracy not only in starting businesses and paying taxes, but every other public sector where citizens transact with. Eventually, e-Government positively impacts business process between citizens and their government.

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MACHINE LEARNING METHODS IN INDIVIDUAL MIGRATION BEHAVIOR[31]

Abstract:
Machine learning is described as "a field of computer science that gives a machine the ability to learn". In fact, machine learning is considered as a sub branch of Artificial Intelligence(AI). In recent years the rise of big data and cloud computing gives AI expert and specifically machine learning expert to dive deeply in data and extract knowledge from it by using machine learning algorithms. In this paper we try to introduce the basic concepts of machine learning algorithms including supervised learning, unsupervised learning and reinforcement learning and its usage in different applications. We describe specifically how to use machine learning in migration process modeling and focus on an approach for migration description, that is based on one of machine learning methods, the decision tree algorithm. We apply this method for the description of the economic behavior of an individual in the question of continuing his work in Russia based on the panel data and the data from the sociological survey. The accuracy of our estimation using decision tree

is 67 percent for this specific task. All in all, the main objective of this paper is to introduce the important aspects of machine learning and its usages in the state-of-the-art technologies.

Keywords:
artificial intelligence, machine learning, supervised learning, unsupervised learning, reinforcement learning, migration process, labor migration, economic behavior

Introduction

Machine learning is a field of computer science that gives machines the ability to learn without being explicitly programmed. Machine learning is an application that is fed by data as the input and gives up knowledge as the output. By this definition we can imply that it plays an important role in a world which is comprised of extremely large structured and unstructured data (so called Big Data). If we look at the world, we are living in, a little bit deeper we can see that data almost touches every aspect of our lives, from the way we transact commerce on the web, to how we measure our fitness and safety, to the way doctors treat our illnesses, to economic decisions that affect entire nations. Scientific fields are transitioning from data-poor to data-rich and across industries, science, and government-methods for making decisions are becoming more data-driven as large amounts of data are being harvested and stored. The first challenge anybody finds when starting to understand how to build intelligent machines is how to mimic human behavior in many ways or, to put it even more appropriately, how to do things even better and more efficiently than humans. In order to build an intelligent machine, we need to be familiar with some tasks which I think are closely integrated with each other.

Machine learning methods

Statistics, the science, which deals with learning from data and measuring, controlling, and communicating uncertainty, is the most mature of the data sciences. Over the last two centuries, and particularly the last 30 years with the ability to do large-scale computing, this discipline has been an essential part of the social, natural, biomedical, and physical sciences, engineering, and business analytics, among others. Statistical thinking not only helps make scientific discoveries, but it quantifies the reliability,

reproducibility and general uncertainty associated with these discoveries. Because one can easily be fooled by complicated biases and patterns arising by chance, and because statistics has matured around making discoveries from data, statistical thinking will be integral to Big Data challenges [3].

Tom Mitchell in his paper The Discipline of Machine Learning defined the fundamental question as "How can we build computer systems that automatically improve with experience, and what are the fundamental laws that govern all learning processes?" He further explains, "To be more precise, we say that a machine learns with respect to a particular task T, performance metric P, and type of experience E, if the system reliably improves its performance P at task T, following experience E." He also illustrates that, the definition of computer science is "How can we build machines that solve problems, and which problems are inherently tractable/intractable?" whereas Statistics is "What can be inferred from data plus a set of modeling assumptions, with what reliability?" Having asked these questions, we can clearly see the difference between machine learning and statistics. Another line of thought, in the paper "Statistical Modeling: The Two Cultures" by Leo Breiman in 2001 [4], argued that statisticians rely too heavily on data modeling, and that machine learning techniques are instead focusing on the predictive accuracy of models.

John McCarthy, a well-known American computer scientist in the field of *Artificial Intelligence* (AI) in his paper *What is Artificial Intelligence defines* "AI is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable" [5]. He also makes a list of different branches of AI including logical AI, search AI, pattern recognition, representation, inference, common sense knowledge and reasoning, learning from experience, planning, epistemology, ontology, heuristics, genetic programming. It should be pointed out that machine learning is also a subset of AI.
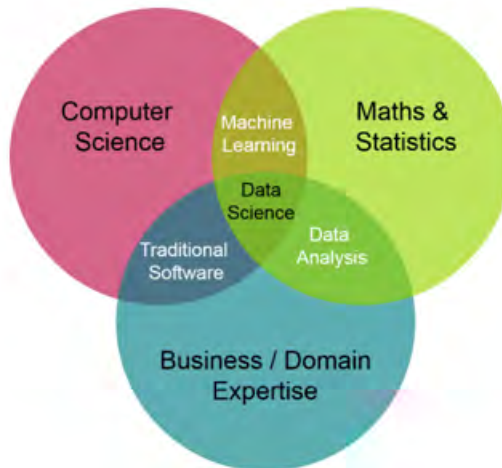
Figure 1: Data science toolbox

In *Data Mining Concepts and Techniques 2nd edition published by Jiawei Han and Micheline Kamber* book [6], data mining is "extracting or mining knowledge from large amounts of data." By considering this definition, we can obviously see that there is a strong correlation between data mining and machine learning. We can see that machine learning is used at the heart of data mining.

Data Science is a big umbrella that brought everything that we need in order to extract data and show insight from data. Data science employs many fields including: mathematics, statistics, machine learning, business, communication science and computer science. Figure 1 can be a sample of a toolbox that is being prepared by data science for us.

Different Types of Machine Learning Algorithms

Supervised Learning

This algorithm consists of dependent variable (so called target variable) and a set of independent variables (so called predictors). The algorithm uses independent variables to generate a function in order to predict the dependent variable.

Common supervised machine learning included: [7]

- Predictive analysis based on regression or categorical classification
- Spam detection
- Pattern detection
- Natural Language Processing
- Sentiment analysis
- Automatic image classification
- Automatic sequence processing (for example: music or speech)

Unsupervised Learning

In this type of machine learning algorithm, we do not have any dependent variables. In fact, we use it for clustering our data in different categories.

Common unsupervised applications include: [7]

- Object segmentation (for example: users, products, movies, songs and so on)
- Similarity detection
- Automatic Labeling

Reinforcement Learning

In this algorithm, the agent is exposed into an environment and it learns from the environment. According to its behavior it gets a feedback which is usually called reward in case it is positive and if it is negative it gets a penalty and it is useful to know that a specific action performed in an environment is positive or negative.

There is a very informative description of reinforcement-learning model in the paper Reinforcement Learning: A survey published on Journal of Artificial Intelligence Research in 1996 [8], "In the standard reinforcement-learning model, an agent is connected to its environment via perception and action. On each step of interaction, the agent receives as input, i, some indication of the current state, s, of the environment; the agent then chooses an action, a, to generate as output. The action changes the state of the environment, and the value of this state transition is communicated to the agent through a scalar reinforcement signal, r. The agent's behavior, B, should choose actions that tend to increase the long-run sum of values of the reinforcement signal. It can learn to do this over time by

systematic trial and error, guided by a wide variety of algorithms".

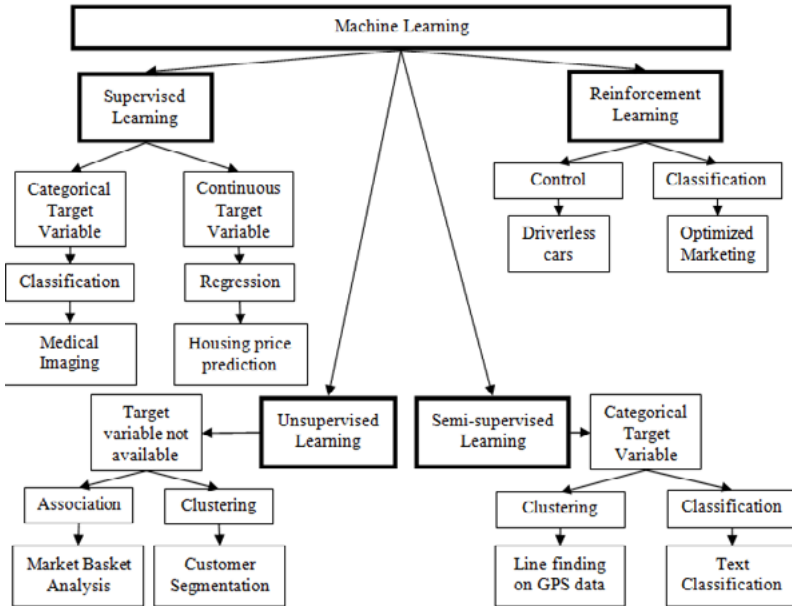Figure 2 shows the different types of machine learning.

Figure 2: Machine Learning types

Top Machine Learning Use Cases

Bernard Marr wrote an article in Forbes(an American business magazine) in 2016 about the top AI and Machin machine learning Use case that are briefly summarized below.

In 2014, Kaspersky Lab said it had detected 325,000 new malware files every day. But institutional intelligent company Deep Instinct says that only between 2% to 10% of the files change. Machine learning can look for pattern and report anomalies that could predict Data Security breaches [9].

It's a huge opportunity for businessmen if they are capable of predicting the stock market and Financial Trading. Many prestigious trading firms use machine learning to predict and execute trades at high speed and high volume [9].

Computer-aided diagnosis (CAD) can help radiologists find early-stage problems. One study used computer assisted diagnosis (CAD) when to review the early mammography scans of women who later developed breast cancer, and the computer spotted 52% of the cancers as much as a year before the women were officially diagnosed. Additionally, machine learning can be used to understand risk factors for disease in large populations [9].

The more you know about your customers, the better you can serve them. That is the foundation behind Marketing Personalization. Companies can personalize which emails a customer receives, which direct mailings or coupons, which offers they see, which products show up as "recommended" and so on, all designed to lead the consumer more reliably towards a sale [9].

Machine learning is getting better and better at spotting potential cases of Fraud Detection across many different fields. PayPal, for example, is using machine learning to fight money laundering. The company has tools that compare millions of transactions and can precisely distinguish between legitimate and fraudulent transactions between buyers and sellers [9].

The best example of utilizing machine learning is this area is Amazon. When you want to buy a book, Amazon automatically choose other books that is closely related to the books you want to buy. YouTube also has the same strategy when you watch a video clip.

Perhaps the most famous use of machine learning, Google and its competitors are constantly improving what the online search engine understands.

Machine translation using Natural Language Processing (NLP) helps us conquer language barriers that we often encounter by translating.

Automatic summarization for summarizing the meaning of documents and information, it also used to understand the emotional meanings inside the information.

Sentiment Analysis is used to identity how positive or negative people think or feel about different products or services.

Text classification helps us to classify text. An example of text classification is spam filtering in email.

Machine Learning in Migration Process Modelling

It is necessary to highlight, that socio-economic factors causing and determining the migration processes, are usually interconnected. According to the new theory of migration it is also necessary to take into account the earnings level of migrant's environment when describing the decision on migration [10]. Among the various factors, the wage difference between sending and receiving countries is the main economic factor. The neoclassical economic theory of migration is provided with migration models in which immigrant workers respond to the main economical factors, such as cross-region difference in salaries levels, migration costs and the labour market situation in the countries of origin and destination [11]. The standard theory of equilibrium which states that the uncontrollable inflow of foreign labour to a country reduces the relative wage of local workers because of the raising level of competition between migrants. The human capital model takes into account such migration factors as a fully rational decision on migration depending on the wage gap or the fact of perfect competition on the local labour market. Migration networks help disseminate information about the conditions of life and the labour market situation in different countries and help in finding employment for involved into these networks migrant workers. As a result, the migratory redistribution helps in regulating wages and stabilize the global labour market in two ways [12]: directly, through the reduction of supply of the labour market of the country with excessive labour resources and the increase of supply in the country lacking labour resources, and indirectly through international money transfers made by migrants [13].

One of the goals of our research was to estimate migrants behavior in the hosting country and to analyze their decisions on continuing their work as a migrant employee. In this paper we use an approach for migration description, that is based on machine learning methods, in particular the decision tree and the k-nearest neighbour methods. In the age of modern technology, there is a large amount of structured and unstructured amount of data. Machine learning evolved as a subfield of Artificial Intelligence that involved self-driving algorithms that derive knowledge from data in order to make prediction. Instead of requiring humans to manually derive rules and build models from analyzing large amounts of data machine learning offers a more efficient way for capturing the knowledge in data to gradually improve the performance of predictive models and make data-driven decisions. This is to do with what type of response variable we have in the training data. In our work we used an approach for migration description, that is based on machine learning methods, in particular

the decision tree and the k-nearest neighbour methods. The best accuracy of estimation during our work was observed when using the decision tree method (Table 1). According to our approach 8 percent of migrants wish to stay for work in Russia for additional three months, 35 percent for an additional year and 57 percent wish to stay for a time period from one to three years, which can be explained by a high attractiveness of well developed labour markets for migrants.

Table 1. Comparison of different prediction models

Prediction Model Used	Application	Evaluation Measure
K-Nearest Neighbour	Immigration	Accuracy = 58.13%
Decision Tree	Immigration	Accuracy = 67.44%

The wage gap between Russia and CIS countries will diminish, while the wages in the Moscow region will go downward. This tendency however may call for attention to the negative effects on wages and employment due to immigration, where the arguments are that immigrants may compete in labour markets with native-born workers, thus displacing native-born workers, or causing real wages for native-born workers to be pushed down. These preliminary results need deeper analysis to ascertain the migration impact on both the sending and hosting economies, including dimensions of wage, unemployment, and labour productivity [14].

Conclusion

The complexity of migration processes comes from the interaction of economic, demographic, and other social factors, which co-determine the size, age structure, and skill level of migration flows from sending to receiving countries. The analytical tools are needed to simulate the dynamics of the migration processes in a holistic context.

It is necessary to highlight that the methods of machine learning are very good fitting when describing the variants of system's development based on a big statistic dataset. When modelling the overall migration system for a country it is necessary to combine the machine learning, the agent based models and the dynamic models of migration based on the game theory assumptions. According to our results the main share of migrants prefers to stay for work in the country of destination so long, as possible, which is explained by growing migration costs and the bigger possibility of finding a job when staying inside of the developed labor market.

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FUZZY LOGIC IN THE SYSTEM ARCHITECTURE OF EDUCATIONAL PROCESSES ANALYSIS

Abstract:
In our work we analyze a set of economic factors, that impacts on student's decision of educational path change. Taking into account such factors as the expected salary after graduation, educational costs, set of government exams and the amount of educational paths in the university, we estimate the possibility for each student to optimize his educational path. To describe the behavior of a rational individual and to estimate the optimal and preferred educational paths in this conditions we use the classical economic theory, the classical theory of economic behavior, the methodology of increasing efficiency of the human capital and the institutional economic theory. To estimate the possibility for each student to change his educational path we developed an approach, that is based on the fuzzy logic model of Mamdani type. According to this approach, the possibility of educational path change for a student is calculated on the panel data on the amount of perspective directions of student's graduation and educational paths, on the possibility of budget support of the graduation, on the expected salary level after graduation.

Introduction

The optimal use of university's resources in this competition requires comprehensive analysis of the student's motivational factors and a deep analysis of financial effectiveness and energy efficiency in the organization of higher education. In this article we focus our research on the problem of educational process optimization, depending on the labor market demand and the student's expectancies. The choice of a university and an educational trajectory determines student's current and future personal well-being. At the same time, the choice of an educational path made by each student impacts on the further development of economic sectors. In this article we analyze student's economic motivation in the context of individual behavior theory.

According to the classical theory of individual economic behavior, decisions are based on the considerations of clear rationality. It is assumed that individuals choose the best way to maximize the utility of the obtained benefits or to search a job with the best possible future income. Along with this, it is understood that people are able to evaluate all the possible choices and understand the consequences of each option [1].

Behavioral economists assume that people react differently to equivalent situations depending on their own estimates, whether they lose or win. Pursuant to the classical theory of individual economic behavior, decisions of rational individuals are based on the considerations of clear rationality [2]. Individuals choose the best way to maximize the benefits obtained or search a job with the best possible future salary level. In terms of the theory of modern institutional economics we assume that the economic behavior of the individual is largely determined by the limitations of the institutions [3].

Modern Institutional Economics Theory argues that the economic behavior of the individual is largely determined by the constraints imposed by institutions [4, 5]. The study of economics of higher education [6] and, in particular, the economic analysis of the preferences is seen as an urgent task of researchers. Several mathematical models have been developed based on an analysis of the career choice [7, 8].

The study of economics of higher education and, in particular, the economic analysis of the preferences, is seen as an urgent task of researchers. Questions of student's economic expectations and university's entrants are widely discussed by contemporary economists. In particular, the dependence of the expected incomes after the graduation on different specialties is under investigation [9]. The state of the Russian higher education provides extensive statistic data to analyze the impact of economic incentives on human behavior. In short, the situation can be characterized following sentences: the government creates incentives for learning technical and natural sciences by providing a wide spectrum of tuition subsidies and state scholarships; the state and independent experts report about the "overproduction" of the humanities graduates (economists, students of law, managers); young people show a preference for a liberal arts education [10, 11], despite a lack of available scholarships [12, 13]; the system of the Unified State Examination (the USE) allows to formalize and to analyze the "set of opportunities" for university applicants in the search of a major.

To establish the probability of a student changing of educational path, a fuzzy logic model of Mamdani type [14] was developed according to the following parameters. 3 input rules converge into establishing the output variable of probability of change. In this way the number of possible perspective directions [15] are the first variable that affect in the decision of a student changing of program, the second variable is the probability that these students have to get budget support from the government or university to pay for their studies, and lastly the last variable is an estimate of the amount of money the students will earn as a salary when they graduate from their current program. The following step to the model is to establish the ranges that can represent through natural languages each one of the variables of the model.

The Educational Processes Analysis System

The Educational Processes Analysis System (EPAS) (figure 1) is an architecture design aimed to be used as a reference for educational institutions. Its main functionality is to provide a set of analyses and reports that can be programmed through some business rules in natural language, that depending of some input variable inputs can generate some output variables.

The core of the whole EPAS architecture is based on using Fuzzy Logic, more specifically Fuzzy Inferences Systems, which can be used in a wide

range of fields, due to their outstanding ability of managing natural language variables (known for having vague ranges). For the specific scenario of the EPAS architecture, the fuzzy inference system or set of systems have the purpose of create indicators or variables of study that can facilitate the labor of analysis of Educational Factors that influence a student. One specific example is an indicator that expresses the Probability of Program Change according to factors like the possible Future Salary, the Amount of Programs Available to Change of Educational Path and finally the Probability of Getting Monetary Support or Aid.

In a normal scenario the process would involve first taking into account the different variables to create a custom model according to the needs of each educational institution, then creating the model, and lastly adjusting the model (modifying formulas) to full fill the analysis requirements, but through the implementation of an EPAS architecture educational institutes can make use of computational power to focus the efforts entirely into defining solely the business rules, which express in natural language the way the input variables relate between themselves to determine the out variable [16].
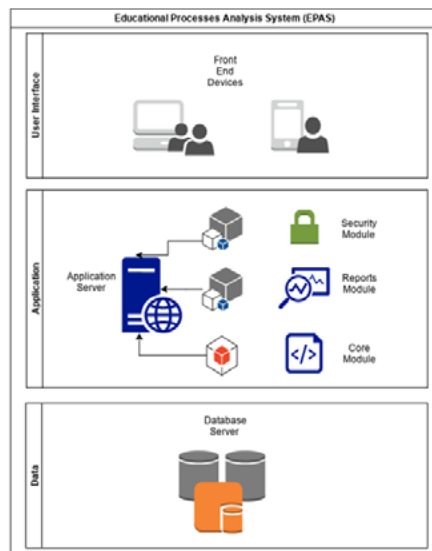

Figure 1: Structure of the Educational Processes Analysis System (EPAS)

The Model Architecture

The architecture per se it's a three-tier architecture (widely used in the IT industry) divided into three main layers: Data Layer, Application Layer and User Interface Layer. The purpose of this architecture is to divide one problem into the previously mention layers in order to decrease the dependence of the system components. To present a more concise example applicable in the EPAS context, educational institutions that implement an EPAS architecture can easily upgrade, maintain, or modify each layer of the system. More over if for instance two institutions decide to build an EPAS in a collaborative effort, they can implement the same system and just focus on change the User Interface Layer for specific branding or customized graphical features, without worrying of affecting neither the Application or Data Layer (figure 2).

The Data Layer is aimed to provide the EPAS the input data required to analyze the educational processes of the students in an educational institute, therefore it must contain the variables that are going to be used in the business rules of the Application Layer. It is important to mention that when a system is poorly design, in terms of programming a system without taking into account the expected outputs, mostly like it will not offer a useful help, if given any at all. Another function delegated to Data Layer is to serve as a register of historical data, providing reports and raw data that can be used in the future for further and deeper analyses that may involve prediction rules. Also this layer has the responsibility of store business rules for one or more processes of analysis used in the Application Layer.
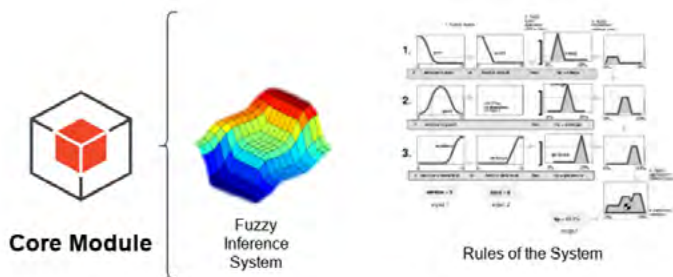

Figure 2: Model Architecture

The Application Layer is the core of the whole EPAS concept, within this layer can be found the heart of technology processes that will support educational institutions on the understanding and decision making regarding the educational processes of the students. There are three independent modules that should exist in this Layer in order to provide a minimum set of required characteristics. The Core Module provides the EPAS the ability to take larger amount of stored data in the Data Layer and process them according to fuzzy sets to generate some output variable. The processing here can be implemented in different ways, but it is suggested to use programming libraries that offer Fuzzy Logic Support for creation Fuzzy Inference Systems rather than developing a custom library for dealing with this kind of problems [17].

The Reports Module is responsible for saving the output variables generated from the processing of the Core Module into the Database, and generate reports that can be read by humans in a more comprehensive way than just raw numbers. It is recommended that the reports can be generated in various formats (eg. PDF, EXCEL, CSV, etc.) for usability and usefulness of the system.

The Security Module is designed to ensure that the generation of reports, modification of business rules and restricted access to system is ensured. For instance, some university employees can have access to the system for viewing and generating reports but the modification of business rules or access to sensitive data itself must be restricted from them.

Finally the User Interface Layer is just a proxy between the functionality offered by the Application Layer and the Data Layer. This layer can be as small or big as desired since is completely independent of the other two Layers. For example, in this Layer three different applications could be found, a Desktop Application, a Web Application and a Mobile Application. All of this applications would have their own specifications and requirements according to the educational institutions needs but they could potentially offer the same functionality.

Conclusion

To conclude its necessary to rectify that this is not the only possible solution to implement fuzzy logic systems of inference into the analysis of educational processes, but it is certainly a well known standard that any

IT department or company could implement or maintain like any other web application for example. This architecture gives the chance to departments and companies of IT to build a solution conceptually equal to other market tools but taking the advantage of using fuzzy logic to analyze the input data of an educational institution for obtaining a valuable output and understanding of the educational processes.

The fuzzy logic model allows the describing of educational path change probability. At the same time on the basis of this model it is possible to analyze the impact of student's choice on the economic sectors development. The Educational Path change probability in the current model is varied between five levels and depends on the amount of perspective directions of graduation for students, on the budget support possibility for each student and on the expected salary level after graduation. For the further research we plan to extend the model by analyzing individual's social and personal characteristics.

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GREEN ECONOMY, GREEN ENERGY, GREEN INVESTMENT

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SUSTAINABLE DEVELOPMENT OF REGIONAL INFRASTRUCTURE SYSTEMS IN THE FACE of CLIMATE CHANGE

Abstract:
The functioning and sustainable development of infrastructure systems in the face of climate change are discussed. The review of foreign approaches to work systems in terms of adverse climatic factors is presented. The regional systems of water supply and sewage systems and their readiness to work in conditions associated with climate change are considered. The problems and obstacles of development for systems were identified. The use of innovative technologies, training staff and improving the quality of management

decisions were proposed as directions of improvement of system of water supply and sewage systems.

In recent decades, the term «sustainable development» has become widely used as the designation of one of the possible directions of the future path of human development. In foreign practice, the term «sustainable development» is most often used. The very notion of stability has found application for the survival of mankind in its environment. The concept of sustainability was put forward in the report of the World Commission on Environment and Development of the United Nations (WCED, Commission under the leadership of G.Kh. Brundtland) in 1987 as follows: «sustainable development - development that meets the needs of the present without compromising the ability of future generations to meet their own needs [1]».

However, this treatment of the term is criticized by some scientists. For example, in [2] academician N.N. Moiseev noted: «The «sustainable development» is difficult to translate into Russian ... In Russia this expression was translated as «sustainable development». Such a translation of the term «sustainable development» seems to me a kind of linguistic nonsense, sustainable development simply cannot be – if there is development, then stability is no longer there!». Moiseev says: «I think that now it is no longer appropriate to abandon the phrase «sustainable development» – we have become accustomed to it. But the term itself should be have a meaning that meets the scientific content of the problem and the real needs of society».

After the report of the WCED, the main goals of sustainable development were formulated and refined in a number of international documents and programs developed under the auspices of the United Nations.

The past years have shown that the term «sustainable development» has indeed entered into everyday practice, among both politicians and scientists. In the first sence, most authors understand it as the rational coexistence between humans and their habitat.

Thus, in our opinion, when using the term «sustainable development» in relation to infrastructure systems (electrical, thermal systems, water supply and sewage systems, etc.), it is necessary to use the ideas above about the joint development of mankind as a whole and the environment. These systems must constantly evolve under the influence of external forces, including environmental factors such as climate change.

The issue of climate change began to worry the world long ago. The first world meeting on this issue was held in 1979, and the Intergovernmental Panel on Climate Change met for the first time under the auspices of the United Nations in 1988.

The Resolution adopted by the UN General Assembly on September 25 2015, noted [3] that «Climate change is one of the greatest challenges of our time and its adverse impacts undermine the ability of all countries to achieve sustainable development».

Are such changes already taking place, and are they of vital importance for the progress of mankind in the 21st century? After all, many other political, economic, social and environmental issues also require immediate attention.

The analysis shows the existence of a sufficiently large number of scientific data and expert opinions which confirm that climate change is a serious problem and affects every person on Earth.

Thus, in work [4], it is noted that «Earth's 2016 surface temperatures were the warmest since modern recordkeeping began in 1880, according to independent analyses by NASA and the National Oceanic and Atmospheric Administration (NOAA).

Globally-averaged temperatures in 2016 were 1.78 degrees Fahrenheit (0.99 degrees Celsius) warmer than the mid-20th century mean. This makes 2016 the third year in a row to set a new record for global average surface temperatures. The 2016 temperatures continue a long-term warming trend, according to analyses by scientists at NASA's Goddard Institute for Space Studies (GISS) in New York. NOAA scientists concur with the finding that 2016 was the warmest year on record based on separate, independent analyses of the data».

It is shown [5] that «Climate change is a major driver for increasing pressure on water resources, which will possibly aggravate the effects of other water stressors and alter the reliability of current water management systems and infrastructure».

It is emphasized [6] that «Climate change and sustainable development are the central challenges of our time. They are inseparably linked and need to be addressed together. Action to reduce greenhouse gas (GHG) emissions and adapt to climate impacts is essential for ensuring sustainable development».

It is noted [7] that «by raising the levels of warming above pre-industrial levels, a high impact on the food production, water resources, and ecosystems, in addition to posing a moderate high-risk to human and natural systems».

In work [8] it is said that according to some energy companies, «climate change will lead to physical damages to power plants, resulting in reduction or interruption of power production».

It is stated [9] that the indirect effect of climate change «manifests itself in the deterioration of the living conditions of the population, in particular, the destruction of houses as a result of the erosion of coastal areas, the shortage of drinking water, the deterioration of roads, which alters the infrastructure of settlements as a result of floods and the degradation of permafrost, raising the level of atmospheric air pollution in industrial cities and other consequences».

In work [10] it is predicted that «In 2050, only 58% of the world's population will have enough fresh water, and 24% will suffer from its lack. This will be a considerable «merit» of climate change».

Considerable attention is paid to the impact of climate change on water infrastructure. In [5] it is noted that «raising awareness of the consequences of long-term climate change, in particular for water security, with more frequent and extreme droughts means that more attention should be paid to different planning methods for creating sustainable water supply systems. Climatic factors, such as temperature, precipitation, snowfall and so on, have a significant impact on the state of water resources».

The World Health Organization (WHO) expresses its concern about the health of people in the context of climate change. It is said [11] that «Climate change is now recognized as one of the defining challenges of the 21st century, and protecting health from its impacts is an emerging priority for the public health community. Further, the potential range and magnitude of associated health risks should be central to the rationale for actions to mitigate the occurrence of climate change».

The analysis showed that taking into account climate change, more attention is paid to ensuring the reliability and protection of water supply and sewage systems. In terms of long-term investment decisions (dams, treatment facilities, pipelines), it is proposed to use a wider range of climate variability to avoid costly mistakes.

The domestic scientific press also addresses issues of climate change and the impact of this change on various aspects of the life of the Russian population, infrastructure systems, etc.

It is shown [12] that, «Given the data for 2016, the average annual temperature in the territory of the Russian Federation, it continues to grow more than 2.5 times faster than the global temperature, at a rate of 0.45°C per 10 years, and especially rapidly fast in the polar region, where the growth rate reaches 0.80°C per 10 years (Taimyr). However, the nature of warming is not the same in different seasons. The growth of spring precipitation continues, but summer precipitation in the southern half of the European part of Russia and in the Urals is decreasing ... The level of CO_2 concentrations in the surface layer of the atmosphere reached its new maximum in 2016 ... In 2016, 590 cases of meteorological phenomena and complex adverse meteorological phenomena were registered. All these, as a rule, caused the most significant damage to the sectors of the economy and the private sector».

The influence of climate change on the safety of gas pipelines is estimated [13]: «In the anomalous zones of river basins of Russia, considered in the article, one should expect changes in the characteristics of the runoff. These characteristics will affect the sediment runoff parameters, as well as the load on the transitions of gas pipelines through water barriers, on deformation of banks and river beds and watercourse land, on the denudation of underwater gas pipelines».

In some regions, major changes are possible. It is reported in [14] that «In the Baikal region, modern and particularly predictable conditions favor climatic desertification».

If you turn to the Ural region, you can also note evidence of climate change. According to the Sverdlovsk hydrometeorological center [15] «during the period from 1960 to 2011, the trend of changes in the average annual temperature and precipitation values was revealed. Graphs of the temperature trend confirm the process of climate warming».

How can changes in climatic factors influence the stability and sustainability of the systems of water supply and sewage systems (WSSS)? According to information from municipal enterprise «Vodokanal» Ekaterinburg [16]: «the Low volume of flood 2017 (67% of meteorologists' forecast) did not allow to fill 100%the reservoir of Yekaterinburg. A small amount of rain made it impossible for the accumulation of water in the summer months. Today «Volchikhinskoe» reservoir is filled at 72%. To transfer the missing amount of water (25 million cubic meters) in «Volchikhinskoe», reservoir will be connected to the pumping water system from «Niazepetrovskoe» reservoir at a flow rate of 3.0 m3/s. Cost will be 35 million rubles per month. It is planned to pump for three months». Over the past decade, municipal enterprise «Vodokanal» had to resort to such transfer 8 times, indicating the influence of climatic factors on the operation of the water system.

The normal operation of infrastructure systems, in particular water supply and sewage systems, can be complicated in emergency situations that may occur when climate change occurs.

In general terms, the security and sustainability of WSSS are associated with the emergence of natural and man-made disasters and terrorist acts. Both water sources and individual elements of these systems can be affected: water intakes, water treatment facilities and wastewater treatment plants, pumping stations, storage tanks, pipelines, power supply and automation systems, installations for the preparation of reagents and chlorinator systems, laboratories, dispatch centers and etc. The greatest risk is associated with possible contamination of sources of drinking water with such substances, that can't be removed by water treatment stations which are not designed for that purpose. There may be a reduction of water resources in water sources or their redistribution through the territory, changing the parameters of the water source (the depth of the riverbed, its width, the speed of water movement etc.).

Measures to prevent accidents, disasters, terrorist acts and their elimination are prescribed in the relevant documents of the Ministry of Emergency Situations (MES) [17-19]. There are also requirements for creating backup sources of water supply for populated areas [20]. In the process, climate change situations may arise that are similar to extraordinary events, and differ from them in some parameters: the time of impact, its strength and depth. Nevertheless, it should be noted that these documents do not cover the whole range of situations that may be caused by climate disturbances. From this point of view, a serious analysis of the possible consequences and the development of specific regional measures for their prevention and elimination are needed.

A complex analysis of the effectiveness of the operation of the water supply and sewage systems was carried out based on "schemes of WSSS" of settlements and urban entities of the Sverdlovsk Region. The analysis showed the presence of many deviations from the normal functioning of these systems. It is necessary to carry out major repairs, reconstruction or replacement of equipment, modernization of existing technologies for water treatment and sewage treatment, equipment for sedimentation treatment. It requires strengthening the material base, as well as solving personnel issues, upgrading their skills in accordance with innovative solutions. It is clear that the presence of such shortcomings can be further exacerbated by phenomena related to the impact of climate change.

In this setting, it is necessary to consider the situation in which climate change and related impacts on water supply and sewage systems do not cease, but continue to move in a negative direction for these systems. At the same time, the WSSS systems must be improved in order to perform the functions assigned to them: maintaining the required water quality, supply and pressure, providing the required degree of wastewater treatment.

Such state of water supply and sewage systems really implies their constant development, i.e. the movement towards the use of innovative technologies for water treatment and wastewater treatment, the use of more modern equipment, the continuous growth of the skills of personnel.

In this way:

- Current negative trends in climate change should be considered as unfavorable factors for the sustainable functioning and development

of infrastructure facilities (for example, WSSS) in the Russian regions;

- reduction of greenhouse gas emissions and active adaptation to climate change, consisting in the adaptation of anthropogenic (man-made) and mixed systems to adverse changes, should be considered as the main directions for eliminating the negative factors of climate change;
- improving energy efficiency, using alternative energy sources, developing and implementing innovative technologies with zero or low carbon content will reduce the dependence of infrastructure systems on climate change.
- To ensure the sustainable development of regional infrastructure systems water supply and sewage systems in the context of climate change, the following tasks must be accomplished:
- to conduct qualitative and quantitative assessment of factors that may arise as a result of climate change and affect the operation of the systems;
- to assess economic, environmental and social implications of climate change for the region from the point of view of violation of the existing natural and man-made balance;
- to determine the reserves to ensure the stability and reliability of the systems in the face of climate change;
- create a regional database (legal, organizational, scientific aspects, etc.) that will provide reliable, safe and efficient operation of systems in the face of climate change;
- to carry out the examination and updating schemes water supply and sewage systems of settlements of the region;
- inform professionals and the public about the consequences that may arise in the process of climate change in the region, to develop practical adaptation measures to such changes and neutralization of negative phenomena;
- to introduce in educational programs of higher educational institutions questions about the readiness of infrastructure systems for work in conditions of climate change.

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