ISSN 2334-7171

ISSN 2334-7058 (Online)
DOI 10.12709/issn.2334-7058

4D 61 6E 61 67
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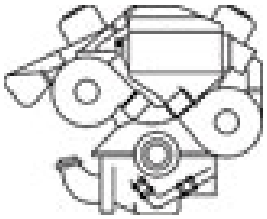
MEST Journal

Edited by
Zoran Čekerevac

MESTE Vol. 8 No. 1 January 2020



ISSN 2334-7171
ISSN 2334-7058 (Online)
DOI 10.12709/issn.2334-7058
This issue:
DOI 10.12709/mest.08.08.01.00

MEST Journal

Management
Economics
Education
Science & Society
Technologies

Edited by
Zoran Čekerevac

CIP – Каталогизација у публикацији
Народна библиотека Србије, Београд

005+37+3+66

MEST Journal : Management, Education, Science & Society, Technologies / editor-in-chief Zoran P. Čekerevac. – [Štampano izd.]. – Vol. 8, no. 1 (2020) – – Belgrade : MESTE NGO : Faculty of Business and Law of the "Union – Nikola Tesla" University in Belgrade ; Toronto : SZ & Associates, 2013- (Belgrade : ICIM+). – 30 cm

Polugodišnje. - Drugo izdanje na drugom medijumu: MEST Journal (Online) = ISSN 2334-7058
ISSN 2334-7171 = MEST Journal (Štampano Izd.)

COBISS.SR- ID 196182028

Circulation: 100 copies

MEST Journal online

www.mest.meste.org

DOI 10.12709/issn.2334-7058

Current Issue: DOI 10.12709/mest.08.08.01.00

MEST Journal is an international academic journal, the official journal of the non-profit organization MESTE, published online, as well as print, which publishes scientific and professional research articles and reviews in the English language. MEST Journal is published from Belgrade - Serbia and Toronto - Canada. The focal point of the journal is at international level, with the view on matters from a global perspective, but, also, some papers concerning some local specific events could be published. The science and technological advancements and their socio-political impact that happens all over the world can find a place in the MEST Journal. The journal is indexed by Index Copernicus in ICI Journals Master List ICV from 2015, in ERIH PLUS from 2017, in Google Scholar, CrossRef, COBIS.SR, COBIB.RS, Kobson, Scilit, CiteFactor, etc.

Publishers

- **MESTE NGO** – Belgrade
- **Faculty of Business and Law** of the "Union – Nikola Tesla" University in Belgrade, Belgrade, Serbia
- **SZ & Associates**, Toronto, Canada

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Editorial staff – Production:

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Printed by: **ICIM+, Belgrade** Circulation: 100 copies
The journal was published online at URL: https://mest.meste.org/MEST_1_2020/K1_eng.html

The MEST Journal is registered in doiSerbia of the National Library of Serbia, COBIB.SR, Matica Srpska Library, COBISS.SR, Google Scholar, CrossRef, OALIB, EleCas base of KoBSON, the Index Copernicus ICI Journals Master List from 2014 (*ICV 2019 =100.00*), Scilit, ROAD, ERIH PLUS, CiteFactor, and in the ResearchBib (IF: 2020 Evaluation Pending).

All published papers have been internationally reviewed

Two issues of journal are published annually, on January 15th, and July 15th.

ISSN 2334-7058 (Online) &
ISSN 2334-7171

MEST Journal
Year VIII, Vol. 8, Issue 1
DOI: 10.12709/mest.08.08.01.00

Editorial on MEST Journal 2020-1

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Editor-in-Chief
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Belgrade, January 15th, 2020

Welcome to the newest issue of the MEST Journal!

Four years ago, we have started to use a new platform for publishing our journal, Open Journal System (OJS). All the previous issues we republished on it. At the request of readers and authors, we are prolonging the publication of both versions of the journal.

Between the two issues of the MEST Journal, we have included in the Scientific Board of the MEST Journal as permanent members two renowned scientists, prof. dr. Sergey Kirsanov and prof. Dr. Evgeny Safonov. Also, we actively participated in the organization and realization of the International Scientific Conference "ZITEH 2019" which dealt with the topic "Modern Information Technology - Use, Misuse, and Protection". The conference was fruitful, and we plan to organize it this year again.

The MEST Journal is registered in the DOI system by CrossRef and all articles published in this issue, as well as in the previous issues of the MEST Journal, have their own DOIs. The MEST Journal is registered in doiSerbia of the National Library of Serbia, COBIB.SR, Matica Srpska Library, COBISS.SR, Google Scholar, CrossRef, OALIB, EleCas base of KoBSON, the Index Copernicus ICI Journals Master List (ICV 2018 = 100.00), Scilit, ROAD, ERIH PLUS, CiteFactor, and in the ResearchBib.

We keep the practice that articles, that have undergone peer review, and will be published in the next issues, we make available to readers in the form of preview - early reading.

This issue is published online and in print. In this issue, fifteen of the submitted papers were published, of which seven were classified in the group of the original research scientific papers, and eight in the group of the scientific review articles.

We follow the mission and vision of the journal, and we help authors to publish their works and present their achievements in the most convenient way. However, we point out that the editors do not censor the works that we publish, as well as the published works, can contain and/or proclaim views that could differ from the views of the editorial board. We check articles on plagiarism, but we are not able to guarantee the accuracy of the data published in the scientific and professional works of our authors. We believe that our authors are honorable and publish only their original works with really achieved results. For the quality of papers that we publish, we thank the authors and reviewers who did their job well and conscientiously.

We invite you to publish your works, and we will help you!

Zoran Čekerevac

Prof. Dr. Dr. h. c. Zoran Čekerevac

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These are basic, but not exclusive themed areas.

MEST Journal
DOI 10.12709/mest.08.08.01.01

ON LEGALLY ENFORCED MINIMUM WAGES

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JEL Category: **J64**

Abstract

This paper offers a critique not only of raising government-enforced minimum wages but allowing them to continue in existence. This law makes it impossible for some unskilled workers to obtain employment and raises no one's wage in the long run. Minimum wages are defended, primarily, on the basis of an ethical (in our view, mistaken) point of view, not on economic grounds. We analyze the economics of wage determination and explain why minimum wages thwart the process of increasing capital formation and thus real wages. Hence, since wages are the result of discounted marginal revenue products, any intervention to artificially increase them not only ends up harming workers on the margin (those whose productivity is below levels mandated by law), but also distorts the labor market, capital allocation, and economic growth and development.

Keywords: Minimum wage law; unemployment; justice.

INTRODUCTION

Section I looks at this law from an ethical perspective while section II touches upon the corporate/private minimum wage and its characteristics. Section III deals with the minimum wage on a theoretical level. We conclude in the last section.

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SECTION I: APPEAL TO ETHICS

Since the debate on legally enforced minimum wages is surrounded by ethical considerations, it is important to discuss them and their appeal to emotion. A growing trend among the comparatively unskilled and unexperienced is that large corporations represent evil and lead to growing wage inequality in the nation. How can it be just that a corporate CEO earns over a thousand times more than the struggling factory worker who has to support his family? Is this great disparity not an example of the failings of the capitalist state? The proper way of analyzing the

subject is by resorting to methodological individualism. Instead of decrying such a disparity, we should focus on what factors determine salary. And that, clearly, is productivity. The reason LeBron James earns so much money[1] is that, due to his efforts, his employer adds substantively to his bottom line. The reason a CEO is worth so much is that, according to the market, he, too, brings home the bacon. Both contribute great value to a company, and if their salaries did not reflect that primordial fact, competitors would snap them up, both of them, and pay them well

Yet, the comparatively rich CEO is not the person we are concerned about earning a living wage. A living wage is defined as the minimum amount that an individual would need to sustain himself with housing and food. So, let's introduce two characters who will help demonstrate the value of the individual. Sam and Max are both 18 years old and work at a generic store. We know nothing of their work ethic and neither have any previous experience so they are both hired at the minimum wage,[2] for this example we will say $8 dollars an hour. Two years later Sam makes $8.50 an hour and Max makes $16 dollars an hour. Is this unjust? What makes Max so special? Could it be that Max was always at work on time, was cleanly dressed, satisfied customers, cheerfully obeyed the manager's instructions? What if Sam was a decent employee but just didn't do anything to stand out? The generic store has to have valued Max more and raised his wages in order to reflect his increased productivity. Now let us change the scenario so that after a year of the two being employed, a new $10 minimum wage was enacted. At the end of the year, two Max still earns $16 dollars an hour while Sam has lost his job. This is no fault of Sam's and the generic store would still like to have him employed at the $8.50-hour price.

Some might argue-that the owner is being stingy and that he could surely have paid Sam that $1.50 an hour from his own funds, or, at least from Max's pay. However, if he does the former, once too often, he will go broke, and not be in a position to hire anyone. If he does the latter, his competitor will offer Max $16 an hour and woo him away from his present employer. The company must do what is competitively best in order to remain in business

From a libertarian perspective, a minimum wage policy also violates the rule of freedom of association. If an employer and employee agree on a deal, it should not be the government's role to intervene. If at $6 an hour an employer wants to hire someone to sit in a chair to stare at paint drying and an employee accepts, it should be a legitimate decision. At $7.25 the employer will no longer value someone staring at the wall; he will then have to deal with looking at an empty chair. Sam would rather work for $6.50 or even $6 dollars again if it means he still would be employed. Jobs are lost that would have been created or retained if the government didn't interfere in the interaction of these two consenting parties.

From a utilitarian perspective, it also makes sense to allow for freedom of contract enforced by the ethics that define a society. If the majority of customers of a business are upset at a decision in the company, there will tend to be repercussions. There will be critical news articles, people in the industry cutting ties, consumers who boycott the product/ service, and investors who start to trade against[3] and thus devalue the stock of the company.

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[1] This an amount easily the equivalent of a well-payed CEO, or more. And, yet, for some strange reason, no one ever complains about the multiple of his pay vis a vis the man who sweeps the basketball court after the game. Maybe it is not so strange. Perhaps this is because even the meanest intelligence can appreciate his contribution to society. That of the CEO is possibly more difficult to appreciate.

[2] The idea that the minimum wage does not have negative effects on employment can be traced in its modern form to Card and Krueger (1994). A critique can be seen in Neumark and Wascher (2000). This debate continued in several works, among which can be seen in Dube, Lester and Reich (2010), Neumark, Salas and Wascher (2014), Jardim, et. al. (2017), Harasztosi and Lindner (2019), Reich, Nadler, Allegretto, and Godoey (2018).

[3] Sell short

We invest heavily in private charity and help those who are downtrodden in a community. This is done for the benefit and good feeling that is created and supported (as Adam Smith (1759) explained, *sympathy*). Employers want to keep their employees happy and productive; this is why we see other forms of payment in addition to wages. Hence, companies will hold retreats, buy comfortable chairs, put in a fish tank, etc. They do so in order to retain talented employees. To be sure, there are also miserable unhappy dead-end jobs that physically and emotionally drain their employees. But, someone has to wash the dishes, pick up the garbage. To the extent these job slots are considered onerous, additional pay will be offered to compensate workers.

SECTION II: CORPORATE/PRIVATE MINIMUM WAGE

There are politicians who point to examples of large corporations providing their own private minimum wage as indicative of support for legislation mandating this state of affairs. The difference between a privately undertaken minimum wage and publicly enforced one is significant for multiple reasons. Whereas the latter creates unemployment for unskilled workers, the former creates competitive benefits for a company. Additionally, the public minimum wage is forced upon a corporation, while a private one is voluntary.

Ikea freely decided to incorporate a minimum wage of $10.76 for all its U.S employees (Hellman, 2014; Jamieson, 2015).[4] Unlike the public counterpart, this private minimum wage may have lucrative effects for the company. A higher base wage for the company renders present and potential employees more eager to work there. This could mean a more motivated staff which would attain for itself a competitive advantage. The marginal productivity of the workers employed might possibly arise as a result of this practice. Hence, the reasons for establishing a voluntary floor for wages inside a company do *still* take into account the essential factor at work when determining wages: discounted marginal revenue products.

SECTION III: WAGES AND THE MINIMUM WAGE

Market prices guide a rational allocation of resources (Mises, 1949). Minimum wages are, indeed, a price. If they are imposed on, labor, in this case, they do not rationally allocate society's resources.

As the price of a factor of production, the analysis of wages is not different than that of other factors. That is, their price responds to the theory of imputation. In other words, the level of wages depends on the service produced by the employee. The more homogeneous a specific work is, then the less scarce, and the less valuable in relative terms it is. Thus, the wage is lower. The opposite happens when it is extremely specialized, and highly scarce, again, other things equal.

In technical terms, wages are a reflection of discounted marginal revenue products (Block, 1990). As such, the key is which product they produce. To dissociate the final product (hence, the marginal revenue product) from the work of labor, is to turn the concept of wage meaningless in economic terms. Where does the value of labor come from? If it is not arbitrary, then it stems from marginal revenue product. Since productive processes take time, and time preference is indeed relevant, then, we need to discount it[5]. And what, in turn, is this based upon? Discounted marginal revenue product (DMRP) is predicated upon the quantity and quality of the capital equipment with which labor works. Mexicans, in that country, have low DMRPs, and hence low wages, since the sophistication, and quantity of the capital with which they work is low. When they arrive in the US, their internal human capital (Becker, 1964) changes not one whit, but the machinery and tools available certainly does. And why, in turn, is there more and better capital

[4] That is one way of putting the matter. A more accurate one would be merely to say that this company engaged in a wage increase. In contrast, a real minimum wage is compulsory. To violate it is to incur criminal penalties. In contrast, if Ikea lowered its wage, as long as it remained above the level required by law, it would suffer no legal penalty.

[5] That is an important difference between the neoclassical and Austrian approach (Block, 1990).

available north of the Rio Grande rather than south? This is explained by the different levels of economic freedom prevailing in the two countries (Gwartney, et al., 1976).

Proponents of minimum wage often claim that workers and business owners do not negotiate on the basis of equal power. However, in reality, workers do not face any such asymmetric situation. It is not, as the cartoons like to show, the fat capitalist facing a poor wage earner. Quite the opposite is the case. The real situation is that workers compete with other workers for a specific position, and at the same time, employers compete with other employers in order to employ a given worker. In that sense, in terms of Böhm Bawek's (1888 [1930]) dynamics, wages are the result of, like any other market price in this context, bilateral competition, and marginal pairs.[6]

Therefore, the relative scarcity of labor supply in a specific industry, with respect to its demand elsewhere, is one determinant of wage rates. And the bidding by employers takes into account, then, discounted marginal revenue products.

More specifically, the supply of labor of any specific industry depends on the demand for labor of competing industries. Thus, when a worker can earn *x* in industry *A*, while industry *B* offers *x+1*, then he will tend to leave *A* for *B*.[7] However, if *B* wants to attract workers, it will have to increase wages. And, of course, the higher the quantity and quality of capital in any area, the greater the wages, other things equal, due to competition for workers among employers. This is why cities tend to have higher wages, in relative terms, than in the countryside.

Why would *B* increase wages in the first place? This is because they see a profit opportunity: the gap between production costs and sale price, always suitably discounted.

If industry *B* produces 100 units of product ***z*** and has one worker whose wage is $100, then each unit of *z* costs $1 of labor. However, *B* acquires capital in order to enhance its production process. Now, it produces 200 units. Posit that labor costs associated with the production of *z* were reduced by 50%! Hence, industry *B* may very well increase the wages it pays to its worker, in order to preclude him from going elsewhere. It may attract another worker in order to produce more with the new capital, for instance, 400 units. How does it attract another worker? By increasing its wage to *x*+1 or more (being x the wage of the new worker in the non *B* industry).

Observe that everyone wins, when capital accumulation takes place. But minimum wage laws disrupt this process since it negatively impacts every step of the previously explained virtuous circle. It creates fewer jobs available (workers' DMRPs do not justify higher wages), fewer companies appear since they cannot sustain themselves, job benefits decrease because employers tend to reduce non-monetary compensations (vacation, health insurance, etc.), job desirability is reduced, because of other cheaper labor conditions apart from wage are established in order to sustain the company.

Further, there is an incentive to invest in automation, since this law renders it *relatively* cheaper. Minimum wage, then, paradoxically (although logically) ends up benefiting high skilled labor, rather than low skilled labor, precisely that labor that the minimum wage was presumably[8] set to protect.

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[6] The only counter argument to this is labor monopsony or oligopsony. This is a very weak argument, with the possible exception of highly skilled scientists, engineers, chemists, who have only one or a very few potential employers in their narrow fields. However, their salaries are way above and beyond minimum wage levels, so this possible counter example is not apropos. For a critique of monopsony in general, see Block and Barnett (2009).

[7] The impetus for this can either be a "push" from the employees' side, who seeks greener fields, or a "pull" from other employers, who are now "raiding" the firm that pays inordinately low wages.

[8] There is a heavy emphasis on this word, since in point of fact, the most vociferous supporters and beneficiaries of this pernicious legislation are labor unions, who are in competition with low wage labor. How better to drive them from the labor market than to reduce, by law, their ability to compete with higher skilled union labor?

Minimum-wage supporters often resort to the argument that those jobs which pay low wages are bad from a moral perspective. Not so, not so. The minimum wage will create a *lower* wage, of *zero*, for all those workers whose productivity falls below the level stipulated by this legislation. If by pure enactment we could actually raise wages, why not advocate $100,000 an hour? Then, we would all be rich, beyond the dreams of avarice. Supporters of minimum wage laws fail to respond to this objection. Subconsciously, they do know that there is a relation between productivity and wage rates, although they believe that small, compulsory marginal changes to low wages (thus establishing minimum wages) barely affect the situation of low scale workers. In reality, because it affects precisely those on the *margin*, legislators do not pay attention to those who are rendered unemployable.

CONCLUSION

What is the best way to increase real wages? Reduce taxes, which increases capital accumulation, production and reduces prices. Eliminate taxes on labor. Abolish the welfare state, that distorts incentives to work, accumulate capital, and produce. In sum, free markets, not minimum wage laws.

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Received for publication: 23.09.2019
Revision received: 18.12.2019
Accepted for publication: 10.01.2020

How to cite this article?

Style – **APA** *Sixth Edition:*

Aguilar, K., Futerman, A. G., & Block, W. E. (2020, January 15). On legally enforced minimum wages. (Z. Cekerevac, Ed.) *MEST Journal, 8*(1), 1-6. doi:10.12709/mest.08.08.01.01

Style – **Chicago** *Sixteenth Edition:*

Aguilar, Kevin, Alan G Futerman, and Walter E. Block. 2020. "On legally enforced minimum wages." Edited by Zoran Cekerevac. *MEST Journal* (MESTE) 8 (1): 1-6. doi:10.12709/mest.08.08.01.01.

Style – **GOST** *Name Sort:*

Aguilar Kevin, Futerman Alan G and Block Walter E. On legally enforced minimum wages [Journal] // MEST Journal / ed. Cekerevac Zoran. - Belgrade – Toronto : MESTE, January 15, 2020. - 1 : Vol. 8. - pp. 1-6.

Style – **Harvard** *Anglia:*

Aguilar, K., Futerman, A. G. & Block, W. E., 2020. On legally enforced minimum wages. *MEST Journal,* 15 January, 8(1), pp. 1-6.

Style – **ISO 690** *Numerical Reference:*

On legally enforced minimum wages. **Aguilar, Kevin, Futerman, Alan G and Block, Walter E.** [ed.] Zoran Cekerevac. 1, Belgrade – Toronto : MESTE, January 15, 2020, MEST Journal, Vol. 8, pp. 1-6.

MEST Journal
DOI 10.12709/mest.08.08.01.02

A HYBRID DESIGN PROCEDURE FOR FAULT DIAGNOSIS IN A PV POWER PLANT

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JEL Category: **L86, O13, Q42**

Abstract

A solar panel monitoring system is an indispensable part and should be of priority in the design of solar power plants to get the highest possible efficiency of solar panels. This paper presents a hybrid PV solar plant monitoring system based on two communication technologies; namely WSN and RFID. The first part consists of multi-sensors (voltage, current, temperature, humidity, dust, smoke, irradiation, and rain) installed on each PV panel. These sensors will collect data from the panels and send them to a cloud database via Wi-Fi modules. The user can log in to this cloud database and display the recorded data in real-time. The second part utilizes RFID as a supporter when the internet is not available. A microcontroller will send data to the local control room in the solar station via Radio Frequency (RF) modules. A panel information detector will be added to this monitoring system to facilitate detect PV panel's history information. In addition, the fault detector software is based on the C# programming language and MySQL database. Some practical verifications of the proposed monitoring system have been successfully obtained from an experimental set-up installed on the existing solar station installed on the rooftop of the building of the Technical Institute in the city of Baquba, Iraq.

Keywords: *WSN, RFID, solar energy, monitoring system, hybrid system, fault detection, wi-fi module, PV system, cloud server, RF module*

1 INTRODUCTION

Solar power has become one of the most important sources of electricity generation in modern times where it has become a destination for developed countries to provide the electricity needed to meet their needs as it is considered successful alternative energy for fossil fuel. Despite the existing high cost of building solar power plants, they are a clean and environmentally friendly source where it does not generate noise and does not cause air pollution, as it converts the solar energy into direct electric power by the photovoltaic effect.

However, one of the main reasons that might not make this technology be more popular to be in the

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top spot is that it is often exposed to faults and malfunctions leading to many external unwanted effects. These faults lead to a decrease in efficiency and a lack of power to meet the need for them compared to the cost of their construction (Al-Naima & Hamad, 2019). A number of failure modes of PV modules are observed in the field during operation and in the laboratory during testing for certification. Climate chamber tests, hot spot tests, and mechanical load tests have been identified as the most severe tests in the current standards (Ferrara & Philipp, 2012). A wireless sensor network for the monitoring of large PV plants has been proposed in recent research papers with an approach that relies on network sensors that collect detailed information about the electrical performance of each series of the photovoltaic plant. Performance analysis logic has been developed and implemented in a software control tool that analyses aggregated data and generates graphical reports to determine the immediate location of failures and yield losses (Guerriero et al., 2014) (Wahyuni & Wijaya, 2017).

In order to reduce the impact of these factors on energy production, it is imperative to design a solar panel monitoring system to monitor the energy production of individual solar panels. As well as external factors that reduce its energy production moment by moment and detect any fault that occurs in any solar panel and know the type of error and the causative factor (Bashir, Lim, Hussain, & Park, 2011) (Jaiswal, 2015). To facilitate the detection and maintenance of the damaged board as soon as possible, in this paper a hybrid monitoring system is designed and implemented based on two modern communications technologies, namely the RFID and the WSN in order to get a highly reliable system.

2 THE PROPOSED HYBRID SYSTEM

The PV panels under test installed on the rooftop of the building of the Technical Institute in the city of Baquba, Iraq. They are Mono Crystalline Solar PV Module Fortune FRS 250W for Domestic/ commercial applications, with a maximum power of 250 W as shown in Figure 1. This station consists of 60 such panels with technical specifications shown in Table 1. A monitoring circuit is allocated to each panel as transmitter and receiver parts. These parts consist of hardware and software to program these hardware components. The data collected from the sensors are sent to the local server PC via NRF24 to detect faults in the panels. The Nordic nRF24 is a family of silicon integrated radio transceivers operating in the 2.4GHz band.

Fig. 1 The Solar Panels Under Test

Table 1. Solar panel specifications

Module Type	FRS-250W
Peak power (P_{max})	250.00 W (peak)
Peak voltage (V_{mp})	30.50 V
Peak current (I_{mp})	8.20 A
Short circuit current (I_{sc})	8.72 A
Open circuit voltage (V_{oc})	37.20 V

2.1 Transmitter Side

In order to design a fault detection system for a solar station, many hardware components are needed. There are various types of components that can be used in the detection system, but the cost should be considered. In this project, the components used are simple and of low cost. An ACS712 Current Sensor is used to measure the DC current, Arduino 25V Voltage Sensor Module is used to measure DC voltage of the panel. The temperature and humidity are determined by a DHT11 Temperature and Humidity Sensor. The DSM501A dust sensor module is used to measure the percentage of dust on the panel. MQ4 Methane Gas Sensor is used to detect fire or damage that may occur in the panels. Rain Sensors Module FC-37 is used to detect if it is raining. All these sensors are connected to the Arduino Mega as a microcontroller that reads the sensor data and sends them to the cloud database via the ESP8266 Wi-Fi module or to air via NRF24L0 module, which can be detected by a receiver in the local control room. NRF24L0 module is used for sending and receiving data at

an operating radio frequency of 2.4 to 2.5 GHz ISM band (Bilic, Buyukoztekin, & Ozdemir, 2019). Figure 2 shows a flowchart for the transmitter side. The transmitter side system design is shown in Figure 3.

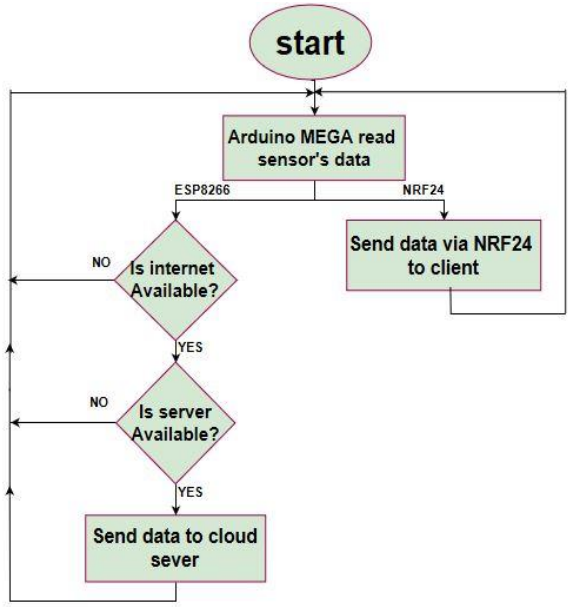


Fig. 2 Flowchart of WSN system transmitter side

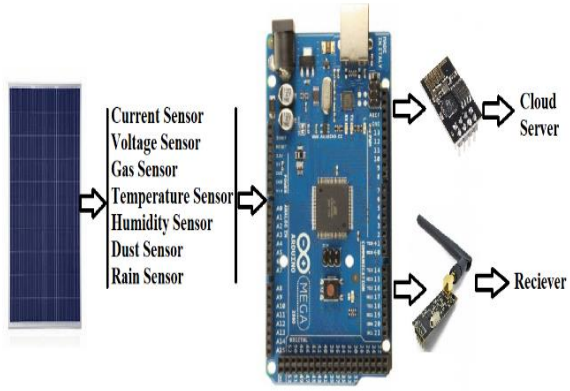


Fig. 3 Transmitter side system design

2.2 Receiver Side

Figure 4 shows a flowchart of the local receiver side, while Figure 5 shows the local receiver side system design. The Receiver can detect the available radio signal in the air and received it, then store it in the MySQL database to be displayed with GUI software designed by C# programming language to display received data and detect the fault types and their causes. This part of the receiver side is very useful when the internet is not available in the solar station, which guarantees to store all data when the internet is not available. In addition, if the internet is available, Mega will send sensors data to a cloud database via ESP8266 that anyone can log in and display remotely. A Real-time clock RTC DS3231 is added to display the time of each recorded process.

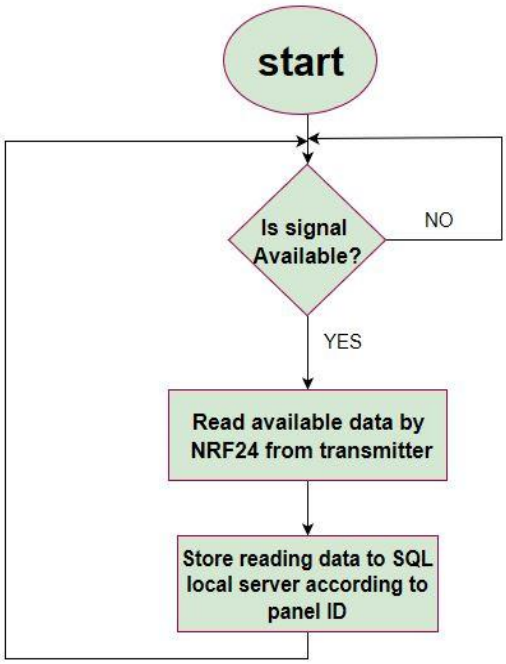


Fig. 4 Flowchart of the local receiver

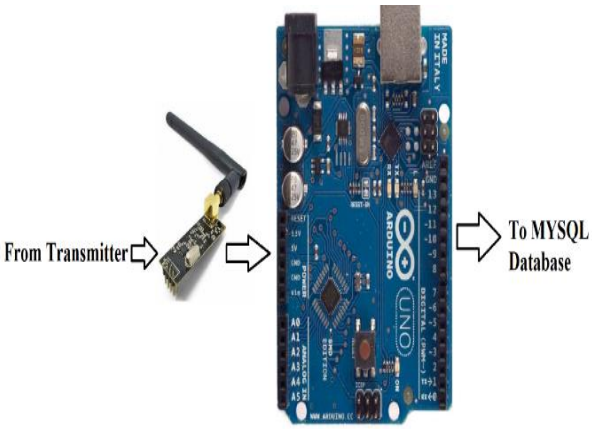


Fig. 5 Local receiver system design

3 FAULT DETECTOR SOFTWARE

The software is designed to detect the faults and their causes to facilitate maintenance of the panels by using C# programming language and MySQL database to store recorded data and display them by the designed software as portrayed in Figure 6, Figure7 and Figure 8 respectively.

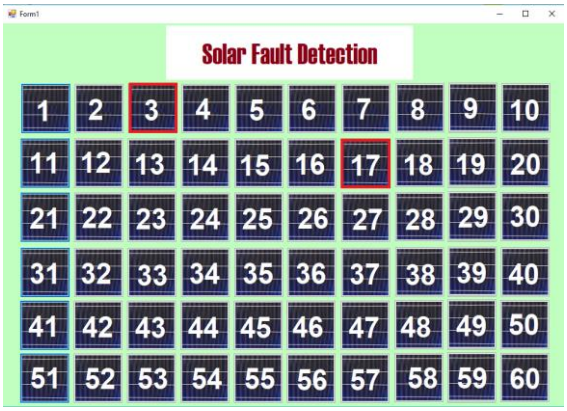


Fig. 6 Fault detector software home page

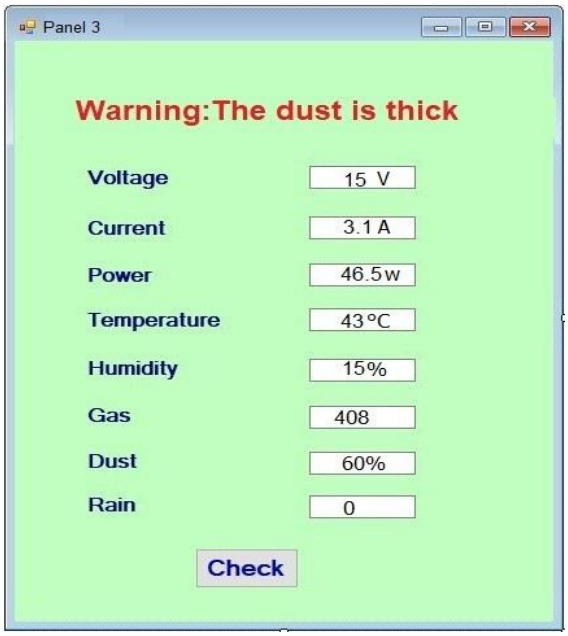


Fig. 7 Status page for panel 3

Fig. 8 Status page for panel 17

4 THE RFID SYSTEM DESIGN

The principle of RFID system functioning is an important part since it will improve the proposed monitoring system as it will facilitate the maintenance of solar panels quickly and easily. For example, when a fault occurs in a particular solar panel, it will require going to this solar panel to inspect and perform the necessary maintenance. However, before carrying out any such maintenance on this panel, one must be aware of its technical specifications and everything related to it in terms of the date of installation and all the previous sought maintenance and what faults it suffered previously so that the person who is responsible for the maintenance will be aware of all such details. Maybe this panel was previously exposed to the same fault several times and there is no point in going to get it back to service because it is going to be exposed to the same fault later. In such a case replacing this panel might be better than maintaining it. Figure 9 shows the proposed RFID device reader.

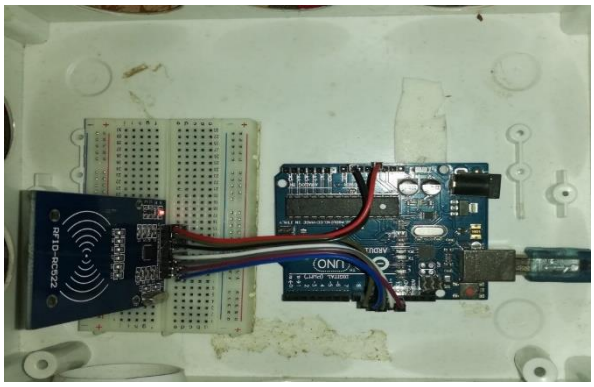
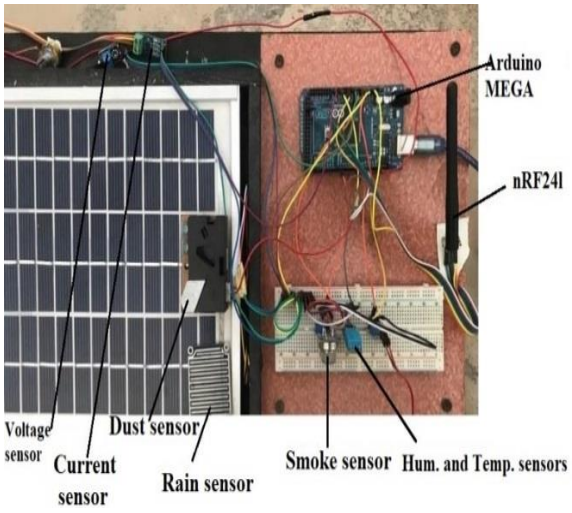


Fig. 9 The RFID device reader

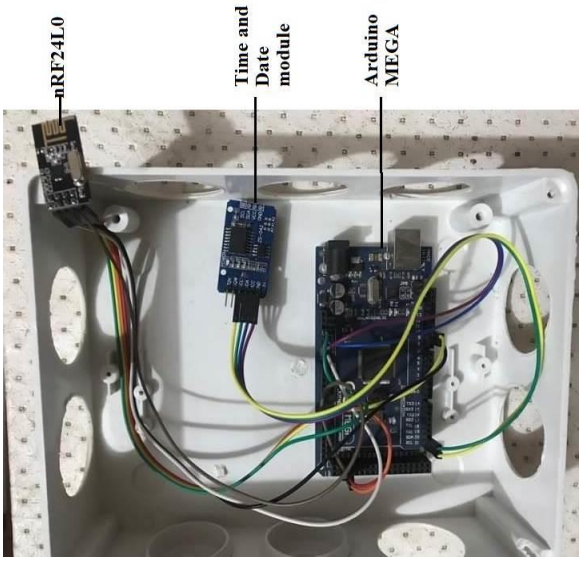
5 PRACTICAL IMPLEMENTATION

The proposed system consists of a transmitter and receiver, which constitutes hardware components and a software part to program these hardware components. The data collected from sensors will be sent to the local server by NRF24 to detect faults in the station. Of course, in order to design a complete fault detection system to cover the solar station, many such hardware components are needed for all panels. There are various types of components that can be used in the detection system, but the cost should be considered. In this work, the used components are simple and of low cost and available in the local market. In addition, it gives high flexibility to the proposed system. The

practical part of monitoring and detecting faults in solar panels has been successfully implemented on the solar power station installed in Baquba Technical Institute of the Central Technical University as shown in Figure 10.



(a)



(b)

Fig. 10 Practical circuit connection
(a) Transmitter side, (b) Receiver side

6 RESULTS AND DISCUSSION

Figure 11 shows the recorded data of panel 1 in string 1. Each column represents a factor, which affects the solar panel efficiency at different times of the day. For example, in 7/8/2019 at 12.30 pm the voltage is 23.2 V, the current of this panel is 7.62 A, and the corresponding power production is 176.78 W. This high power production is due to many factors, one of these factors is the high solar irradiation at this time which is 800 W/m^2, in addition to the high temperature which is 45 ℃. This shows that solar irradiation has positive effects on solar panel power production while the temperature has a negative effect. If the irradiation increases it leads to an increase in solar panel power production, but increasing irradiation also leads to an increase in the temperature, which, leads to a decrease in solar panel power production. The displayed smoke value is 432 at this time. This value is low in comparison with the maximum allowed value, as the allowed smoke range is between (300 – 1000) ppm. This means no indication of fire or damage in the panels or wires. In addition, the recorded dust value is 31%, and as is known, the dust reduces the sunlight falling on the solar panel which leads to a reduction in the energy generated by the solar panel and hence a reduction in the efficiency of the solar panel.

P1 Date 7/8/2019

Time	Voltage (V)	Current (A)	Power (W)	Temp. (°C)	Hum. (%)	Gas (PPM)	Dust (%)	Rain	Radiation (W/m^2)
10.00 AM	18.36	5.7	104.652	43	16	431	25	dry	641
10.30 AM	18.43	6.33	116.6619	43	16	433	23	dry	673
11.00 AM	19.96	6.33	126.3468	43	16	436	24	dry	680
11.30 AM	20	7.22	144.4	44	16	430	28	dry	700
12.00 PM	21.8	7.06	153.908	44	16	427	30	dry	760
12.30 PM	23.2	7.62	176.784	45	16	432	31	dry	800
01.00 PM	21.9	7.1	155.49	45	16	438	33	dry	777
01.30 PM	22.28	7.25	161.53	45	16	430	30	dry	787
02.00 PM	21.54	6.96	149.9184	45	15	429	25	dry	753
02.30 PM	21.51	6.96	149.7096	45	16	431	25	dry	727

Fig. 11 Panel 1- String 1 recorded data

To validate the system performance, a uniformly distributed layer of dust was sprinkled on panel 6 in string 6. The recorded data on this panel in 20/8/2019 at 12.00 pm were as follows: the current is 5 A, voltage is 13 V, and the power production of this panel is only 65 W. This power production is low according to the specification of this panel, which is 250 W, as maximum power production. On checking this panel with the fault detector software, it indicates that the dust value is 70% which is very high. This dust stops a large amount of sunlight from falling on the solar panel, which leads to a reduction in the solar irradiation and the power production of this panel as shown in Figure 12.

				P6	Date 20/8/2019				
Time	Voltage (V)	Current (A)	Power (W)	Temp. (°C)	Hum. (%)	Gas (PPM)	Dust (%)	Rain	Radiation (W/m^2)
10.00 AM	23.2	7.62	176.784	31	16	431	25	dry	450
10.30 AM	23.8	7.86	187.068	31	16.1	433	23	dry	500
11.00 AM	24.6	7	172.2	32	16.7	436	24	dry	560
11.30 AM	24.2	6.18	149.556	32	16.6	430	28	dry	580
12.00 PM	13	5	65	32	16.5	427	70	dry	300
12.30 PM	25.2	6.25	157.5	43	16.6	432	31	dry	620
01.00 PM	25	6.09	152.25	43	16.7	438	33	dry	610
01.30 PM	24.6	5.9	145.14	42	16.5	430	3	dry	600
02.00 PM	24.5	7.62	186.69	42	15.7	429	25	dry	590
02.30 PM	23.9	6.41	153.199	37	16	431	25	dry	390

Fig. 12 Panel 6- String 6 recorded data

On discovering this fault in panel 6, the operator in charge moves out to inspect this panel and test it on the spot using the designed RFID device to display the details of this panel including its previous maintenance history to discover the occurrence of damage in the panel connecting wires in a previous date in 2/4/2019 as shown in Figure 13. Figure 14 shows the typical recorded data on four other panels in the station.

```
This code scan the MIFARE Classsic NUID.
Using the following key: FF FF FF FF FF FFPICC type: MIFARE 1KB
A new card has been detected.
1337416067
Card Number: 1337416067
Panel ID: 6
Model Type: FRS-250 W
Peak Power(Pmax): 250W
Peak Voltage(Vmp): 30.50 V
Peak Current(Imp): 8.20 A
Last Maintenance: 2/4/2019
Fault Type: Damaged Wires
```

Fig. 13 Panel 6 detail with RFID device

				P2	Date 11/8/2019				
Time	Voltage (V)	Current (A)	Power (W)	Temp. (°C)	Hum. (%)	Gas (PPM)	Dust (%)	Rain	Radiation (W/m^2)
10.00 AM	20.1	7.09	142.509	41	15	423	23	dry	700
10.30 AM	20.4	7.05	143.82	41	15.7	425	28	dry	710
11.00 AM	20.6	6.29	129.574	41	15.7	428	27	dry	790
11.30 AM	21.1	7	147.7	42	15.4	422	29	dry	840
12.00 PM	21.72	6.66	144.6552	42	16	427	3	dry	900
12.30 PM	23.94	7.91	189.3654	43	16.3	428	31	dry	987
01.00 PM	23.84	7.82	186.4288	43	16.3	430	33	dry	970
01.30 PM	23.7	7.88	186.756	44	15.8	430	3	dry	900
02.00 PM	22.8	7.1	161.88	44	16	429	36	dry	860
02.30 PM	21.6	7.2	155.52	44	16.5	431	37	dry	800

(14. a)

				P3	Date 13/8/2019				
Time	Voltage (V)	Current (A)	Power (W)	Temp. (°C)	Hum. (%)	Gas (PPM)	Dust (%)	Rain	Radiation (W/m^2)
10.00 AM	19.5	6.15	119.925	42	16.7	420	22	dry	740
10.30 AM	24	6.93	166.32	42	16.4	423	23	dry	730
11.00 AM	23.8	7.86	187.068	43	16.2	415	24	dry	750
11.30 AM	23	7.54	173.42	43	15.4	426	29	dry	700
12.00 PM	23.8	7.86	187.068	44	15.8	427	22	dry	780
12.30 PM	21.7	7.02	152.334	44	16.2	423	27	dry	800
01.00 PM	19.9	6.9	137.31	45	15.4	428	27	dry	790
01.30 PM	21.2	6.41	135.892	45	15.4	430	30	dry	750
02.00 PM	25.1	6.37	159.887	45	16.5	429	31	dry	740
02.30 PM	25.2	6.41	161.532	45	16.6	431	25	dry	700

(14. b)

				P4	Date 15/8/2019				
Time	Voltage (V)	Current (A)	Power (W)	Temp. (°C)	Hum. (%)	Gas (PPM)	Dust (%)	Rain	Radiation (W/m^2)
10.00 AM	19	6.41	121.79	40	14.4	400	17	dry	500
10.30 AM	19.2	6.41	123.072	40	14.4	413	20	dry	560
11.00 AM	19.4	6.37	123.578	40	14.2	412	24	dry	540
11.30 AM	20	7.14	142.8	41	14	415	26	dry	600
12.00 PM	20.1	7.62	153.162	41	14	419	22	dry	610
12.30 PM	20	6.25	125	41	14.8	423	27	dry	615
01.00 PM	20.1	8.05	161.805	41	15	411	23	dry	600
01.30 PM	19.6	7.45	146.02	41	14.8	432	28	dry	594
02.00 PM	19.1	7.93	151.463	42	15.7	415	30	dry	591
02.30 PM	19	6.49	123.31	42	16	409	25	dry	530

(14.c)

				P5	Date 18/8/2019				
Time	Voltage (V)	Current (A)	Power (W)	Temp. (°C)	Hum. (%)	Gas (PPM)	Dust (%)	Rain	Radiation (W/m^2)
10.00 AM	20	6.45	129	38	14	407	15	dry	600
10.30 AM	20	6.41	128.2	38	14	415	20	dry	605
11.00 AM	21	7.3	153.3	43	15.7	412	22	dry	610
11.30 AM	21.3	5.51	117.363	40	15	416	21	dry	700
12.00 PM	21.3	6.86	146.118	43	15.4	419	22	dry	650
12.30 PM	25	6.49	162.25	40	15	420	21	dry	690
01.00 PM	25	6.41	160.25	41	15.6	409	23	dry	640
01.30 PM	20.9	7.3	152.57	30	13.6	410	23	dry	620
02.00 PM	17.5	5.36	93.8	43	15.7	416	20	dry	600
02.30 PM	21.3	6.86	146.118	43	16	430	21	dry	610

(14.d)

Fig. 14 Recorded data,
(a) Panel 2- String 2,
(b) Panel 3- String 3,
(c) Panel 4- String 4,
(d) Panel 5- String 5

7 CONCLUSIONS

In this paper, a hybrid PV panel monitoring system has been designed based on two communication technologies; namely WSN and RFID. The WSN part consists of multi-sensors (voltage, current, temperature, humidity, dust, smoke, radiation, and rain) that are installed on each PV panel. These sensors can collect data from PV panels and send them via Wi-Fi modules to the cloud database where a user can log in and monitor the PV system in real-time. The RFID part has been added to this system to give more flexibility to the monitoring system if there is no internet connection by sending the recorded data to a local receiver. A panel information detector has been added to this monitoring system to facilitate the detection of the history information of all panels. In addition, fault type detector software is designed based on C# programming language and MySQL database to detect the types of faults that affect the PV panels. The proposed monitoring system has been successfully implemented to an existing solar station installed in the Technical Institute/Baquba, Iraq.

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Received for publication: 16.12.2019
Revision received: 23.12.2019
Accepted for publication: 10.01.2020

How to cite this article?

Style – **APA** *Sixth Edition:*

Al-Naima, F. M., & Wahab, M. M. (2020, January 15). A hybrid design procedure for fault diagnosis in a PV power plant. (Z. Cekerevac, Ed.) *MEST Journal, 8*(1), 7-14. doi:10.12709/mest.08.08.01.02

Style – **Chicago** *Sixteenth Edition:*

Al-Naima, Fawzi M., and Maysam M. Wahab. 2020. "A hybrid design procedure for fault diagnosis in a PV power plant." Edited by Zoran Cekerevac. *MEST Journal* (MESTE) 8 (1): 7-14. doi:10.12709/mest.08.08.01.02.

Style – **GOST** *Name Sort:*

Al-Naima Fawzi M. and Wahab Maysam M. A hybrid design procedure for fault diagnosis in a PV power plant [Journal] // MEST Journal / ed. Cekerevac Zoran. - Belgrade – Toronto : MESTE, January 15, 2020. - 1 : Vol. 8. - pp. 7-14.

Style – **Harvard** *Anglia:*

Al-Naima, F. M. & Wahab, M. M., 2020. A hybrid design procedure for fault diagnosis in a PV power plant. *MEST Journal,* 15 January, 8(1), pp. 7-14.

Style – **ISO 690** *Numerical Reference:*

A hybrid design procedure for fault diagnosis in a PV power plant. ***Al-Naima, Fawzi M. and Wahab, Maysam M.*** *[ed.] Zoran Cekerevac. 1, Belgrade – Toronto : MESTE, January 15, 2020, MEST Journal, Vol. 8, pp. 7-14.*

MEST Journal
DOI 10.12709/mest.08.08.01.03

RESEARCH ON INDUSTRIAL DEVELOPMENT FACTORS FOR THE FORMATION OF INDUSTRIAL POLICY OF THE ASTRAKHAN REGION (RUSSIA)

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JEL Category: **D24, D58, O14**

Abstract

The article describes the major aspects of industrial policy of the Astrakhan Region under conditions of current competition between the states of the Caspian Sea region in the development of transport, oil and gas, shipbuilding clusters and the intensification in the activities of Azerbaijan, Kazakhstan, Iran, and Turkmenistan to increase their production potential and improvement of its efficiency. The authors come to the conclusion that it is possible to use the production function to create the model of a long-term regional industrial policy. The results of the industrial activity of the Astrakhan Region over the past decade, problems, factors and prospects of the development are analyzed. The patterns and trends of the development in the industries of the Astrakhan Region are studied applying the Cobb-Douglas production function; it is concluded on the dynamics of the economic efficiency of some industrial production sectors and on the possibility of using the production functions to assess the influence of different factor groups on the economic growth. The authors classify and characterize the factors of economic growth. They make a distinction between "production intensification" and "economic efficiency", consider the problems impeding the industry development and specify the points for the growth of industrial production. The conclusion is drawn on the need to relate the industrial policy of the Astrakhan Region and Russia in general to the leading states of the Caspian Sea region which will contribute to ensuring the economic security of our state and the need to intensify the industrial production of the region.

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Keywords: *production function; Cobb-Douglas function; mathematical models; economic growth factors; elasticity factors; industrial policy; production intensification; economic efficiency; extensive factors; intensive factors.*

1 INTRODUCTION

Describing the current cooperation of the Caspian Sea littoral states, it is necessary to consider the following main facts.

Nowadays, the Caspian littoral states compete with each other in the field of oil and gas production and oil refining, gas condensate, oil and gas transportation to other states both by land and by sea, respectively, and the development of oil and gas, shipbuilding, and transport clusters in their territories. At the same time, the attention should be focused on the fact that the importance of the Caspian Sea region as one of the largest sources of hydrocarbon raw materials is rapidly growing with a view to the increase in world energy consumption.

Azerbaijan, Kazakhstan, and Turkmenistan have made considerable efforts to ensure their competitiveness in certain areas, including the above-mentioned sphere of economic activity. It is no secret that the main reserves of Caspian Sea oil are located in the territory of Kazakhstan that is the leader in its production nowadays. Moreover, the transportation of produced raw materials is mainly oriented to the Baku-Tbilisi-Ceyhan pipeline, i.e. bypassing the territory of the Russian Federation.

Additionally, there is an increase in the activity of the shipbuilding enterprises of Iran, Azerbaijan, and Kazakhstan with the growth of production potential which may result in loss of lead by Astrakhan shipbuilding industry, that is cluster-forming for the region's economy, and Astrakhan may be driven from the offshore shipbuilding market (Karlina & Chirkova, 2008).

It should also be emphasized that the Baku-Tbilisi-Kars railway, launched in early 2018, raised the appeal of rail transportation through Kazakhstan and Turkmenistan to China, which may cause a risk of reducing the transit of goods through Russia from China to Europe (Regnum, 2018).

In this context, the development and implementation of a mutually beneficial integrated industrial policy, that contributes to the development of the economic potential and security of the Caspian Sea area, rather than the competition with the Caspian Sea states is advantageous for Russia as a whole and the Astrakhan Region in particular. To accomplish this, it is necessary to study the conditions and obstacles for such integration and develop an industrial cooperation strategy.

2 ANALYSIS OF INDUSTRIAL DEVELOPMENT FACTORS

The industrial cooperation strategy should be formed regarding the model of long-term industrial policy of the region which can be elaborated and proved with the production function tools.

The production function, enabling to obtain the generalized quantitative characteristics of the economic system, which can be used to analyze, evaluate and predict the development trends and changes in the production process, is defined by L.L. Terekhov as an economic and mathematical expression of the dependence of production activity results on the indicators-factors that determined these results (Terekhov, 1974).

This tool can make it possible to determine and quantify the relation between the result of production (output, gross domestic product, profit, etc.) and the technical, natural, social, and economic factors that provide this result. In modern research, the development of neoclassical economic theory, as noted by G.B.Kleiner (2003), contributed to the use of production functions for arbitrary economic systems of micro-, meso-, macro- and mega-economic levels. Besides, one of the important uses of production functions is to apply them for identifying and evaluating the quantitative and qualitative components of economic growth, determining the contribution of growth factor groups to the production dynamics of the economic system.

The study of patterns and development trends in the industries of the Astrakhan Region with the application of production function tools showed the following.

To characterize the industry of the Astrakhan Region, it should be pointed out, first of all, that it is the leading branch of the regional economy. The volume of industrial production in different years makes 65-70% of the total gross regional product; therefore, the industry largely determines the efficiency of resource use (natural, material, labor) and production and scientific-technical potential of the region.

Table 1 shows the dynamics of the indicators of the Astrakhan Region industry for the past decade (2009-2018). Over the past decade, the industrial output of the region has grown 7 times. Comparably, the price of fixed assets of the industries increased by 5.8 times (Figure 1).

Table 1 – Indicators of industrial production in the Astrakhan Region (Federal State Statistic Service, 2019)

Indicators	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Industrial production output in actual prices (mln. RUB), including:	62969	76689	95724	125356	162313	173012	211627	227799	313284	441883
- extraction of mineral resources	18548	22508	32246	68393	93638	100786	125060	137266	226961	346022
- processing plants	33631	40938	47863	39812	48551	48602	61014	61189	53839	61946
- production and distribution of electric power, gas and water	10790	13238	15615	17150	20124	23624	25553	29710	32484	33915
Average number of employees (person), including:	50581	48681	46221	45410	45635	44211	42300	38800	42994	38000
- extraction of mineral resources	4889	5007	5071	4946	4941	5133	5000	5000	13243	5300
- processing plants	32117	30115	28261	27643	27941	26421	25300	22500	15464	19100
- production and distribution of electric power, gas and water	13575	13559	12885	12820	12752	12657	12000	11300	14287	13600
Fixed assets for the end of the year (mln. RUB), including	119945	178530	217954	241877	268273	182235	390807	458634	544471	691673
- extraction of mineral resources	68930	117929	143260	158722	169791	116364	287054	347246	431144	562411
- processing plants	21333	24497	26232	29701	30161	13006	30791	35732	32824	42041
- production and distribution of electric power, gas and water	29682	36104	48462	53454	68321	52865	72962	75656	80503	87221

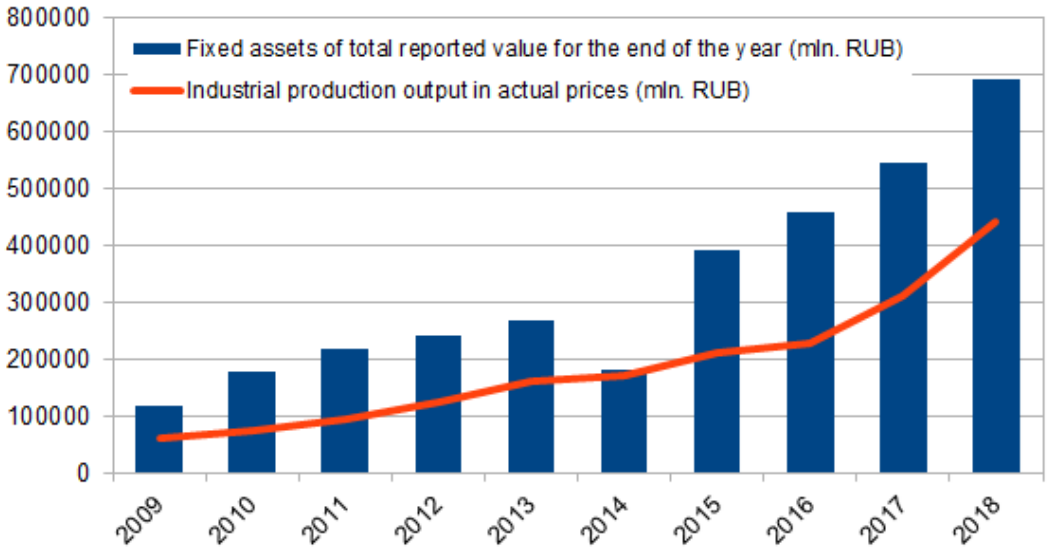

Figure 1 – Dynamics of industrial production output and fixed assets of industry (mln. RUB)

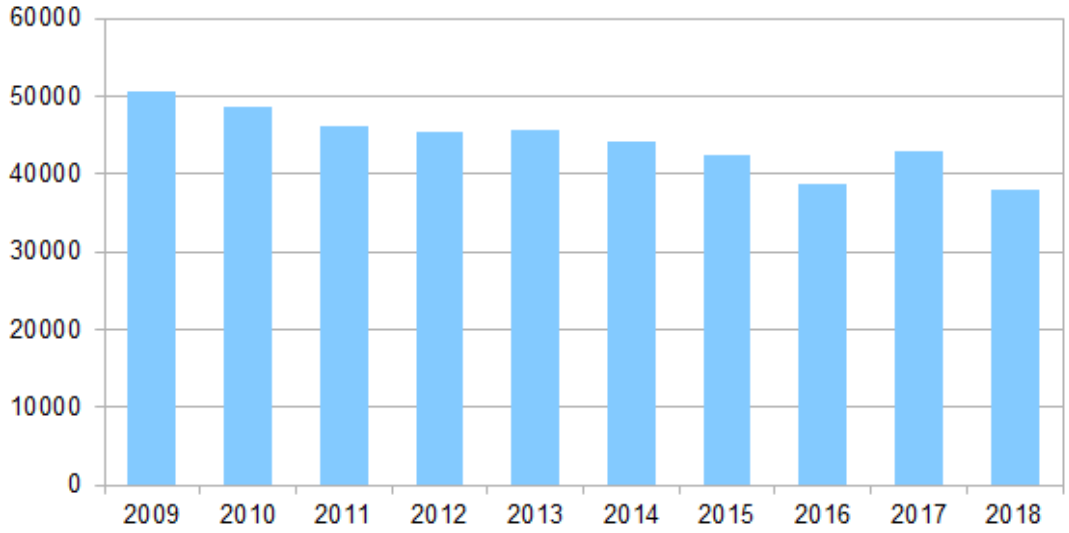

Figure 2 – Average number of employees in industrial production (person) of the Astrakhan Region

Against the growth in the gross output and price of fixed assets, the number of people employed in industries has decreased by 25% in 2009-2018 (Figure 2). In this case, it is worth noting that the industrial production of the region employs slightly less than 20% of the total number of employees in the Astrakhan Region economy.

The structure of industrial production underwent a major change during the period of 2009-2018 (Figure 3).

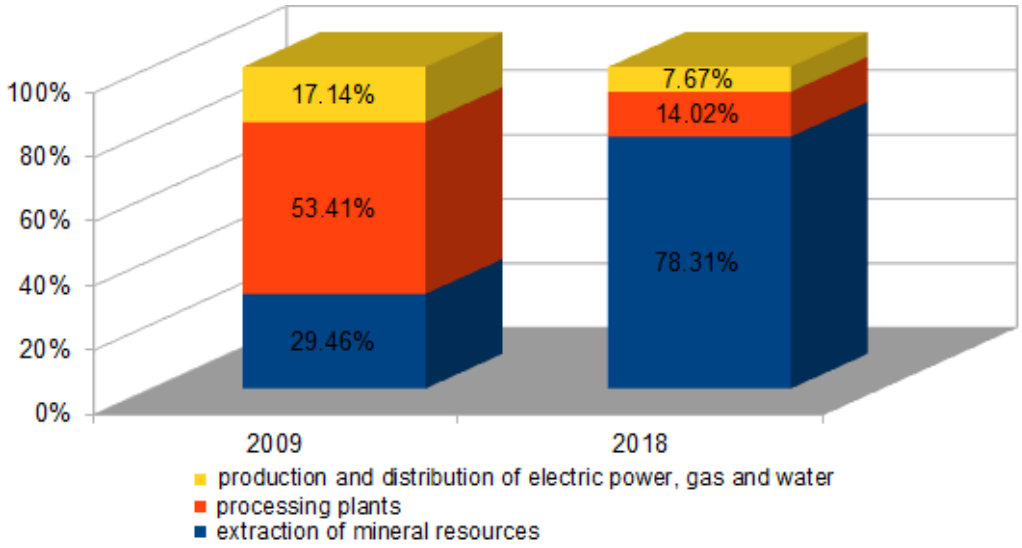

Figure 3 – Ratio of industry branches to the total industrial output (%)

Even 10 years ago, the processing plants accounted for slightly more than 50% of the total industrial output. Currently, the production output of the Astrakhan Region makes 78.3% of the extraction of mineral resources.

There are also changes in the structure of employment in the industry branches but less considerable (Figure 4). The largest number of employees is recorded in processing plants, the smallest - in the extractive industries. However, the study shows that the number of employees in the industry “extraction of mineral resources” increased from almost 10% to 14% in the period from 2009 to 2018, in the industry “production and distribution of electric power, gas, and water” the number grew by almost 9 percentage points, and in the industry “processing plants” the number of employees significantly decreased from 63.5% to 50.3%.

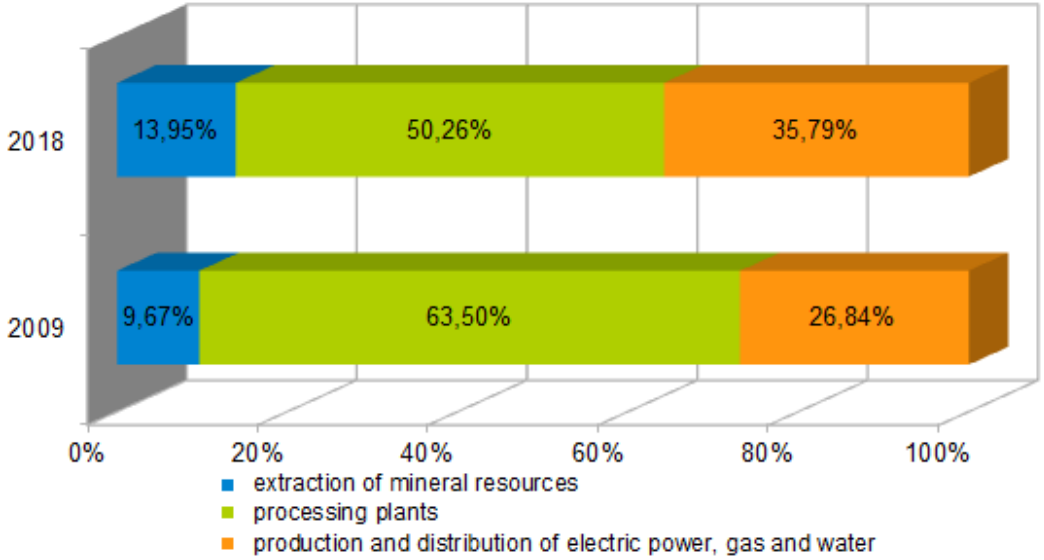

Figure 4 – Structure of the employment in the industry branches of the Astrakhan Region (%)

Such a structure of employment is determined by the nature of technologies used in various branches of industrial production - labor-intensive and capital-intensive. The nature of the applied technologies can be assessed using some parameters of the production function.

The Cobb-Douglas production functions for the regional industries of 2005-2014 were made by the authors in their earlier studies. The production functions for the industries of the Astrakhan Region are presented in Table 2.

Table 2 – Production functions for the industries of the Astrakhan Region

Industry branch	α^*	β^*	e^{a0*}	R^2	F	Production function
1	3	4	5	6	7	8
Entire industry including:	0.474* (0.346)	-1.469 (0.997)	$e^{21.65}$ (14.516)	0.8081	14.740*	$Y=e^{21.65}\cdot K_t^{0.474}\cdot L_t^{-1.469}$
- extraction of mineral resources	1.299* (0.358)	1.963 (6.038)	$e^{-21.268}$ (53.958)	0.718	8.89*	$Y=e^{-21.268}\cdot K_t^{1.299}\cdot L_t^{1.963}$
- processing plants	0.110 (0.335)	-0.934 (4.602)	$e^{19.196}$ (9.02)	0.521	3.81	$Y=e^{19.196}\cdot K_t^{0.11}\cdot L_t^{-0.934}$
- production and distribution of electric power, gas and water	0.589* (0.117)	-4.119* (0.907)	$e^{42.372}$ (9.369)	0.936	51.55*	$Y=e^{42.372}\cdot K_t^{0.589}\cdot L_t^{-4.119}$

**coefficient standard errors are given in brackets*

Table 3. Total average aggregate performance indicators for the regional industries

Industry branch	α	β	$\alpha+\beta$	Change in production performance	Production technology
Entire industry	0.474	-1.469	$\alpha+\beta < 1$	decrease	capital-intensive
Including:					
- extraction of mineral resources	1.299	1.963	$\alpha+\beta > 1$	increase	labour-intensive
- processing plants	0.110	-0.934	$\alpha+\beta < 1$	decrease	capital-intensive
- production and distribution of electric power, gas and water	0.589	-4.119	$\alpha+\beta < 1$	decrease	capital-intensive

The parameters α and β show the value of the average annual growth of the final product per 1% of the growth of the corresponding production factor, assuming the invariability of the other factor. As it is seen, the initial pre-condition accepted by Cobb and Douglas as α+ β = 1 is not valid for any industry. The total average aggregate performance indicators for the regional industries are presented in Table 3.

Generally, α+β < 1 for the industry which shows the decrease in the average aggregate performance indicator for the period under review. Economically, we can talk in this case about the negative effect of expanding the production scale. The output increases more slowly in comparison to the growth of costs of production factors; their total efficiency decreases.

The negative effect of the production expansion takes place in the industries of the Astrakhan Region dealing with the production and distribution of electricity, gas, and water and processing plants. In such an industry as the extraction of mineral resources, the obtained parameters of production function are α + β > 1, and this means that the average aggregate indicator of efficiency in the specified industries rose, i.e. there was the positive effect of the expansion of production scale.

For the industry as a whole, as well as for the processing plants and production and distribution of electric power, gas, and water, the labor elasticity is negative which means the inverse relationship between the dynamics of production output and the dynamics of the number of labor resources. As the labor resources employed in the industry are decreasing, the production output in overall has grown over the past 10 years.

The dynamics of production volumes in the industry of the Astrakhan Region was mostly influenced by the reduction of labor resources and less significantly by the increase in the price of fixed assets. The high elasticity of production output in the labor of all the branches indicates this (The indicator β in Table 3 to the modulo is much higher than indicator α). As the indicator β is negative and α is positive, it is possible to draw the conclusion that the industry of the Astrakhan Region is characterized by using the capital-intensive technology. As Table 3 shows, α > β for every industry branch except for the extraction of mineral resources. This means that each percent of growth rate in capital gains, relative to labor, provides a greater increase in output growth. This fact can be considered as indirect evidence of the more efficient use of capital in the industry of the Astrakhan Region. The technology in the industry of extraction of mineral resources is characterized, on the contrary, as labor-intensive.

The calculation of the parameters of production functions demonstrates that the production performance in the Astrakhan Region is not high; there is a de-intensification of production and economic growth.

One of the important trends in the implementation of production functions is to use them for analyzing the factors or causes of economic growth. Such analysis is aimed at identifying the quantitative and qualitative components of economic growth. As it has already been discussed, the use of production functions makes it possible to solve the fundamental task of assessing the separate influence on the economic growth of different groups of factors.

It is traditional to divide the factors of economic growth into extensive and intensive ones. This classification is grounded on the nature of the economic growth process.

Under the influence of extensive factors, economic growth is achieved due to a change in the quantitative characteristics of the production factors introduced into the economic system by maintaining qualitative characteristics at the same level. The extensive growth sources include:

- increase in the volume of introduced production assets maintaining the current level of technology, i.e. increasing the capital-labor ratio;
- increase in the number of employees in the production with their constant professional qualification characteristics;
- increase in the volume of consumed material resources without changing their quality.

Consequently, the extensive factors can be defined as an increase in the saturation degree of the production system with the production means. The production can be driven up in an extensive way when unused production factors are available.

Regarding the intensive growth factors, it can be mentioned that they are characterized as factors

of a higher order than extensive ones, since the influence of intensive factors on the economic growth implies the improvement of the quality of production factors. The effect of these factors is to reduce the costs per unit of output. The main components of this group of factors are:

- improvement of the characteristics (both technical and technological) of existing and introduced fixed assets;
- advances in the structure of fixed assets: increase of active part of fixed assets, the share of specialized and automated equipment, optimization of the age structure of fixed assets;
- growth in capital productivity of fixed assets;
- growth of application rate fixed and current assets;
- upgrade of the level of qualification, professional training and refresher training and the accumulation of experience by employees;
- improvement of labor productivity due to the development of the results of scientific and technical progress and the organization and working environment;
- expanding of human capital, i.e. development of the educational potential of employees;
- rationalization of redistribution of production means and enlargement of its scale which causes the effect of positive returns to scale;
- introduction of finished cycles into the production, concentration, and specialization of production.

So, it is possible to distinguish 3 subgroups in the group of intensive factors: a) increase of the efficiency in using fixed and current capital; b) improvement of labor efficiency; c) emergence of returns to scale.

The concepts of “intensification of production” and “economic efficiency”, which are often identified by many researchers, need to be distinguished, as noted by A.I. Anchishkin in the 1970s (1973). The differences lie in the economic sense of these criteria. The economic efficiency describes with its indicators the ratio of output (average or limiting output ratio) to the production factors that provide this output. However, this relation can vary over time, which enables to track the progress of performance indicators. In contrast, the intensification of production through its criteria shows the ratio of the increase in production due to the change in the economic efficiency of production factors to the increase in production volumes provided by the quantitative increase in the introduced factors of production. The production intensification can also be described by the comparison of the growth of production volumes due to the change of the efficiency of production factors to the total growth of production volumes.

Thus, these concepts are distinguished in the view of the state of dynamics and statics. The production efficiency can be calculated both in a static and in a dynamic condition, but the level of production intensification is only a dynamic concept. As a result, the production intensification characterizes, among other parameters, the process of dynamic changes in production efficiency and allows us to determine the relative contribution to the increase in production of efficiency changes.

At the same time, the improvement of production efficiency, when the extensive sources of economic growth expand rapidly, does not mean its intensification, but the intensification of production is possible, even if the growth rate of production efficiency drops. This can happen in situations when the extensive sources of growth decrease or their expansion rate are lower than the growth rate of economic efficiency.

The analysis of the industry development based on the production function made it possible to single out another group of factors, the so-called unidentified growth factors. Klass A. and Chetyrkin E.M. describe this combination of factors as “disembodied technological progress” (1986). In the authors’ opinion, this interpretation is too narrow because this group of factors includes only technical and technological innovations that are not considered in the price of fixed assets or in the characterization of production employees but involves much more diverse processes.

It is proposed to define this group of factors as “market factors of economic growth”. Under market factors, it is advisable to understand such factors when economic growth is achieved due to a change in the general conditions for the implementation of the reproduction process. These factors should include:

- improvement of management processes and organizational and technical forms of

production;
- structural and sectoral shifts in the economy;
- fluctuations of economic conditions: business activity, the legal framework for business activity, consumers' purchasing power and demand, parameters of production market factors;
- changes in the socio-demographic situation (fertility dynamics, changes in the age structure of the population, etc.);
- qualitative changes, such as technical innovations which are not reflected in the characteristics of the fixed assets and labor involved in the production process;
- the level of rationality in the expenditures for research and development activities, as well as the relation between theoretical developments and their practical use;
- change of conditions and peculiarities of forming the used production factors;
- change of priorities and directions of national and regional policy.

So, the intensive factors represent the qualitative changes that can be quantified for a specific size and composition of the used production factors. Unlike intensive factors, the market factors of economic growth are those that can be measured only by the degree of their combined influence, but it is impossible to determine the contribution of the single components of those total market characteristics that determined the conditions of reproduction in a given period.

The further in-depth analysis of the industry of the Astrakhan Region reveals its major problem areas:

1. significant wear and tear of fixed assets;
2. insufficient application of existing and additional production facilities in a number of industries of the Astrakhan Region;
3. limited demand for products of local producers;
4. achieving the production concentration limits in some cases;
5. inefficient management, etc.

According to the estimates of the reliable Russian magazine "Expert" which annually studies the investment climate in the Russian regions, the Astrakhan Region (for the end of 2017) is a 3B1 group region with reduced investment potential and moderate investment risk (Expert, 2017). At the same time, the region moved from the 61st to 63rd place in terms of risk level for 2016-2017 and from the 58th to 60th place among all regions of the Russian Federation in terms of its potential level.

Evaluating the components of investment risk and potential, the credit rating agency "Expert RA" uses about 200 initial quantitative and qualitative characteristics. From the investors' point of view, the most significant is the infrastructure, production, labor and consumer potential. At the same time, the investors consider the legislative, financial and political risks the most significant. The lack of infrastructure is one of the main problems that reduce the investment appeal of the region for investors. In accordance with the methods of the credit rating agency "Expert RA", the Astrakhan Region took 56th place among all the subjects of the Russian Federation in terms of infrastructure potential (Expert, 2017).

3 CONCLUSIONS

The determination of the role of factors using the production function and, consequently, the sources of growth, enables the use of this analysis and forecasting tool to set the general future problems of economic growth. Naturally, the calculation of "factor contributions" is not absolute and only possible as the application of production function tools for these purposes is based on the acceptance of certain conditions.

Taking into account the results of the analysis, it is possible to conclude that nowadays there is a need to increase fixed assets of the industry, especially since their depreciation is quite high, and to optimize the number of staff in most industries. The influence of fixed assets on the change in the production output is not greatly significant in most cases, which, in the authors' opinion, is associated with a low degree of implementation of existing and additionally introduced production capacities in most industries of the Astrakhan Region. The low degree of the implementation of production capacities is caused by the following reasons: limited demand for products of local manufacturers, high deterioration of fixed assets, and achievement of production concentration limits. These and other reasons (for example, inefficient management) lead to the de-

intensification of production, i.e. the increase in the introduced resources results in the decrease in production effectiveness. The inflow of investment into the industry is reasonable, and this is linked with the need to form a new industrial base for industrial production in the long term.

Consequently, the solution to the problems, that the economy of the Astrakhan region faces, first of all, should be associated with the increase of the introduction of intensive factors for economic growth, i.e. the intensification of production.

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Received for publication: 16.12.2019
Revision received: 23.12.2019
Accepted for publication: 10.01.2020

How to cite this article?

Style – **APA** *Sixth Edition:*

Arutyunyan, S., Gadzhieva, E., & Mineva, O. (2020, January 15). Research on industrial development factors for the formation of industrial policy of the Astrakhan region (Russia). (Z. Cekerevac, Ed.) *MEST Journal, 8*(1), 15-24. doi:10.12709/mest.08.08.01.03

Style – **Chicago** *Sixteenth Edition:*

Arutyunyan, Svetlana, Elena Gadzhieva, and Oksana Mineva. 2020. "Research on industrial development factors for the formation of industrial policy of the Astrakhan region (Russia)." Edited by Zoran Cekerevac. *MEST Journal* (MESTE) 8 (1): 15-24. doi:10.12709/mest.08.08.01.03.

Style – **GOST** *Name Sort:*

Arutyunyan Svetlana, Gadzhieva Elena and Mineva Oksana Research on industrial development factors for the formation of industrial policy of the Astrakhan region (Russia) [Journal] // MEST Journal / ed. Cekerevac Zoran. - Belgrade – Toronto : MESTE, January 15, 2020. - 1 : Vol. 8. - pp. 15-24.

Style – **Harvard** *Anglia:*

Arutyunyan, S., Gadzhieva, E. & Mineva, O., 2020. Research on industrial development factors for the formation of industrial policy of the Astrakhan region (Russia). *MEST Journal,* 15 January, 8(1), pp. 15-24.

Style – **ISO 690** *Numerical Reference:*

Research on industrial development factors for the formation of industrial policy of the Astrakhan region (Russia). ***Arutyunyan, Svetlana, Gadzhieva, Elena and Mineva, Oksana.*** *[ed.] Zoran Cekerevac. 1, Belgrade – Toronto : MESTE, January 15, 2020, MEST Journal, Vol. 8, pp. 15-24.*

MEST Journal
DOI 10.12709/mest.08.08.01.04

TENDENCIES FOR THE DEVELOPMENT OF HOTELS IN UKRAINE UNDER CRISIS SITUATIONS

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JEL Category: **M11, O32**

Abstract

Any economic crisis leads to increased risks, increased competition and deterioration of the financial position of many hospitality businesses. A weak hotel management system, inadequate customer relationships, and revenue management often trigger the crisis of the hotel business. The adverse economic environment is forcing hotel managers to revise their development strategy, namely, to optimize their operations by reducing costs and using marketing tools. Those enterprises that manage to reduce costs without losing the quality of the services provided are in the most demand and competitive in a crisis. Improving the quality of the hotel offer to the level of international standards, expanding markets and training specialists in accordance with the requirements of world standards is indispensable to ensure the development of tourism in the context of deepening relations between Ukraine and the European Union. The development strategy of the industry requires state financial support in the main areas: attracting tourists to selected target markets; bringing national standards, safety standards, quality of goods and services in line with international requirements. In the article, the authors form their own point of view on the efficiency of functioning of the hotel enterprise in a crisis. The authors study the main trends in the development of the hotel business; analyze the hotel business in Ukraine based on statistics and expert opinions. The methods of management of the hotel enterprise during the crisis are presented. The authors have developed a three-level model of functioning of hotel enterprises in Ukraine in times of crisis, which will help to improve the financial situation for managers and managers of hotel enterprises in times of crisis.

Keywords: *hotel enterprise, crisis, management, hotel business, crisis management, analysis, strategic management.*

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1 INTRODUCTION

The economic crisis is affecting all areas of business, including the hospitality business. Developing an effective development plan is the primary way of surviving a hospitality business in an unfavorable economic environment. The problem of hospitality business development in times of economic crisis has become an urgent task for hotel business owners in the international market. Thus, the purpose of this study is to attempt to form a model of functioning of a hotel enterprise that may take place in the international tourism market in times of crisis. A literature review of the subject shows that the vast majority of authors consider the problems of crisis management and effective management of the enterprise as a whole, without a sectoral sign. (Shad, K., & Fong Woon, L., 2015).

One of the definitions of crisis management, which J. Darling refers to says: "Crisis management is defined as a set of functions or processes for identifying, studying and forecasting crisis problems and outlines specific ways that would allow an organization to prevent or deal with a crisis." (Essays, 2018).

P. Lagadec believes that "effective crisis management practices are needed to avoid or reduce such unforeseen impacts." As the economic environment grows in complexity and uncertainty, crisis management policies require considerable effort for organizations to learn, and on the other hand, help organizations to determine the determinants of their ability to survive or adapt. (Kopia, J., Just, V., Geldmache, W., & Bußian, A., 2017).

If we talk about a particular industry - in this case, hospitality business, many modern researchers, considering the management of the hotel business in times of crisis, believe that, first of all, we should dwell on the conditions of operation of the hotel business enterprises. First, these are measures to increase sales by forming new hotel products and changing pricing, and second, measures to optimize costs, as these are taken from the best practices of successful hospitality businesses. This opinion is undoubtedly relevant, but it should be noted that the main task in the operation of the hotel company in times of crisis is to maintain competitiveness.

According to Y. Zemlina and O. Lifirenko an important aspect directly related to the emergence of a crisis within the hotel business is the lack of professional qualifications of employees, which entails accountability to owners for the consequences of management decisions and the financial result of operations. (Zemlina, Y., & Lifirenko, O., 2019)

In our opinion, the efficiency of functioning of a hotel enterprise in a crisis is a combination of business processes, accounting of internal and external factors influencing the crisis, as well as constant assessment of the effectiveness of the existing strategy at the level of organizational structure, marketing, management system of the enterprise as a whole.

2 MODERN TENDENCIES OF HOSPITALITY BUSINESS DEVELOPMENT

Currently, new conditions and trends are emerging, which largely determine the efficiency and competitiveness of hotels in times of crisis (Table 1). (Zemlina, Y., & Lifirenko, O., 2019; Kobyak, V., & Lvovna, I., 2015).

Hospitality business, like any other, depends on external factors, globalization processes, and scientific and technological progress, the latest modern technologies fundamentally change the model of consumer behavior, their preferences, and the conditions of functioning of enterprises. It should be noted that in the paradigm of the interaction of the hotel enterprise, both with external and internal factors, there is a crisis, which can be caused by:

- quality of services provided;
- market demand;
- price for the service;
- the material base of a hotel enterprise.
- external factors that do not depend on the hotel sector (military action, natural disasters, etc.).

Table 1 Tendencies of hotel business development

Tendency	Description
Strengthening the role of particular sectors of the economy	According to expert estimates, in the future, the hotel will mainly serve the luxury market and the group market, while the focus of private and business travel will shift to rental services
Development of new forms of hotels	A vivid example of this trend is the creation of capsule hotels, first opened in Japan in 1979 and already presented in the Ukrainian hotel services market.
Development of robotic technology and the introduction of infrared sensors	For example, AloftCopertino offers messenger service. Communication of guests with the robot is carried out by means of the robotic mechanism “A.L.O. Botlr” with 4G support, WI-FI module and a 7-inch tablet. The use of infrared sensors helps staff to make decisions, such as when they need to clean a room
Implementation of innovative software products	Products for Hotel Enterprises - SAAS Technology (Cloud). The main advantage of such technologies is the lack of requirements for the purchase of expensive equipment and software. Access to the system is via an Internet browser from anywhere in the world
Mobile Marketing development and orientation on “millennium” generation	Mobile applications have been successfully used to optimize interaction with hotel guests (reservations, food reservations, taxis, etc.), as well as for internal interaction of hotel staff (for example, the task of rooms cleaning, and after cleaning the maid sends a message about the readiness of the room to check and before new guests arrive)
Improvement of hotel business service	Encourages the hotel business representatives to offer extended content of the hotel services offered, to enhance the service component in their work
Globalization and integration of the hotel business	Creation of tourist corporations and hotel chains. There are well-known international hotel brands in the Ukrainian market (Radisson SAS, Hilton, Wyndham Hotel, HELIOPARK Group, InterContinental Hotels Group, and others)
Accounting of tourist flow peculiarities	Accounting for the heterogeneity of the flow and the factors that form it, allows you to offer the market needed for quality, volume and quantity of services and to combat the factor of "seasonal demand"
Deep personalization of service and complete concentration on customer requests and needs	It is manifested in the presence of a wide range of additional services, in the use of RFID technology, which identifies the guest before the service is provided (TouchPoint from OneLabSolutions), biometric identification, electronic lock systems, the use of the principle of greening in the automation of life support systems.

3 ANALYSIS OF THE STATE OF HOTEL BUSINESS IN UKRAINE

The President's statements about the legalization of the gambling business, the talk about the Ukrainian promotional company and the search for the right hotel concept are the topics that are currently actively discussing the entire hotel real estate market. Despite the crisis period and the undeniable decline in the activity of foreign tourists at the beginning of the year, the sector does not lose hope to finish 2019 with good indicators.

During the first half of 2019, it was a lack of guests at all Ukrainian hotels. This is not surprising: on the one hand, the declared state of war has cut down the ranks of those wishing to see Ukraine,

then the election is one, the election is the other - business activity has dropped significantly, which immediately affected the average occupancy of the rooms. Thus, according to CBRE Ukraine analysts, according to the results of 8 months of 2019, the average occupancy rate of Kyiv hotels was 54.1%. The highest occupancy rate was observed in the period April-July when it averaged 58.8%. The elections were over, and with them came a certain understanding of the vectors of further movement. (CBRE Ukraine, 2019).

According to Cushman & Wakefield in Ukraine, the most turbulent period has affected 4-5-star hotels. Consumption for this category dropped to 43% from 46%. It is important to note that this trend is explained by the seasonality factor. Since the Kyiv hotels are mainly focused on the business segment, the summer period is characterized by a lull, but since the autumn business activity increases, and by the results of the year, the overall figures can even become equal. (Cushman & Wakefield, 2019).

To explain the decline in the occupancy of this category is quite simple: you will not find tourists for all the hotels in this class. At least now, when Ukraine is not yet popular enough for a foreign guest, including business players. It is well known that this category of visitors is designed for "fours" and "fives". First, crowds of international investors have not yet rushed to us, and those who come have already chosen permanent hotels. Second, the strengthening of the hryvnia against the dollar reduces the attractiveness of such hotels for foreign tourists in the context of room rates. On the other hand, the strengthening of the national currency is a positive factor for domestic tourists, which has a positive impact on the operating results of mid-range and economy hotels.

Investors are now forced to more practical approach the segments and pay attention to the economy in the first place. Confidently developing budget hotels - 3 stars, 3+. First of all, because not only foreigners but also domestic tourists and businessmen can stay in such hotels, as the practice has shown. However, in some regions, there is already a demand for 4-star hotels. ”

Despite some variations and smaller hotel occupancy rates in some places and regions, the market as a whole is showing good financial results and a trend towards further growth. The statements of the President of Ukraine on the legalization of gambling and construction of new resort cities will accordingly lead to the increased interest of investors in new hotel projects. In addition, if the relevant tourism reforms are implemented and the budget allocated to the promotion of Ukraine as a tourist destination abroad, we will see even greater investment expectations in the hotel segment.

According to CBRE Ukraine, the average cost per room (ADR) in Kyiv was $ 80 (-2.3%). The average rate of return of a single room (RevPAR) was $ 43 (-5.3%), which is associated with lower demand for rooms. Thus, as of the end of August 2019, since the beginning of the year, the total number of rooms sold was 826 362 rooms, whereas in the previous period last year 836 874 rooms were sold in Kyiv. (CBRE Ukraine, 2019).

Cushman & Wakefield in Ukraine noted that for the luxury category, upper-upscale, upscale there was an increase of 4 to 22% in the first two quarters of 2018. It decelerated to 5% by the third quarter of 2018, and at the end of 2018 - the beginning of 2019 has changed to a 20% decrease in room rates on average in dollar terms period to period.

The midscale and economy categories showed the opposite dynamics, as they showed an increase in the average price per room in all periods from the first quarter of 2018 to the second quarter of 2019, with growth being stable, which is explained by the greater opportunity for growth due to the low base for comparison and, accordingly, great potential and margin of safety in the segment. It is important to note that despite the contradictory trends of the first half of 2019 if we compare the price dynamics for the room with 2017, it is positive. (Cushman & Wakefield, 2019).

While Kyiv is looking for new ways to attract foreign tourists, the regions are living their lives. Domestic tourists dominate there, for whom the seasonality factor still plays a role. Change this attitude hotels of new formats are capable, where they offer a comprehensive service, quality service, interesting entertainment regardless of the time of year.

Uzhgorod, Chernivtsi, Lviv, Chernihiv, Kyiv, Odesa are the most attractive cities for tourists. The reconstruction of 4 buildings, which will become the Best Western Plus Market Square hotel for 70 rooms, is underway in Lviv. It is also possible to highlight the growing market image in the region of Bukovel-Yaremche-Skhidnytsia and Transcarpathia. The Black Sea and Azov regions are actively but not professionally developed (without the involvement of experts and the use of world experience).

It is particularly interesting that in Western Ukraine, a number of political events and decisions have had a much greater impact on the market. Many projects have been terminated and hotel real estate players have chosen waiting positions.

According to Glory Hotels Group, in Transcarpathia, since the beginning of six months, there has been some market downturn, in particular, because of the military conditions in Ukraine. In winter, the occupancy rate of hotels is less than 30%, which is a very unfortunate situation with the pricing policy that has been in the region for the last three years. This is heating, snow removal, service and more. The download was minimal, which caused the hotel owners to sell their assets. The situation changed somehow at the end of June, prices started to rise and the average room rate increased to $23 per day for 2 people without food."

Major players in the hotel market of the country say that the coldness of investors is easily explained by the fact that the payback period of the project is from 5 to 13 years, depending on the correct location, effective concept, technologically correct project, the expertise of the team that manages the business. ROI rate is 7-13%. This interval has not undergone significant changes over the last 2 years, as the market conditions are relatively stable and inflation processes are observed, both in the expenditure part and in the revenue side, balancing each other. Still, there is a lack of a professional approach in the market and experts (consultants, technologists, etc.) involved in the project immediately.

Among the major drivers of the sector, which boomed in the first half of the year, hotel market players and experts call the steady increase in the attractiveness of Ukraine in the eyes of foreign tourists. There are many factors contributing to this, but the state-owned promotion campaign has not been well-considered and well-defined. We still do not have one. All outside advertising is created rather by the forces of different people, organizations, as well as the business itself. These are all separate voices that need state-level support and support.

Over the last year, Ukraine has achieved the highest growth in the region by the TTSI index, rising by 10 points and taking 78th place. Ukraine has improved its business climate (from 124 to 103 places), security indicator (from 127 to 197 places), openness to foreigners (from 78 to 55 places) and general infrastructure (from 79 to 73 places). In general, the main task of industry development is the active participation of the state in the strategy of comprehensive support to the sector. (Glory Hotels Group, 2019).

In our opinion, one of the urgent problems is the lack of promotion of tourist attractions of Ukraine abroad at the interstate level, the lack of privileges and supporting programs for the development of various hotel segments. Lack of major congresses and assemblies in major cities, as well as poor development of transport infrastructure and very poor quality of Ukrainian roads.

As it is noted by Marina Leo, partner DEOL Partners, CEO of 11 Mirrors Design Hotel and Senator Hotels and Apartments, "I am confident that it is not adding strength to the hotel segment and adopted Law on Amendments to the Tax Code of January 1, 2019. It introduces new rates for tourist tax and rules for its management. In the future, the entire hotel sector may experience these changes. After all, the rate is charged not on the cost of settlement, but on the minimum wage, which increases every year. Therefore, the conditions for tourists are constantly changing, and any changes cause a negative reaction in people. Moreover, this is especially felt in the segment of hostels and low-cost accommodation." (Property Times, 2019, Jan. 11).

In addition, unlike many developed European countries, we still do not have a reduced tax rate on services related to the temporary

accommodation of tourists. It remains at 20%, although lowering the rate will help attract investment, create new jobs, grow the industry and improve the business climate and economy of the country as a whole. We are convinced that the more tourists the country receives, the higher is income and lower are costs.

CBRE Ukraine cites the latest World Tourism Council study on Ukraine. According to it, the direct contribution of the tourism industry to the GDP of Ukraine amounted to 1.5% of the total GDP in 2017, and given the growth forecast for 2018-2028, this figure will reach 1.7% of GDP in 2028. For comparison, in France, the direct contribution of the tourism industry to the country's GDP was 3.6% in 2017, with a forecast of 4.0% in 2028 (CBRE Ukraine, 2019).

Hotel business experts are convinced that the second half of 2019 may be the best for the hotel's real estate market. First, it is expected that the market will gradually develop in the future, taking into account the positive trends in the economy and improving economic expectations. Economic expectations indicator, which reached 111.5% at the end of Q3 2019 (+ 9p since the beginning of the year). The opening of new destinations for international flights at Boryspil and Kyiv airports will help to improve the situation in the industry.

According to the statistics of the State Aviation Service for January-August 2019, the volume of passenger transportation of Ukrainian airlines increased by 10.7% compared to the corresponding period of the last year and amounted to 9.2 million people, including international ones - by 10.9% and amounted to 8.4 million people. Passenger flows through Ukrainian airports increased by 19.4% to over 16 million people, including in the international connection - by 20.7% and amounted to 14.5 million people. (State Aviation Service of Ukraine 2019).

However, given the 1.1% decline in hotel occupancy, the key challenge for the hotel industry is now the development of tourist attraction in Ukraine and Kyiv in the world, when hotel occupancy will be achieved not only through business travel but also through leisure travelers who are interested in sightseeing. With regard to the forecast by the end of this year, there are no significant changes in the operating figures of hotels, and the occupancy rate will remain in the range of 57-59%. The overall supply in the hotel real estate market will also remain unchanged since the new offer by the end of the year consists of small hotels.

Traditional hotels will face significant competition from trendsetter hotels: capsule hotels, as well as interesting hostel concepts. (CBRE Ukraine, 2019).

Hostel development is the current trend in the hotel real estate market and is currently attracting investors. We see that a number of hostels have been recently opened in Kyiv. However, it is important to keep in mind that hostels are an intermediate budget segment that market players fall into until political situation is clear.

At Cushman & Wakefield in Ukraine, one of the major trends that will affect the situation in the sector is mentioned the increasing role of the Internet in making consumer preferences and habits because in the world it is already difficult to find at least one tourist who does not use Google Maps, Amazon, Booking, Tripadvisor, etc. (Cushman & Wakefield, 2019).

In addition, the old formats of hotels that offer only bed and breakfast will remain overboard. The trend includes additional value and additional services, including co-workings. For example, Accor Hotels has announced plans to open co-branding hotels in the WOJO brand. It is a shared space located in bars, restaurants, and the hotel lobby. The target audience of this project is business travelers and freelancers. Bleisure Travel by Millennials is a name given to travel that combines business goals with leisure and is becoming more and more popular, especially among the millennial generation. For example, travelers may first attend a business meeting or conference, but then extend their stay to turn it into a leisure destination.

4 HOTEL MANAGEMENT METHODS IN CRISIS

In order to solve the problems related to the issues of functioning of the hotel enterprises under the conditions of crisis, we have offered the following methods, which are presented in Table. 2.

Table 2 Hotel management methods in crisis (Groh, M., 2014)

Tactical methods	Strategic methods
1. Restructuring 2. Reduction 3. Bankruptcy	1. Merger 2. Innovations 3. Regulation 4. Restructuring 5. Reduction

The first group of methods includes tactical methods. In turn, tactical methods include restructuring, reductions, and bankruptcy. These methods are aimed at the rapid improvement of the financial performance of the enterprise, i.e. overcoming crisis consequences. However, the use of these methods is not always sufficient to eliminate the causes of the crisis.

Another group of methods is strategic. As a rule, hotel managers will not immediately be able to see the results from these methods, but their use changes quality characteristics such as competitiveness, investment attractiveness, customer focus, and innovation.

The main methods include mergers within one network of enterprises at different stages of development and distribution and diversification of activities. This method may be rational if the integration results in significant savings or possible reductions, such as transportation costs.

Innovation is the introduction of modern strategic management approaches in times of crisis. Regulation, in turn, involves the formation of strategic planning and management reporting, the creation of a combined system of financial control and planning, automated accounting systems and the formation of effective marketing activities. These approaches address many of the problems associated with market conditions and the search for new clients and partners in the international market.

Restructuring is a complex method of crisis management that has become widespread in recent times. This method involves changing the organizational structure and strategic management system.

The method of restructuring business processes leads to the reduction of unnecessary links and unnecessary costs of time and money and provides a dramatic increase in the efficiency of activities, such as efficiency, processing time, production costs, etc.

The reduction is another way that can immediately improve the performance of the hotel industry. This is a reduction in overcapacity and a reduction in staff employment in line with real market demand. This method leads to a significant reduction in costs and lower production prices. For example, the hotel and restaurant sector in the UK has about 98.3% of businesses with fewer than 50 employees.

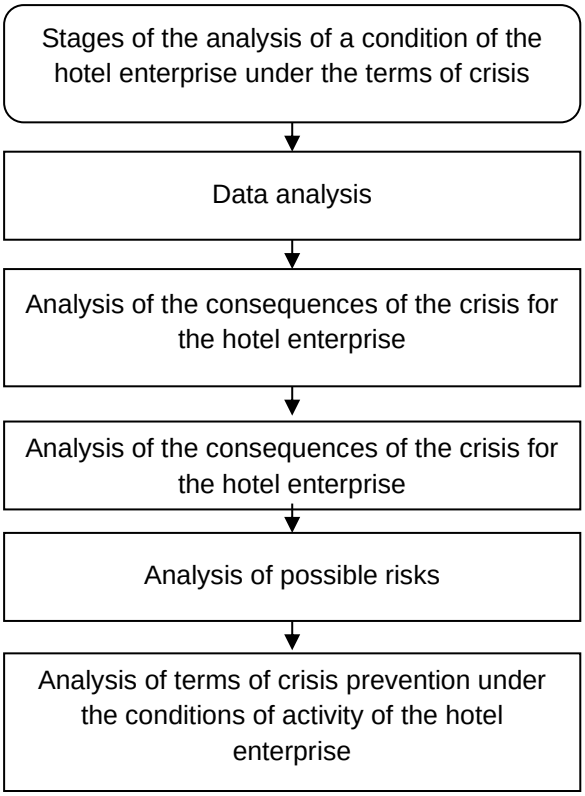
Effective strategic management during a crisis involves a combination of the following elements: the professional knowledge of the employees of the strategic management organization; experience of the anti-crisis activity.

The success of strategic crisis management depends on the timely detection of crises and the application of the most effective methods to overcome it.

Effective functioning in times of crisis is carried out using a number of strategic and tactical methods of strategic management in the aggregation.

5 MODEL OF HOTEL ENTERPRISE OPERATION IN CRISIS

The period when the hotel business experiences some "stagnation" is the perfect time to work on optimizing it. Most leading experts believe that the main purpose of such a procedure should be to reduce overall costs while maintaining the same quality of service.



Let's consider a systematic process of analyzing the state of affairs in crisis management (Fig. 1).

As a result, the following steps can be identified: data analysis (including financial, commercial and service audits); the possible impact of the crisis on the hotel business; possible steps to overcome the crisis; potential risk factors for these actions; terms of implementation of "recovery" events.

Also, the analysis of current affairs of the hotel enterprise can be carried out using an evaluation matrix (table. 3), which represents the main "areas" of the studied business, determined the initial degree of significance (specific gravity), where the manager of the hotel enterprise must evaluate on a 10-point scale each sphere. The total is calculated as the product of the scale and specific gravity score.

Fig. 1 Stages of analysis of the state of hotel enterprise in a crisis (Kizyan, N., & Melyakova, E., 2015)

Table 3 Example evaluation matrix for each alternative (developed by the authors)

Potential	Share	Scale											Result
		0	1	2	3	4	5	6	7	8	9	10	
Management	0.3					+							1.2
Finance	0.2				+								0.6
HR	0.2						+						1.0
Marketing	0.1							+					0.6
Purchase	0.1		+										0.1
Sales of services (products)	0.1					+							0.4
	1												3.9

Thus, it should be noted that the "share" of management is the most significant factor in times of crisis, which solves the problems of the enterprise through crisis management.

Crisis management in business is called a complex of management decisions that are aimed at preventing and overcoming the negative effects of the enterprise. In times of crisis, it is actually about adapting all the hotel's activities to the new economic conditions.

In our opinion, the implementation of crisis management, which is the basis of functioning in the hotel business in times of crisis, should be divided into several stages (Fig. 2).

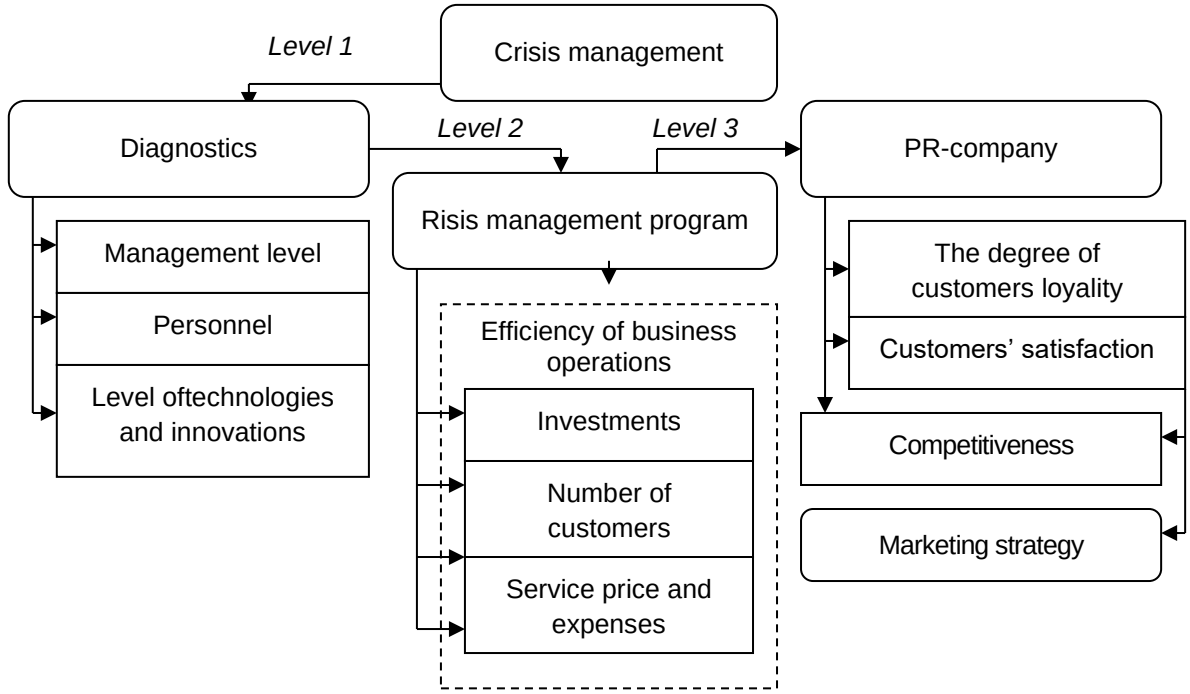


Fig. 2 Model of the functioning of the hotel enterprise in times of crisis (developed by authors)

Let's consider a phased implementation of crisis management activities.

I. Diagnosis. There are three groups of characteristics to diagnose the state of affairs in a hotel enterprise. The first is the basic elements of doing business: the level of management, staff and the level of adaptability and business innovation. For example, when talking about the hotel team, the interest should be the organizational structure, its effectiveness, the lack of duplicate functions. In particular, the manager should know how many people he works for per room. Typically, in 3-star hotels, there is no more than one person, and in 5-star hotels, the figure can range from 1.5 to 2.5 people in deluxe hotels. Comparing its own indicator with the average market, the company understands whether it works effectively or not. In addition to statistics, management needs to analyze the level of competence of staff, the degree of satisfaction of people with their work, motivational measures.

II. Crisis management program. The second niche in which to diagnose in times of crisis is the efficiency of business processes in a hotel enterprise. There are a number of parameters that can be used to analyze operating activities. For example, how much the costs incurred in operating a business can be compared to the revenue generated by a hotel; the extent to which the number of people employed in a particular site is appropriate; how effectively the services of one or the other services of the hotel enterprise are sold. (Kobyak, V., & Lvovna, I., 2015).

III. PR campaign. The third level of diagnostics is the market indicators of the functioning of hotel enterprise, the degree of customer loyalty to the hotel, their satisfaction with the quality of service, the competitiveness of the services offered. Correcting the situation at this level, if the opportunities of the other two were missed, is much more difficult, since the hotel company may already lose its market share, which will undoubtedly affect the profitability indicators.

If the negative effects affect the financial efficiency of the hotel, it loses profit, and therefore profitability has inadequate liquidity indicators. Business rehabilitation measures are aimed at restoring the solvency of the hotel business. This is also a debt restructuring if there are difficulties in repaying loans, improving the liquidity of the hotel's resources, closing the cash gaps, optimizing costs.

PR campaigns also include an effective marketing strategy to attract customers with minimal investment and maximum profit. In this case, the following promotion channels take place when

advertising hotel companies: discounts and promotions for regular and newcomers for the purpose of resale; advertising in the media; cooperation with airports, airlines, large shopping centers; distribution of leaflets, flash mobs in crowded places; Internet marketing.

It is worth noting that the situation in the hotel industry of Ukraine, complicated by the existing hostilities in the east of the country, forces managers to monitor trends and innovate in order to attract tourists at all costs.

Thus, the above functional model will allow having an idea of the necessity of measures during the crisis of the hotel enterprises, a basic set of actions where each individual hotel business will undoubtedly have its own peculiarities depending on the causes of the crisis.

6 CONCLUSIONS

The hotel industry is an important business globally, and current trends and tourism demand are changing it. Numerous trends emphasize the importance of modern hotel business, as the modern tourist is not only satisfied with the basic offers in hotel service but also requires a differentiated and personal service, which becomes the main motive for travel. Because of the existing and ever-expanding variety of hotel complexes, competition is growing in which businesses need to survive. As a result, the operation of hospitality enterprises in times of crisis is a fundamental goal for maintaining the value of the hospitality industry. In the framework of this study, the tendencies of development of the hotel enterprises of Ukraine are revealed and the model of management of the enterprise of the hotel industry during the crisis is developed, which has the basic set of actions necessary for the improvement of the crisis.

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Received for publication: 24.12.2019
Revision received: 07.01.2020
Accepted for publication: 10.01.2020

How to cite this article?

Style – **APA** *Sixth Edition:*

Bagrii, K., & Palamarek, K. (2020, January 15). Tendencies for the development of hotels in Ukraine under crisis situations. (Z. Cekerevac, Ed.) *MEST Journal, 8*(1), 25-35. doi:10.12709/mest.08.08.01.04

Style – **Chicago** *Sixteenth Edition:*

Bagrii, Konon, and Karina Palamarek. 2020. "Tendencies for the development of hotels in Ukraine under crisis situations." Edited by Zoran Cekerevac. *MEST Journal* (MESTE) 8 (1): 25-35. doi:10.12709/mest.08.08.01.04.

Style – **GOST** *Name Sort:*

Bagrii Konon and Palamarek Karina Tendencies for the development of hotels in Ukraine under crisis situations [Journal] // MEST Journal / ed. Cekerevac Zoran. - Belgrade – Toronto : MESTE, January 15, 2020. - 1 : Vol. 8. - pp. 25-35.

Style – **Harvard** *Anglia:*

Bagrii, K. & Palamarek, K., 2020. Tendencies for the development of hotels in Ukraine under crisis situations. *MEST Journal,* 15 January, 8(1), pp. 25-35.

Style – **ISO 690** *Numerical Reference:*

Tendencies for the development of hotels in Ukraine under crisis situations. **Bagrii, Konon and Palamarek, Karina.** [ed.] Zoran Cekerevac. 1, Belgrade – Toronto : MESTE, January 15, 2020, MEST Journal, Vol. 8, pp. 25-35.

MEST Journal
DOI 10.12709/mest.08.08.01.05

SMEs DIGITALIZATION AND THE SHARING ECONOMY

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JEL Category: **D83, L15, L86**

Abstract

The paper analyzes the digitalization and sharing economy influences on the doing business and opportunities of small and medium-sized enterprises. Particular consideration was given to the digital transformation of SMEs in the modern world and to the various aspects of SME strategies in relation to digitalization, identifying four core enterprise groups: Digital Business Defender, Digital Business Prospector, Digital Business Analyzer and Digital Business Reactor. Digitalization was then analyzed as a contemporary worldwide process of improving performance and competitiveness, and its advantages and disadvantages were pointed out. After that, the new digital economy, the sharing economy, is analyzed. The benefits of this approach to resources are particularly emphasized, but also the risks it entails, especially regarding job security. As inevitable, the application of modern information and communication technologies is emerging in the digital economy. The research supports the authors' conclusion that not everything is in technology, but that anything cannot be done without it. The authors also concluded that SME digitalization is influenced by both internal and external factors and that the main internal factor is the owner/manager's attitude towards modern technologies and their willingness to incorporate the technology into the business of their enterprise. A state has emerged as an external factor, which can influence the digitalization of SMEs through various incentive measures. This work can be of use to anyone who is interested in analyzing the business of SMEs in contemporary conditions, as well as to SME managers/owners.

Keywords: *SME, digitalization, sharing, technology, digital economy, digital transformation*

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1 DIGITAL TRANSFORMATION

When talking about digital transformation, it is thought primarily of the process of infiltrating digital strategies and technology in the company. This can subtitle everything, from introducing new devices that would allow employees to work remotely, through creating mobile apps to improve internal communications or work without paper, up to adoption digital data collection solutions. In order to remain competitive, business societies must not ignore the widespread digital revolution. Therefore, companies of all sizes continuously explore the digital transformation and how to properly use available technologies to become more efficient and reduce costs. Many small and medium-sized enterprises (SMEs) have been looking for a long time to find technology that will allow them to work without paper. According to Xerox, in 2017, 81% of the SMEs wished to eliminate paper from their business in the following 12 months (Lobel, 2017). Until the mid of 2019, there were no studies on the realization of this idea, but in any newspaper title, and in any available study, it did not appear any information that any SME eliminated the use of paper from business. It is a too complex and difficult task.

Within this research, under the term "digitalization", it will be considered the integration of digital technologies in all the pores of doing business of SMEs.

Digitalization offers new opportunities for SMEs, including the possibilities of global trade, innovation, and growth. With relatively low costs, SMEs can access knowledge networks and strengthen their competitiveness in the innovation of products and services and improve production processes. This should also be added to a wide range of opportunities that provide big data and their analysis. They help the SME better understand internal processes, customer and partners' needs, and the overall business environment they are in. Digitalization facilitates SMEs' access to skills and talents, as it makes to them available outsourcing and online renting of services as well as links with experienced partners (OECD, Key Issues for Digital Transformation in the G20, Report prepared for a joint G20 German Presidency/OECD conference, 2017). Mobile Banking and online payments also have a positive and important impact on SMEs. All this allows young SMEs to start out as a *lean startup*[1], with small investments and low initial costs.

However, it is not as convenient for SMEs as it might look. Even now, many SMEs are not able to take advantage of digitalization due to restrictions on the adoption of digital technologies. In most countries, differences in accepting digitalization between large companies are small because they are present on the Internet and interconnected. With the decrease in the size of economic societies, differences are becoming larger. The gap is growing when one analyzes participation in electronic trade and the implementation of sophisticated applications. In OECD countries, software applications for business Resource Planning (ERP) for management of business information flows are popular in large companies (78% in 2016), but not in SMEs (< 28%). In many countries, there is also a huge gap in the cloud of computing. (OECD, 2018) This is illustrated in figure 1.

The analysis conducted within the OECD project Going Digital shows that the SMEs' lag in adopting digital technologies is based on a lack of investment in appropriate knowledge-based assets. This includes investing in human resources, research and development, innovation, and organizational changes. Furthermore, SMEs are facing many challenges in terms of digital security and privacy, primarily due to the lack of capacity for evaluation and risk management. (OECD, Going Digital: Making the Transformation Work for Growth and Well-Being, 2017) In overcoming the observed challenges, politics can help a lot. The basic prerequisite is a provision of quality connections and networks, but targeted policies may help the SMEs to accept and implement the digitalization of business more quickly.

[1] Lean startup is the methodology of development of business society and/or product, which aims to reduce the product development cycle and quickly detect whether the proposed business model is sustainable; This is achieved by adopting a combination of experiments, iterative product launch, and *validated learning*. Under the term *validated learning*, it is considered the process of discovering valuable facts.

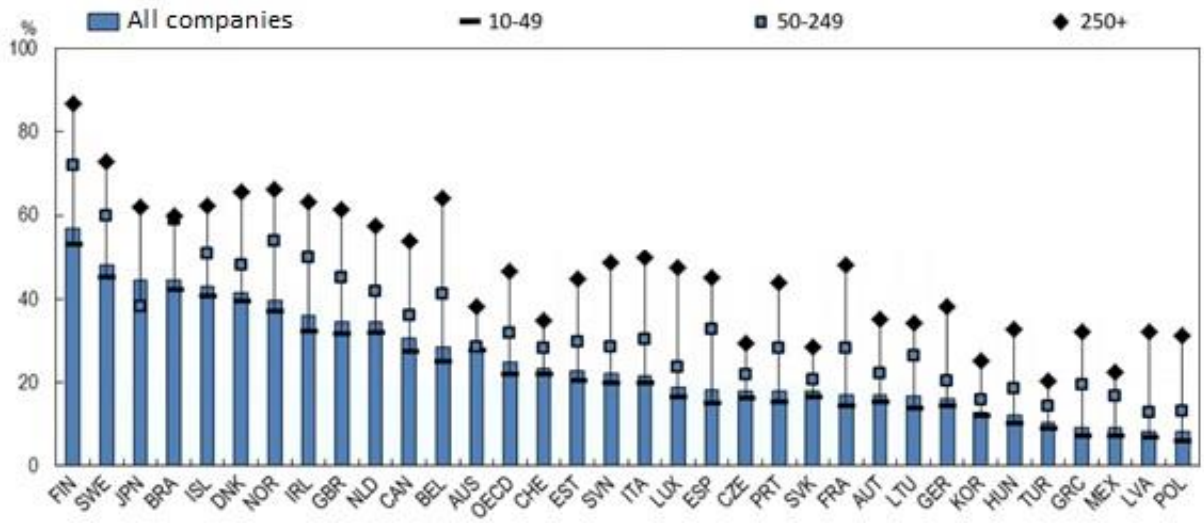

Figure 1 SMEs lag in the adoption of sophisticated digital technologies
Source: Authors' processing (OECD, Strengthening SMEs and entrepreneurship for productivity and inclusive growth - Key issues paper, 2018)

In terms of digitalization, the most important is the strategy of the SME itself. In relation to the strategy for the implementation of ICT, the digitalization of the company could be grouped into four groups (Miles & Snow, 2003) (Viscusi, 2015):

- *Digital Business Defender* (DBD, defender) is an organization that focuses on competitiveness in a narrow and well-defined (product-service)–market in digital business, mainly giving attention to efficiency and productivity, and improvement of existing operations.
- *The digital Business Prospector* (DBP) is an organization that focuses on the continuous differentiation and innovability of products and/or services and continuously seeks new opportunities of the digital market, primarily by giving attention to experimentation. These companies usually have a decentralized management structure.
- *Digital Business Analyzer* (DBA) is an organization that operates on two markets, on one stable and with a limited degree of digitalization, and in the second highly digitalized, developed and susceptible to frequent changes. In the first market, the organization functions as a defender, while on the other acts as a prospector. Because of their orientation, such business companies have a matrix organizational structure that on the one hand is oriented to budgetary financing of its stable activity, and on the other hand, their business is based on individual projects, i.e. on the development groups that are forming and financed by the current projects.[2]
- *Digital Business Reactor* (DBR) is an organization that is unable to respond efficiently to changes and uncertainty in the business environment, due to inadequately articulated strategy or organizational structure which is in an improper manner related to the strategy or still follows outdated strategies and structures.

Digitalization is, above all, sociological change, not technical. This can be seen from the fact that everything about it mostly contains "why?": Why do users use social networks? Why are they using mobile devices? Why does big data show trends? Why can companies buy and use consumer products? Why is it easier to manage systems in the cloud? (Baxter-Reynolds, 2014)

[2] The person which use metal detector while searching for metal (gold) objects in the ground.

2 DIGITIZATION AS A MODERN PROCESS OF PERFORMANCE IMPROVEMENT

The wave of digitalization developed at the end of the Second Decade of the twenty-first century, some call the third or fourth industrial revolution or "Second Machine Age" (Brynjolfsson & McAfee, 2011) (Valenduc & Vendramin, 2017). To emphasize the effect of digitalization Autio (2017) called it a digital disruption. The simplest example of one such digital disruption could be the appearance of the Uber. It was a digital disruption that disturbed taxi companies. Those days practice was a phone call to a taxi carrier's central office and booking a taxi through the operator, or, simply, stopping the taxi by waving a hand. Uber has enabled users to know the price of the drive before entering the vehicle. The payment is done at the end of ride on the pre-selected way, which can be: credit card payment, Google pay, Apple pay, cash, or, only in India, using "Airtel Mobile wallet" (MDT, 2012) or "Unified Payments Interface (UPI)" (Swarajya Staff, 2017). What the cab drivers' answer could be? The protests and trials were one of the possibilities. The other, creating alternative applications and adapting to new conditions. And both the answers came up. In some countries, taxi drivers organized protests and pressured on authorities to ban this service, and/or a lot of trials were initiated. In some other, taxi business companies adapted and let into the use of their own applications to better communicate with users. The second alternative is considerably more favorable for the users of taxi services and will certainly win despite administrative obstacles.

A similar digital disruption occurred when Netflix appeared. For a relatively small amount of money, subscribers may select the video content that interests them. Instead of getting movies from TV companies and cable operators and watching them on their TV with plenty of commercials, the user can get them on their computer and then reroute them to the TV where they can watch them without advertisements. This disruption greatly affects the monopoly status and the income of the TV companies, because with reducing the number of users the importance of advertising is also reduced together with the prices per individual advertisement. This is multiple negative for the operations of TV companies. The only real response to this disruption may be to adapt the radio-diffusion companies with a new situation and offering content in a new way that would include also a video on demand and web delivery of content, and new benefits for subscribers.

Digitalization has already made significant changes in relation to the engagement of the workforce and the necessary knowledge and skills that workers should possess in employment and during employment engagement. Automation introduced robots and even "artificial intelligence" into production processes which provided a more balanced production, and higher quality of products and production with higher series and increased productivity, safety, and other positive indicators. But, in parallel with these positive effects, the gap between employment and productivity appeared. The number of jobs is decreasing, and productivity is growing (Brynjolfsson & McAfee, 2011, p. 188).

In the industry, the issues of employment and the workers ' status are more clearly defined, but digitalization also here achieves a significant impact. According to the IndustriAll (2015) "digitalization is massively affecting employment and has specific effects" that are reflected in:

- Endangering the number of jobs intended for people. It is estimated that around 40% of jobs in the entire economy will be replaced with digital technologies.
- The concentration of power and wealth in digital electronic business platforms. This jeopardizes other participants in the chain of values, as they reduce the opportunities for investing and ensuring favorable working conditions and salaries to their employees.
- Jeopardizing basic employment settings. Full-time continuous employment can become rare because many tasks can be performed from a remote location or automated. Competition is created at the world level in work prices and the quality of employees.
- Creating conditions for asymmetric, vertical and unilateral control of workers, but also for horizontal, multilateral cooperation among workers. Which form will prevail will depend on political will, not on technology.
- One of the important features of digitalization is "transparency". Analysis of this trend requires a lot of time and carries with it many

issues that within this study will not be thoroughly reviewed, but it is visible emergence of "digital discrimination" in certain areas. Digital discrimination itself is not explored enough yet, but as an example, it can serve a study published by Edelman and Luca (2014). The study is related to Airbnb and demonstrated that when "a new data set combining pictures of all New York City landlords on Airbnb with their rental prices and information about characteristics and quality of their properties" was used, "non-black hosts are able to charge approximately 12% more than black hosts, holding the location, rental characteristics, and quality constant ... These results highlight the risk of discrimination in online marketplaces, suggesting an important unintended consequence of a seemingly-routine mechanism for building trust." (Edelman & Luca, 2014). A similar analysis was done by Pope and Sydnor (2008) for the new market P2P lending. Their analysis showed that those who placed the black man picture will have 25-35% less chance of getting a loan than those who placed a picture of the white man, although they have a similar credit profile. The deeper analysis of Pope and Sydnor concluded that P2P the market of lending is treating the race more equal than expected and reducing the chances of obtaining loans are more influenced by other factors, but the fact that the odds are less it stays.

Digitalization also brings new challenges. Although it is already in full swing, many unanswered questions are still attached to it. There are still unclear relationships between workers and employers, men and platforms. Also, questions about monopoly and competition, future development, whether or where and how to pay taxes need answers. Digitalization and globalization have resulted in issues of global significance. Given the nature of digital goods and services, it is already noticeable that it is difficult to monitor the real influence of digitalization on changes in the economy and society.

3 NEW DIGITAL ECONOMY – SHARING ECONOMY

By analyzing digitalization, a new phenomenon can be observed, the so-called "sharing economy". Under the sharing, it is commonly implied "a form of social exchange, which takes place among people who know each other and that goes without any profit" (Eckhardt & Bardhi, 2015). However, when sharing is market-oriented, it is difficult to align it with the previous sharing definition. This is about an economic exchange in which participants expect some benefit.

In the economy of sharing, it is understood that companies and users have less desire to possess something, and more often what they have or what they need, they share with others, whether it is real estate, business premises, production resources or other material goods. This is a brand-new business model brought by the Internet and digitalization. As examples can serve time-sharing, bicycle-sharing, Airbnb, Uber, Car:Go, Taxify (Bolt), etc. However, as part of the sharing economy, issues related to the working force appear. The economy of sharing includes also independent performers, temporary workers, self-employed, half-time workers, free workers, and ' free agents ', so it is to expect in the United States by 2020, over 40% working forces to have uncertain employment. Up to 2025 most working forces will have uncertain employment. (Reich, 2015). The decline of demand or sudden change of consumer needs, or injury or disease, can make impossible to pay the bills. "It eliminates labor protections such as the minimum wage, worker safety, family and medical leave, and overtime." (Reich, 2015)

In the narrowest sense, sharing can be considered as a "peer to peer" (P2P) model of communication and doing business, but in the case of appearance of platforms as a mediator in communication and realization of sharing, especially in cases that include payment of goods/services, it may be classified in B2C or C2B (or, more precisely in B2B2C or C2B2B) business models, depending on what stage is the sharing process at.

The economy of sharing is a very broad area, and for ease of parsing, Edgar Szoc (2015) has proposed three criteria:

- A criterion of the monetization of goods and services offered,
- A criterion of investment, i.e. the needs of investments in physical capital, and
- Location criterion, i.e. the possibility of relocation of the service.

The first criterion can distinguish cases such as Wikipedia or "Couchsurfing" where the sharing of information or the couch is completely free (although Wikipedia lives from user donations) and platforms such as Uber, eBay, or Airbnb that charge their services to service providers. In both cases, the types of services that are provided are very similar. This criterion allows segregating the actual collaborative economies in which the objective of the participant is not to achieve profits. However, it is needed, but it is not enough, because free services are provided also by Google, Facebook, and Twitter, but their owners expect dividends.

The second criterion provides a distinction according to whether capital is required to provide the service, as in the case of Uber or Airbnb, or it is only enough to offer own workforce as in TaskRabbit or “Rent a Friend” cases. Even in the second case, when the services of their own workforce are offered, it is not necessary to deal with poorly paid jobs. Platforms that are specialized for providing services of highly educated experts also appear here.

The third criterion enables differentiation between services that are related to a specific geo-location (the location of the apartment, cars, ships) and services that can be made through the Internet and independently from the purchaser and the perpetrator locations (accounting operations, Intellectual services...). It specifies the possibility of creating an alternative, parallel labor market, which with the application of appropriate platforms enables long-distance employment and gives many advantages to employers and major competition for potential employees, especially in highly developed countries. As an example, it can serve the website upwork.com with its motto: "Hire freelancers. Make things happen." (Upwork, n.d.) This website does not see itself as an employer, but an "online workplace for the World", a platform for top business companies for engagement and work with the world's most talented independent experts (Degryse, 2016). Competition is global and differences between the countries where the service bidders live disappear. Practically, one can talk about virtual migrations of highly skilled workers. There is a similar situation with the Amazon Mechanical Turk (MTurk) platform that works in the labor market that requires human intelligence. The MTurk Web service allows companies to access this market and engage diverse "on request" labor force. Developers can use this service to incorporate human intelligence directly into their applications. The Amazon called this model "Artificial artificial intelligence". Basically, it's about outsourcing. The idea is that some tasks instead of computers are performed by ordinary users, and the Amazon as a platform takes its percentage. (Amazon, 2018)

Although digitalization has brought new employment opportunities, it should be necessary to keep in mind that such employment is not regulated by any form of contract that would protect the rights of workers. The worker is left to fend for himself in the market. This way of hiring, although in every way problematic from the legal aspect is spreading at high velocity and will have a growing impact on the labor market throughout the world.

In connection with the general digitalization and appearance of the mass collection and storage of all the data, known as "Big Data", there appeared a need for a summarizing of that data by the extraction of small amounts of precious, condensed, data. Although it is generally widely thought that these procedures are fully automated, it is far from the truth and most experts for processing large amounts of data deal with tasks of the acceptable data interpretation. They work in groups, and their tasks are divided into very small and simple continuously repeatable tasks. This would suit modern, digital, Taylorism. Further sharing of jobs on new subgroups and even smaller jobs can lead to further reductions in the employment needs of skilled personnel, which will bring workers to a more disadvantaged position.

In the aforementioned "Mechanical Turk" (Mturk) a multitude of workers work on jobs that are not yet possible to automate, but under conditions that are very unfavorable for workers. "As contractors, AMT workers are excluded from the protections of minimum-wage laws. Amazon also allows employers to decide whether or not they want to pay. The intention is to let employers set standards. The effect is that unscrupulous AMT users steal wages. (Irani, 2015). " To protect the ‘Turkers’ Irani and Silberman, they started the website turkopticon.ucsd.edu with the possibility to download an Internet browser add-on that could obtain information about the prior experience of

Turkers who worked for the employer who offers the job on AMT. This site has served as an inspiration for the initiation of other forms of protection, such as in Germany, through the Green Book (Nahles, 2015), and then through the White Book (Nahles, 2017)

The examples of sharing economy are more detailed explained in (Martucci, 2018), but some examples of the sharing economy will be reviewed here with comments and explanations of the authors:

- **P2P borrowing**; P2P Loans existed before the computer appeared, but by the appearance of Internet communication, they got a new form. In recent days, platforms have emerged that individuals can borrow each other's money without common banking procedures. The platform in these cases determines the interest on the basis of the credit history of borrows. This way of borrowing is risky for the one who gives the money but is becoming more popular because of the more liberal standards for approving loans. Application of blockchain technology and the appearance of many of the startups in this area can affect the severity of the whole process. It is undoubtedly that the expansion of this way of borrowing will affect the banks to reconsider their credit approval policy.
- **Group financing**; Similarly, as P2P borrowing, group financing links those who need money with those who have it and want to invest it. On platforms such as *Kickstarter* or *Indiegogo* entrepreneurs, artists and others can present their ideas and projects to potential financiers, to define their financial needs and the deadline they plan to collect the money they need. In this way, entrepreneurs and other SMEs can dramatically reduce costs and obtain an outstanding tool for fundraising. Some of the platforms keep the money until the deadline is set, and then submit it to the borrow recipient if the campaign is successfully completed or return to lenders if the campaign was unsuccessful. The campaign is successful if the whole defined amount is collected (or more) by the set period. Like in P2P borrowing, there is a possibility that the borrow recipient has no intention of returning the loan. As an alternative to lending, there is a grant. In this case, the money is collected in the same way, but the loan-recipient is not expected to return the "loan". In order to encourage lenders to fund grants, borrow recipients sometimes offer something in return, but very often the lenders meet only emotional pleasure that they participated in a useful project.
- **Renting of apartments and houses and *couch surfing***; Platforms such as Airbnb, VRBO, and Couchsurfing connect property owners with people who need lodging during the trip. Owners of apartments and houses when they are not in their facilities are given the possibility to offer them, at the prices they specify, to others to use by informing them of available dates. Travelers choose what is best suited to their needs based on the offer. Before handing over the property to use, the user and the owner can sign a contract on the terms of use of the object, and usually, the user leaves a deposit as a measure of protection of the owner in case of property damage. It is also possible for the user to evaluate the owner and the object, and that the owner of the object evaluates the user upon the expiration of the rent. This can be useful for later renting on the same platform. One of the risks for this type of business can be interference by a state under pressure from the hotel industry and fear that it will not collect taxes from such services.
- **Ridesharing and car-sharing**; If one can say that the state doesn't look favorably on renting apartments and houses, car-sharing and the ride-sharing situation can be even worse, primarily due to the impact of taxis associations. Car- and ridesharing are about the need of a user to use the car in situations where their personal car is not available, or when they do not want to use it, or when they do not possess it at all. For such situations, taxi services can be used, but given the prices of taxi services and the current needs and capabilities of the taxi service users, it does not have to be an acceptable solution. In ridesharing, using the Uber or Lyft applications, the user can mark its position and target travel point, and one of the closest drivers with its private vehicle will satisfy user needs. Using the applications Car2Go and/or Zipcar user can locate the nearest free vehicle, provided by a profit or non-profit

organization, take the vehicle, drive it by itself to the target point and leave it in some parking lot, not thinking about it further, and user pays only for the time spent in the vehicle. With the GetAround application, the user can rent one or more of the vehicles of private persons and pay the use of vehicles per hour or day, with the condition that the vehicle will return to the owner in the agreed term. Car-sharing is like the services provided by the classic car rental company, except renting is done in a much more flexible way. The model is applicable also when SME or a large company is the owner of vehicles, but to participate the SMEs need the support of the state and the creation of proper legislative regulation.

- **Coworking**; Coworking existed before the computer, but the appearance of IT-enabled that in one place, in the same space, freelancers and entrepreneurs work in a comfortable environment along with other professionals. Many cities and universities have created such environments where they have provided fully equipped workplaces for more users, and users pay rent on a weekly or monthly basis depending on how much space they use and how much time they spend. In addition to the advantages of this kind of work, entrepreneurs and freelancers get the ability to communicate with similar ones working in other areas, which provides them better inclusion in society and the economy.
- Special purpose services; Internet platforms enable SMEs to offer special, specific, services intended for a particular group of users. For example, the Spinlister platform enables bicycle rental; the DogVacay platform allows dog owners to find dog-lovers who will hold their pets while they are absent for travel. In this way, a dog lover who protects someone's pet will have the opportunity to earn something. In similar ways, SMEs can create their own platforms to participate in many sharing activities including wardrobe, sports equipment, and many other different things.

From the above, the benefits of sharing economy can be crystallized as:

- Cheaper goods and services,
- Supplementary income for service providers,
- New opportunities,
- Better socialization and connectivity.

On the other hand, identified risks are:

- The potential loss of privacy,
- Lack of warranty, or lack of enough warranties,
- Loss of control over ownership due to cooperation with others,
- Market disorders.

If the risks are considered more detailed, it can be seen that due to the increase of the short-term renting of flats (due to potential higher earnings) the rental market in the long term remains deprived of a large number of housing units, making it difficult to find an appropriate apartment. At the same time, it affects rent prices. An entrepreneur who works in a common space with others can count on getting the new useful information, but also that the part of its own information will be given to others, which would not be the case if he had his own space.

For now, it is possible to say that the sharing economy has perspective and that it is still in the experimental phase.

4 IS EVERYTHING IN TECHNOLOGY?

At the time of the latest industrial revolution, anyone with a "smart" mobile phone can create an application or offer services and thus contribute to own budget. If it can do individuals, then also the SMEs can do the same. Therefore, a justified question appeared: Is everything in technology?

While the adoption of ICT and digital technologies is accelerating, the facts say that there is still a significant "digital divide" between small and large companies. (EC, 2011) To raise the level of adoption of digital technologies in SMEs, it is necessary to identify the challenges for their adoption in order to choose the paths of digitalization in accordance with the actual needs. Most SMEs cannot afford to employ digital experts and therefore the e-business and digital strategies of SMEs mainly depend on interest, understanding and digital skills of entrepreneurs and owners/managers. (Hynes, 2016, p. 3)

The challenges of adopting digital technologies in SMEs resonate with internal and external influences, and it is important to identify whether the owners/managers and/or staff have

appropriate knowledge and interests or are lacking digital skills. In connection with the application of digital technology, often occurs a lack of interoperability between different ICT systems used for data exchange, distribution and exchange of information, and marketing. These systems are predominantly developed for big companies, and the discrepancy of such systems with the needs of SMEs may become the reason for the repulsion by the owners/managers. In addition, SMEs owners and managers are generally aware that investing in the latest digital technologies does not automatically mean better results of the business. To achieve this, they need to understand what these technologies can do and for what purpose they are designed. (Hynes, 2016)

Practically all innovations, immediately after the idea is shaped, move into the field of dependency of technology. Whatever is invented, is realized by the application of technologies or disappears as non-competitive. E. g, traffic in the cities is very often in the congestion zone. The idea was to replace the ownership of the vehicle with the possibility of using joint vehicles as needed by renting "an hour". In this way, according to the OECD report (2017), nine out of ten vehicles appear as unnecessary (Berge, 2018). However, the realization of the idea, immediately in the first step requires the use of digital technologies to answer the question of the nearest free vehicle. The next, about the right of the user to use the free vehicle, the payment of service and similar, it is necessary to apply ICT.

So, if one needs to answer the question, "Is everything in technology?" it could be said that it's not all about technology, but without the technology, it is hard to survive.

5 CONCLUSIONS

Digitalization has caused a digital disruption in society and major changes in all aspects of the business. Different societies reacted differently from complete (unjustified) negation to very quick adoption.

There is a big difference in access to digitalization in SMEs and large companies. While large companies are massively using software applications to manage business process flows, this is not the case with SMEs. There is also a big gap in cloud computing. SMEs are lagging in adopting digital technologies due to a lack of investment in knowledge-based assets. In addition, SMEs are more exposed to the challenges in digital security and privacy.

The impact of digitalization is best reflected in the structure of created new jobs and in the structure of disappeared jobs and companies.

As a result of digitalization, a new phenomenon has emerged, a sharing economy that implies that businesses and users increasingly express the desire to satisfy their resource needs by sharing them with others. In this way, resources are used more rationally. This has transposed also to the workforce and to the tendency that employers increasingly employ workers for some period or part-time. This undoubtedly affects job security.

The benefits of the sharing economy are cheaper goods and services, additional revenue for service providers, new opportunities, and better socialization and connectivity. On the other hand, identified risks are the potential loss of privacy, the absence of job guarantees, or the lack of enough job guarantees, the loss of control over ownership due to co-operation with others, and market disruptions.

It can be said with certainty that the challenges of adopting digital technologies correlate with internal and external influences. As the main internal influence, it appears the interest of the managers/owners for new technologies and their ability to accept and use these new technologies, i.e., their possession of knowledge and skills in the field of IT application. The main external influence is the influence of a state. The state by various stimulus measures can support the process of digitalization in SMEs.

Finally, it is inevitable that most SMEs will have to either digitalize or disappear.

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Received for publication: 24.10.2019
Revision received: 17.12.2019
Accepted for publication: 10.01.2020

How to cite this article?

Style – **APA** *Sixth Edition:*

Bogavac, M., Prigoda, L., & Cekerevac, Z. (2020, January 15). SMEs digitalization and the sharing economy. (Z. Cekerevac, Ed.) *MEST Journal, 8*(1), 36-47. doi:10.12709/mest.08.08.01.05

Style – **Chicago** *Sixteenth Edition:*

Bogavac, Milanka, Lyudmila Prigoda, and Zoran Cekerevac. 2020. "SMEs digitalization and the sharing economy." Edited by Zoran Cekerevac. *MEST Journal* (MESTE) 8 (1): 36-47. doi:10.12709/mest.08.08.01.05.

Style – **GOST** *Name Sort:*

Bogavac Milanka, Prigoda Lyudmila and Cekerevac Zoran SMEs digitalization and the sharing economy [Journal] // MEST Journal / ed. Cekerevac Zoran. - Belgrade – Toronto : MESTE, January 15, 2020. - 1 : Vol. 8. - pp. 36-47.

Style – **Harvard** *Anglia:*

Bogavac, M., Prigoda, L. & Cekerevac, Z., 2020. SMEs digitalization and the sharing economy. *MEST Journal,* 15 January, 8(1), pp. 36-47.

Style – **ISO 690** *Numerical Reference:*

SMEs digitalization and the sharing economy. **Bogavac, Milanka, Prigoda, Lyudmila and Cekerevac, Zoran.** [ed.] Zoran Cekerevac. 1, Belgrade – Toronto : MESTE, January 15, 2020, MEST Journal, Vol. 8, pp. 36-47.

MEST Journal
DOI 10.12709/mest.08.08.01.06

HOW TO GET MANAGEMENT SKILL IN THE COURSE OF INFORMATICS?

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JEL Category: **I21, M15, O32**

Abstract

The article introduces the content and methods of informatics education respecting a focus on management. Students of the communication and information systems branch are future officers of the Czech Armed Forces. Their main mission will be managing and working with people. This fact and the development of the so-called soft skills in management are taken into consideration in the teaching of informatics-related topics. Gradually, the article deals with individual topics of the course: management, organization and analysis of information sources, knowledge management systems and project management. The use of pedagogical methods is particularly emphasized by independent student work, the development of their creativity and innovativeness. In the literature review, there was not found any similar document with the theme of the paper. In the analyzed articles were discussed the various forms of leadership development and was emphasized the importance of ICT for innovativeness. The management part in the course is focused on management functions, management cycle OODA, and cycle PDCA of processes improving. The organization of the information sources and analysis of the text document is based on the explanation of the information systems development procedure and using Tovek Tools. The part of the course in knowledge management systems and project management is an opportunity for students to work independently in developing their own knowledge system and project planning.

Keywords: *management, education, informatics, ICT, CIS, university, students, CAF.*

1 INTRODUCTION

The article informs about the teaching of ICT (information and communication technology) military specialists at the University of Defense (UoD), Faculty of Military Technology; Department of Informatics, Cyber Security, and Robotics. A fundamental change took place in 2014 when moving from a two-level study (Bachelor and Master) to a continuous five-year engineering study. The UoD changed their study programs on a request from the Ministry of Defense (MoD) and General Staff of the Czech Armed Forces (CAF). The study plans were successfully accredited within the faculty. A new study program was an opportunity to innovate the content of the teaching courses.

This paper introduces the course of the Communication and Information Systems (CIS) Management which is being taught in the fifth year of study. During the course, we try to develop a specific skill in team cooperation, decision-making

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based on obtaining the necessary information, leadership, autonomy, creativity, innovativeness, etc. The mission of future officers, CIS specialists, after they graduate from the university, will be management, leadership, and cooperation with people. Few of the students can imagine it; they usually assume that somewhere in the CIS workplace they will perform expert assignments of communications, informatics, or security.

The basic prerequisite for the management of CIS people is, of course, as well as in other fields of expertise, a high-quality CIS expert base. It is complicated to prepare university students for their future role as commander. Students, although passing a course of management in general subjects, are certainly not adequately prepared.

That is the reason why the course CIS Management was included in the program of specialization to further develop the students in the field of management, considering their professional orientation. We build on the functions of the management cycle from which the parts of the subject matter are developed, such as organizing and analyzing information resources to support the decision-making process and working with knowledge.

2 THE LITERATURE REVIEW

The literature review about management in information technology or ICT and on soft skill development was based on articles indexed at Web of Knowledge and Scopus. The articles analyzed various contexts in the search topic, but no match was made directly to the article's focus. In relation to teaching, ICT is presented in particular with its implementation in teaching courses, integration into other subjects, and the focus of individual ICT disciplines on teachers and students. Regarding soft skill development were available papers with explaining the term, its importance, classifications, and ways to its development. The next topic in the literature was analyzed soft skills in connection to project management.

In an article (Drent & Meelissen, 2008), the factors that stimulate or limit the innovative use of ICT by teacher educators in the Netherlands were mentioned. Creative use of ICT is defined as the use of ICT applications that support the educational objectives based on the needs of the current knowledge society. Explorative path analysis and case studies were used to study the potential influencing factors. Results show that several factors at the teacher level influence the implementation of innovative ICT-use in education. Teachers who are so-called 'personal entrepreneurs' are particularly important for the integration of ICT in teacher education.

The paper (Webb, 2005) presents an analysis of how affordances of ICT-rich environments identified from a recent review of the research literature can support students in learning science in schools within a proposed framework for pedagogical practice in science education. Furthermore, other pedagogical and curriculum innovations in science education are examined to see how they may be supported by ICT. It identified support learning through four main effects: promoting cognitive acceleration; enabling a wider range of experience so that students can relate science to their own and other real-world experiences; increasing students' self-management; and facilitating data collection and presentation.

The nature of soft skill is explained in the paper (Levasseur, 2013), includes self-awareness, communication, collaboration, and leadership. In the information systems branch are mentioned: interaction with users and clients, work cooperatively in a project team, understand the business environment, be self-directed and proactive, and be able to analyze IS solutions to business problems. In project management discipline, contain oral and written communication, a strong work ethic, teamwork, initiative, and well interpersonal behavior. The environments for developing soft skills in practice include self-study, training, mentoring, and couching.

The article (Vinichenko, Ridho, Kirillov, Makuchkin, & Melnichuk, 2017) discusses the development of leadership skills in the talent management system. The methods of research were questionnaire surveys, content analysis, and mathematical data processing. The study of the respondents' opinion on the nature of leadership development in the talent management system allowed establishing some parity between soft skills and hard skills. Almost half of the respondents consider the development of soft

skills to be important for increasing the competitiveness of the organization.

Participating students apply in the education principles of learning to their own practice as they learn to incorporate theories and reflect on their impact on their projects, within their own contexts. They report this to be an effective approach as it reinforces their learning and highlights practical outcomes. The success of this approach is attributed to integrating principles from a wide range of interdependent disciplines including action learning, leadership, project management, reflective practice, sense-making, stakeholder engagement, problem-based learning and knowledge management. Reflecting on the impacts of soft skills in their own projects enhances learning outcomes and develops their professional capabilities. (Shelley, 2015)

3 MANAGEMENT

The first part of the course education is the topic of management. Students need to be told that this is a very broad concept. Managing means having subordinates under one's leadership to control, manage, and regulate. It is about how to lead, manage, manage things; control, induce others to adopt domination, agree to decision by motivation, action, and manipulation to achieve the desired goal. Significantly, we understand management as a designation of a profession, a group of workers, a field of study, or a scientific discipline.

Management is a systematic and coordinated process leading to a predetermined goal. It is supposed to bring some results with the best possible use of the human, material and financial resources that the organization (and hence the manager) has at its disposal. The aim is above all to evaluate all inputs, and the resulting benefit depends on managerial and professional assumptions as well as the engagement of managers responsible for organizational management. The management process is composed of the functions: Planning, Organizing, Commanding, and Controlling.

In the military environment is mostly mentioned the OODA (Observe-Orient-Decide-Act) management cycle (Mulder). Each phase of the cycle can be supported by appropriate information processing technologies. The most important phase is orientation, which affects both the creation of the right alternatives for decision and the method of observation and that functions are supported by ICT, used in the course.

Getting practice skills in management can only be handled in practice. The student must be put in a role where management functions can be applied to subordinates or colleagues. This can be difficult during the study. A selected student performs the function of group commanders, but to command of classmates is quite difficult. Management can also be tested in the role of team leader in the classroom if teams are set up to solve a common task. Students at an internship in military troops can obtain the best experience in management before getting into practice.

The PDCA (Plan-Do-Check-Act) (Mulder) processes are applied as an iterative, four-stage approach for continually improving processes and for resolving problems (see Fig. 1). The students verify the PDCA cycle mainly for seminar, credit or final work:

- **Plan:** Identify and analyze the problem or opportunity, develop hypotheses about what the issues may be, and decide which one to test.
- **Do:** Test the potential solution, ideally on a small scale, and measure the results.
- **Check/Study:** Study the result, measure effectiveness, and decide whether the hypothesis is supported or not.
- **Act:** If the solution was successful, implement it.

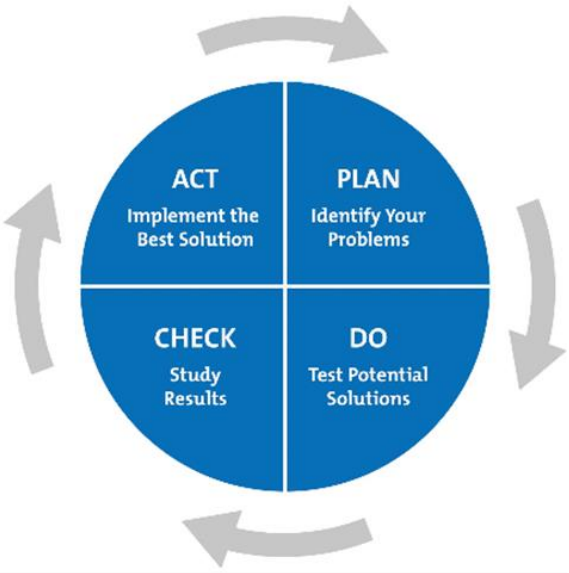

Fig. 1. PDCA cycle, Source: (Mind Tools, 2019)

4 ORGANIZATION OF INFORMATION SOURCES

The course includes parts of the information system (IS) and its structure:

- People in different roles (users, administrators, creators, managers).
- Data, information, and knowledge.
- ICT technical resources - (computers, communication systems, data storages …).
- Methods, procedures and ICT tools (languages, development environments …).
- Management of running and organizing work (guidelines, security, and ergonomics).

In the military environment, the ISs are divided into administrative and war fields. The fielding IS are labeled as Operational Tactical Command and Control Systems; in NATO they are known as C2IS (Command and Control IS) and their aim is to improve the overview on the battlefield (situational awareness), rationalize work, facilitate decision-making, link reconnaissance–command and weapon systems and achieve greater combat effectiveness.

The center of interest for future military specialists is the Army Staff System of the CAF, which is operated in a closed army domain and includes:

- Information Portal (news, free positions, phonebook, security questionnaire ...).
- Access to other IS MoD (financial, personnel, logistics ...).
- Other information sources (process model of the MoD, military crew, headquarters, Lessons Learned, central services, foreign military missions ...).
- E-mail to all military personnel, connected to the network.

From the point of view of CIS management, it is important to get acquainted with the process of creating the IS and its life cycle (LC) in the army environment, which includes 6 phases, and within them are created 25 documents in total.

Phase 1 "Design Concept"
1. Project intent.
2. Security plan.
3. Specifications.

Phase 2 "Development"
4. Tender documentation.
5. Contract.
6. Introductory study.
7. CIS development plan.
8. Security documentation.
9. Project documentation.

Phase 3 "Implementation"
10. Regulation for the testing process.
11. Protocol about the test run.
12. Regulation to initiate operational use.
13. Operational security documentation.
14. Operational security guidelines for classified NATO CIS.
15. Operating user documentation.
16. Protocol at the end of the project.
17. Protocol on the take-over of CIS for operational use.

Phase 4 "Operation and Use"
18. CIS operation plan.
19. Maintenance plan.
20. Records of disturbances and emergencies.
21. Subsystem management records.

Phase 5 "Support and Change"
22. Migration proposal.
23. Draft modification.

Phase 6 "Decommissioning"
24. Evaluation of CIS.
25. Protocol on the disqualification of CIS.

Students as a team prepare documents of the selected LC stage in the seminar work. They have all documentation on the IS LC. In addition, the Guidelines on the competencies of individual roles in the IS LC, are assigned to the teamwork.

5 ANALYSIS OF THE TEXT DOCUMENTS

The right decision depends on the situation analysis, including the analysis of information sources. Documentation systems, such as SW Tovek Tool (TT) (Tovek, 2019), the professional tool for analyzing the information sources and text mining, are designed for this purpose and are used in the course.

TT consists of five modules:
1. Index Manager (IM) for indexing data sources.
2. Tovek Agent (TA) for search in indexed data.
3. InfoRating (IR) for context analysis among the retrieved documents.
4. Query Editor (QE) to create complex queries.
5. Harvester (HA) for detail content analysis.

Information sources for analysis can be text documents, websites, databases, and e-mail. The information resources are first processed by the IM, which creates an index file. The search is then performed in the index file using the TA or QE module. The results of a simple search create a first result of what concepts (keywords) are contained in documents and can prepare their simple segmentation. It then enables the development of a broad analysis of search documents using more complex queries or the performance of contextual or content analysis using IR and HA.

This part of the course develops mainly autonomy and the ability to find solutions. The assignment is usually general; its purpose is to analyze a specified set of documents. In particular, students will design information analysis goals and strategies and then step by step to achieve the objectives of the analysis using all TT modules. Their progress and results are documented in the protocol; the results are presented in their defense at the seminar.

6 KNOWLEDGE MANAGEMENT SYSTEMS

In the theoretical part of the course, students are lectured the basic principles of working with knowledge, their classification, acquisition, and processing. Students learn that knowledge is:

- **Explicit**, which can be described verbally, expressed through a scheme, an image, or defined in another formal way. It is easily communicable.
- **Hidden (Tacit)**, which includes experience, skills, and intuition. They are often tied to their individual wearers who may not even know about it. It is not directly communicable.

Human knowledge is divided into procedural (how to do something), declarative (describing what we know), heuristic (problem-solving based on previous experience), structural (describes mental models and organization), inaccurate and uncertain (often inaccessible, incomplete, random, associated with probability), ontological (devoted to a domain) and others.

To develop practical applications, it is necessary to gain human knowledge (from experts or other sources), to understand it correctly, to record it in a formal representation, to verify it in a practical intelligent system and to develop it further. It is not easy to capture the knowledge engineer either in direct dialogue or by observing experts - direct and indirect techniques.

Direct:
- Discussion, questionnaire.
- Expert observation at work.
- Recording and query analysis

Indirect:
- Imagination - knowledge assumptions (knowledge assumptions).
- Expert recognizes old patterns in new issues far before others.
- Different forms of recording (text, tables, hierarchies, networks, flow charts).
- Grouping of knowledge and group processing (clustering, arrangement, and hierarchy).

Knowledge management is a process, social and technological system for preserving, developing, sharing and spreading knowledge. It is an approach to finding, understanding and using knowledge in an organization to create value, improving organizational performance, and achieving its goals. Knowledge management, rather than technology, focuses on methods and procedures.

In practical education, students create their own knowledge system, based on methodology, and verified in the departmental research. They use the ATOM system (aion, 2019), an application accessible on the Internet; its processing is fully outsourced by Company AION CS, Zlín. ATOM is a non-programming web database SW that does not require specialized knowledge; anyone can easily construct a knowledge system on it. The system contains the powerful full-text search engine and integrates information about objects in the knowledge base.

The complete ATOM solution includes three layers (environments):

1. **ATOM Studio:** Ontology Designer, user administration, batch data in/output module.
2. **Data Editor:** Includes data into the database via the ontology.
3. **User Portal:** Approach to the knowledge system.

The methodology of the knowledge management system (KMS) development includes some steps.

At first, it creates the ontology of the problem domain in the Ontology designer. Students suggest their own KMS and analyze a problem domain. The ontology design consists of two tasks:

- the schema of the classes and associations, defined in the SW Visual Understanding Environment (VUE) (see Fig. 2) and
- classes elaboration in the table form (see Tab. 1).

Then the ontology is prepared for implementation into the Ontology designer (see Fig. 3). The students' work example is "Using the software-defined radio (SDR) in the Cipher CAD environment". The form for including data about SDR is in Fig. 4; an example for SDR IZ255.

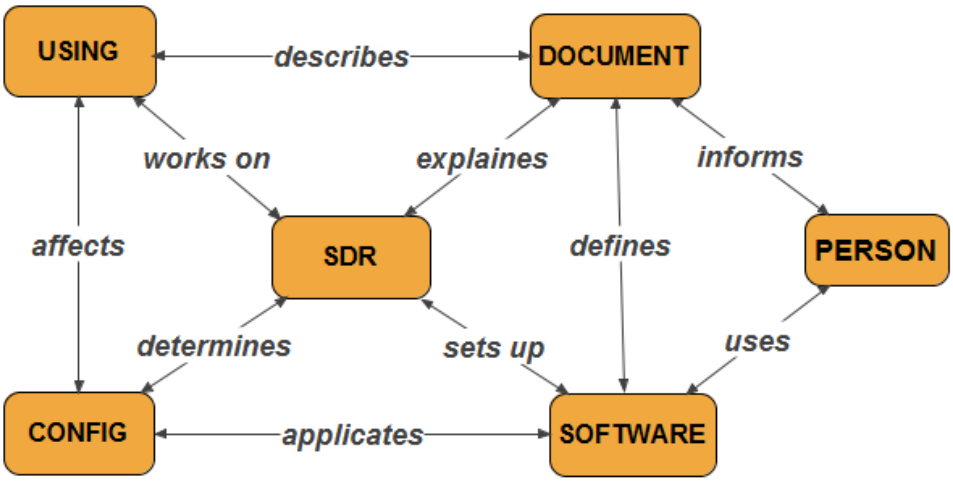

Fig. 2. Ontology design - a schema of classes and associations; Source: own (student work)

Tab. 1. Ontology design - classes and their characteristics; Source: own (student work)

Attribute	Data type	USING	CONFIG	SDR	PERSON	SOFTWARE	DOCUMENT
price	number					X	
sensitivity	number			X			
format	text						X
freq-band	text			X			
category	text	X					
name	text				X		
license	text					X	
options	text		X				
par-others	text			X			
num-pages	number						X
requirement	text					X	
professional	boolean	X					
source	URI						X
met-of-use	text		X				

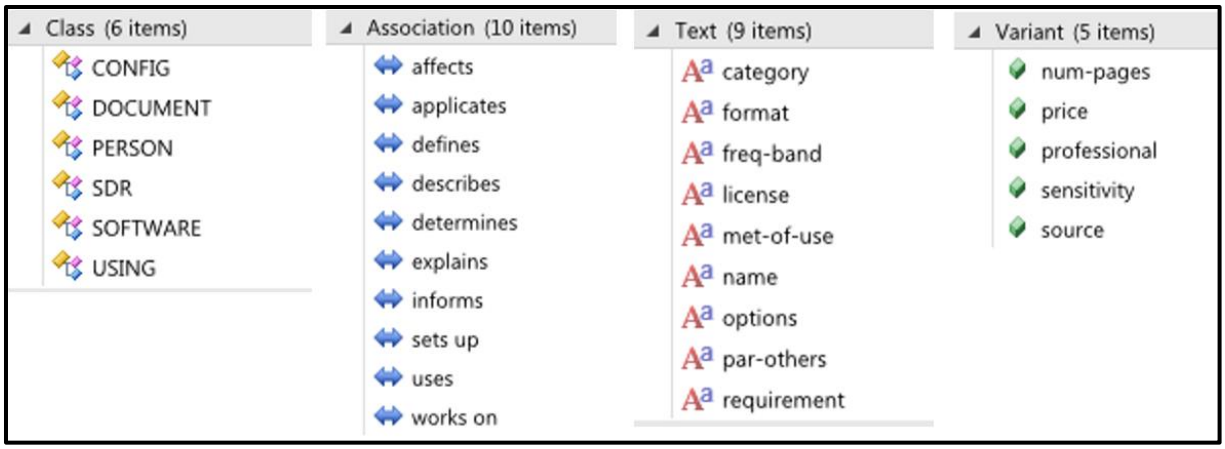

Fig. 3. Ontology implementation in Ontology designer; Source: own (student work)

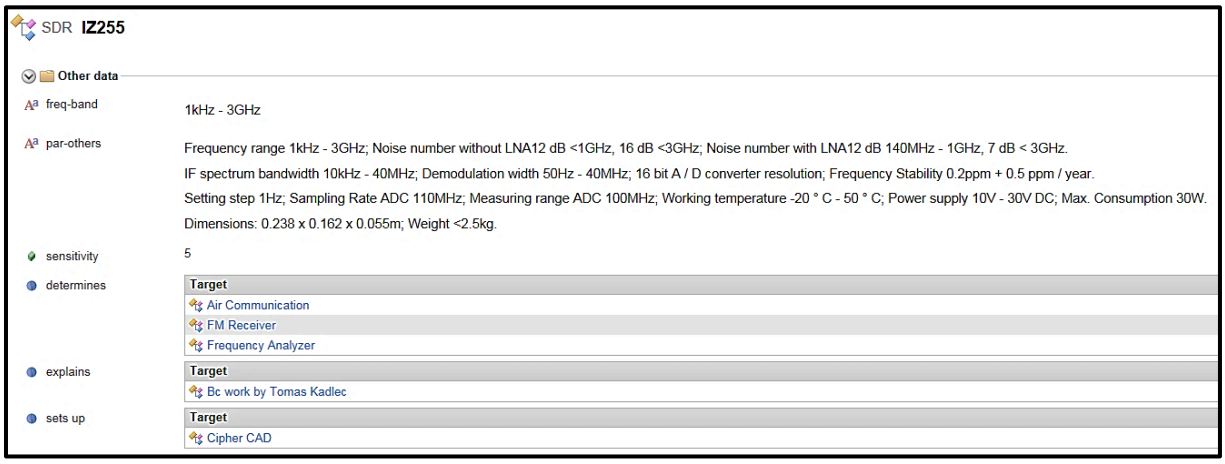

Fig. 4. KMS development – a form of the class SDR; Source: own (student work)

7 PROJECT MANAGEMENT

Students are acquainted with the basics of project management (PM) and prepare the project as a seminar work. The characteristics, the conditions of success and phases of the project are important in the theoretic part of the education.

Project characteristics:

- Time Boundary (Temporary, Start, End).
- Clearly defined goals (including the requirement for the quality of results).
- A working process aimed at achieving goals (achievement of change).
- Uniqueness, non-cyclic, breadth, complexity.
- Limited resources, uncertainty, risk.
- Unified efforts of experts of various branches (synergy of activities).

Project success conditions:

- The setting goals and priorities; all activities must be planned.
- Sufficient provision of resources (personnel, finance, technology, time).
- Strong support and interest of project owners.
- Involvement in the project of the involved and affected groups.
- Quality organizational framework.
- Manager's responsibility and authority.
- Designation of risks and measures for their elimination.
- Reliable team communication.

Project phases:

1. Preparatory, initialization.
2. Planning, design.
3. Implementation.
4. Evaluation, termination.

The project requirements are specified in the preparatory phase:

- They are unambiguous and relate to some of the project's parts.
- It is possible to trace and test them (the content of fulfillment).
- Create a good starting point for project analysis.
- They have the necessary details, are consistent (not in conflict).
- Are written in user language (understandable to users).

The planning of the project primarily means setting its goals and defining strategies to achieve them; creating a decomposition of project activities and developing plans (timing, cost, allocation of resources, a matrix of responsibilities) and optimizing them.

In addition, techniques and tools for PM and communication are chosen, restrictions and risks are identified, and a proposal to eliminate them is adopted.

Management of the project concerns the implementation of plans, the coordination of solution subjects, team communication, and conflict resolution. The analysis, correction, and evaluation of the project (time, costs, and resources) must be carried out while ensuring the quality of the project; the management of the opposition proceedings and the change management meetings, all with reliable technical and administrative support.

Students need to emphasize that project designing is a complex and risky activity that is often unsuccessful (up to 70%) in which managers have an irreplaceable role. If possible, organize practical lessons in teams. In it, students learn how to control MS Project and plan their own diploma work and the result is given in the form of a seminar paper.

8 CONCLUSION

The article deals with a partial theme of teaching and preparing the students of UoD, future military specialists in the field of CIS. It introduces the subject of CIS Management, whose mission is in the background of teaching informatics, developing knowledge and skills in management and working with people. The special ambition of the subject is to develop students' soft skills in such a way that their practical involvement in CAF functions is realized with minimal problems. Further research of the department, in relation to the objectives of the CIS Management course, will be focused on verifying how we manage to meet in the subject's defined goals.

The contribution of the article, in the field of expertise, is the specification of the course of informatics and management, the teaching of the students at the UoD, future CAF officers. The taught disciplines suitably support management and decision-making skills, in accordance with the management cycle steps. In the field of pedagogy, there are described in each discipline the methods of how to develop the practical skills of the manager by developing a suitable soft-skill for leadership.

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Received for publication: 12.12.2019
Revision received: 23.12.2019
Accepted for publication: 10.01.2020

How to cite this article?

Style – **APA** *Sixth Edition:*

Burita, L. (2020, January 15). How to get management skill in the course of informatics? (Z. Cekerevac, Ed.) *MEST Journal, 8*(1), 48-56. doi:10.12709/mest.08.08.01.06

Style – **Chicago** *Sixteenth Edition:*

Burita, Ladislav. 2020. "How to get management skill in the course of informatics?" Edited by Zoran Cekerevac. *MEST Journal* (MESTE) 8 (1): 48-56. doi:10.12709/mest.08.08.01.06.

Style – **GOST** *Name Sort:*

Burita Ladislav How to get management skill in the course of informatics? [Journal] // MEST Journal / ed. Cekerevac Zoran. - Belgrade – Toronto : MESTE, January 15, 2020. - 1 : Vol. 8. - pp. 48-56.

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Style – **ISO 690** *Numerical Reference:*

How to get management skill in the course of informatics? **Burita, Ladislav.** [ed.] Zoran Cekerevac. 1, Belgrade – Toronto : MESTE, January 15, 2020, MEST Journal, Vol. 8, pp. 48-56.

MEST Journal
DOI 10.12709/mest.08.08.01.07

CRIME INDEX AS ONE OF THE MAIN INDICATORS OF SAFETY

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JEL Category: **C88, L86**

Abstract

The evolution of crime and its constant changes bring with it several new types of crime, which have many different crimes. By collecting and analyzing data in the form of these offenses, crime statistics are often generated for different periods of time or territorial units. The aim of these statistics is to divide the territory into smaller territorial units in which the level of crime is mutually assessed. For this purpose, a crime index has been created and is currently used to determine the level of crime in a territory. As crime is constantly developing and globalizing, it is necessary to modify this index to optimize and apply it in the European Union. Recently, security research has focused on crime index research. In the currently solved projects at the University of Zilina, creating a set of security indexes is one of the important challenges.

Keywords: *safety, crime, the crime index*

1 INTRODUCTION

Safety has always been an important factor in human existence. Humans try to protect their health, life, property and integrate into society in order to achieve a certain social status, on the basis of which he will respect and share one common space with him. Otherwise, certain social and legal norms and rules may be breached, which is the main essence of the crime.

Thus, crime is one of the key indicators of the security level of a certain area. Its status can be expressed by the crime index, which can be considered as an objective indicator of the state of crime.

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2 CRIME AS A SOCIAL-PATHOLOGICAL PHENOMENON

Crime can be described as a negative social phenomenon that has legal, criminological, forensic, sociological, psychological and other aspects. It adversely affects the harmonious development of society. Spiritual and material damages to individuals or social groups are the result of violations of applicable laws, standards, moral values of society as the basis of crime (Gaspierik, 2010).

By examining the different attitudes and views of the notion of crime, we can simply divide crime into two groups:

a) criminality understood as a crime,
b) criminality understood as behavior or conduct which, although not sanctioned but socially undesirable (Gasperik, 2010).

The state of crime can be described as an indicator of the safety of the local environment, which indicates a deterioration of the security situation in a specific location (Hofreiter, 2016).

2.1 Crime structure

Since crime concentrates many different anti-social behaviors, individual actions, it would not be right to label it as a monolithic one. Therefore, the following aspects are considered when assessing the structure of crime:

- type of crime,
- demographic aspect,
- urban aspect,
- territorial aspect (Hofreiter, 2004).

One of the main aspects of assessing the structure of crime is the **type of crime**. The aspect of crime type consists of specific types of crime (Molovcakova, 2018).

In the Slovak Republic, police statistics most often indicate the distribution of crime, which consists of:

- violent crime,
- moral crime,
- crime against property,
- economic crime.

As society evolves, crime also evolves, bringing with it several new types of crime, such as drug-related crime and cybercrime (Hofreiter, 2004).

Given these divisions, the type of crime will be characterized by the species listed in the following table (Table 1), which presents the state of crime in the Slovak Republic for the year 2018.

Table 1 State of crime in the Slovak Republic for the year 2018.

Type of crime	Registered crimes	Cleared up crimes	Clear-up rate [%]
Violent crime	5 781	4 413	76
Moral crime	1 122	735	66
Crime against property	21 787	9 545	44
Other crime	7 099	5 609	79
Economic crime	13 515	6 784	50
Remaining crime	12 088	10 115	84
Total crime	**61 392**	**37 201**	**61**

Another aspect of crime structure assessment is the **demographic aspect**. The essence of this aspect is the application of different aspects such as:

- sex,
- age,
- the social or economic status of the offender, etc.

These aspects are used for statistical processing of crime and for the detection of the share of individual groups of offenders (Table 2) in committing crimes (e.g. minors, juveniles, persons intoxicated with alcohol or under the influence of drugs, etc.) (Hofreiter, 2016)

Table 2 Individual groups of offenders in the Slovak Republic

Type of crime	Registered crimes	Contributing factors			
		Alcohol	***Drug***	***Minor offender***	***Juvenile offender***
Violent crime	5 781	1 729	21	84	297
Moral crime	1 122	54	-	51	270
Crime against property	21 787	948	15	458	1 357
Other crime	7 099	661	57	44	232
Economic crime	13 515	4 729	63	9	80
Remaining crime	12 088	51	3	48	113
Total crime	**61 392**	**8 172**	**159**	**694**	**2 349**

The **urban aspect** of crime assessment makes it possible to analyze the proportion of inhabitants of urban areas (towns, municipalities) in total crime and in individual types. Applying this aspect of crime assessment, we conclude that cities are riskier in terms of crime than smaller rural settlements (Hofreiter, 2016).

The accession of the Slovak Republic to the European Union and the need to adapt to the methodology of the countries of this community was a standardized classification of territorial units for statistical purposes - NUTS (Nomenclature of territorial units for statistics) (Table 3). This system is a five-level hierarchical classification in which the NUTS I - NUTS III levels refer to the regional level (territory, area, region) and the LAU I (NUTS IV) - LAU II (NUTS V) levels refer to the local level (district, municipality) (Kmet, 2019).

Table 3 Standardized classification of territorial units in the Slovak Republic

Level				
Regional			***Local***	
NUTS I	NUTS II	NUTS III	LAU I (NUTS 4)	LAU II (NUTS 5)
Country	*Region*	*District*	*County - number*	*Municipalities – number*
Slovak Republic	Bratislava	Bratislava	8	73
	West Slovakia	Trnava	7	251
		Trencin	9	276
		Nitra	7	354
	Central Slovakia	Zilina	11	315
		Banska Bystrica	13	516
	East Slovakia	Presov	13	666
		Kosice	11	440

Finally, it is necessary to mention the territorial aspect, which makes it possible to analyze the distribution of crime in a certain territory with a certain population by region (Hofreiter, 2004).

Specifically in relation to this aspect that we can come across a tool that compares crime in individual regions or locations - crime index,

which is common, used worldwide (Cekerevac, 2018).modification of crime index

The crime index is a quantitative indicator of crime, which expresses the ratio of the number of registered crimes (RC) to the population of the surveyed location (R) calculated per N residents (N = 1,000, 10,000 or 100,000). Most often, a crime index is created, indicating the number of crimes detected per 100,000 residents (less than 1,000 and 10,000).

$$CI = \frac{RC}{R}\ x\ N$$

CI – crime index,

RC – registered crimes,

R – residents of the surveyed location,

N – residents (1 000, 10 000 or 100 000.

In the Slovak Republic the statistics of the Ministry of the Interior, which are accessible to its residents, show absolute, not relative values what we can see in figure 1.

This results in distortion or deviation from the actual, real state of the crime level.

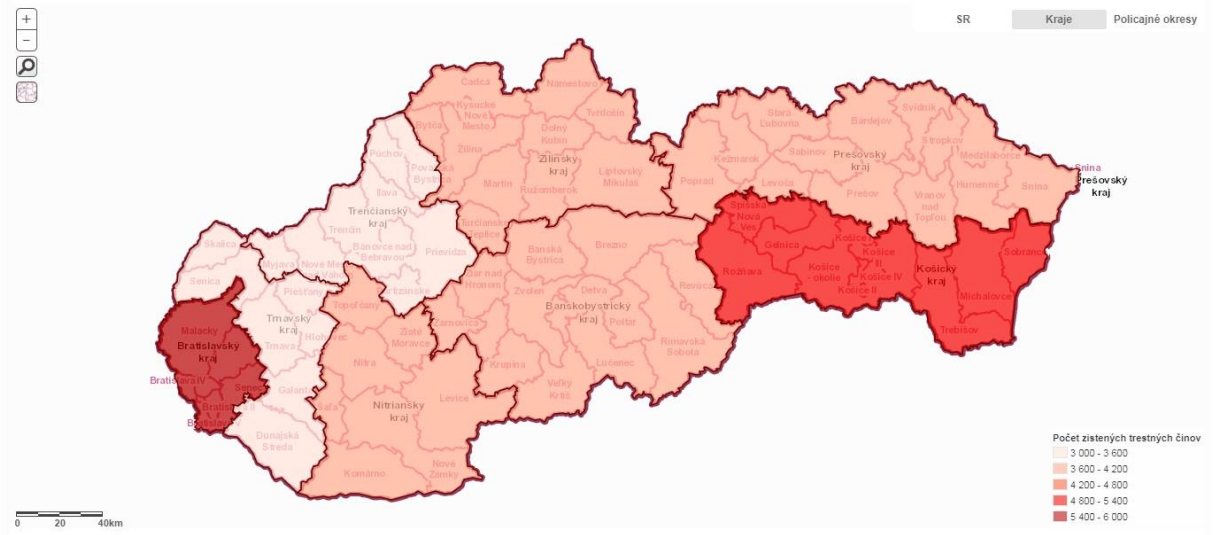

Figure 1 Number of detected crimes in the Slovak Republic in 2018 (Crime map, 2019)

When comparing absolute and relative values of crime (crime index) it is possible to see a change in the order of individual regions in Table 4.

Table 4 Order of individual regions of the Slovak Republic by crime

District	Number of registered crimes	Criminality A*	Cleared up crimes	Clear-up rate [%]	Residents	Crime index	Criminality B**
Bratislava	10 973	***1***	5 163	47	659 598	*166*	***1***
Trnava	6 396	***7***	3 840	60	563 591	*113*	***3***
Trencin	5 514	***8***	3 415	62	585 882	*94*	***7***
Nitra	7 380	***3***	4 374	59	676 672	*109*	***5***
Zilina	7 048	***6***	4 744	67	691 368	*102*	***6***
Banska Bystrica	7 169	***4***	4 743	66	647 874	*111*	***4***
Poprad	7 138	***5***	4 883	68	825 022	*87*	***8***
Kosice	9 543	***2***	5 875	62	800 414	*119*	***2***

* Criminality A - Order of districts in the Slovak Republic by registered crimes
** Criminality B - Order of districts in the Slovak Republic by the crime index

Currently, we can observe differences in the crime indexes of individual European Union countries. As the Slovak Republic is a part of it, our effort and task will be to modify and optimize the crime index within the Slovak Republic with possible use in the other EU Member States (Soltes, 2018).

Scales of individual crimes

It is necessary to determine the scales of individual crimes first. A growing number of new crimes arise with a growing society. Some have a lesser impact on society or the individual and some have a greater impact. Therefore, when assessing crimes, account should be taken of:

- consequences:
  - no bodily harm,
  - minor bodily harm,
  - serious bodily harm,
  - death,
- number of the concerned person,
- the amount of damage.

The values of these three indicators should form the basis for determining the weight of the crime.

Criminally liable residents

The crime index includes residents of the area where the crime occurs. It is very important that only residents who are criminally responsible are counted in this index.

Residents without permanent residence

The crime index should include all residents of the area under consideration, including residents without permanent residence of that area. This is mainly because these people can also be involved in creating crime. Above all, these are larger cities in which there is a massive turnover of either the incoming employees of local companies or tourists.

Assessed area

At present, the main deficiency of the crime index is the area under review. Police districts or regions are too large areas to create security measures to reduce crime. The same is true from the perspective of the resident who is trying to find out the level of crime in his place of residence. One example is the high level of crime in the Žilina Region in 2018.

For example, a citizen living in Rajec falling under the Zilina region with a high crime rate in 2018, even though no crime was recorded in that city this year. This may mislead or misrepresent citizens' views of safety or the level of crime.

Number of N residents

Individual EU countries recalculate the crime index per 1 000, 10 000 or 100 000 residents. It is important to establish a uniform value for the potential confrontation of individual EU countries.

Determination of critical thresholds

The crime index represents the determination of the crime level of the selected territory. This index should include a critical threshold indicating a site with a high crime level, where security measures must be taken as a matter of priority to bring the crime level below the critical threshold.

3 EXPLOITATION OF CRIME INDEX IN PRACTICE

Part of the initial version of the crime map project of the selected region is also the crime index.

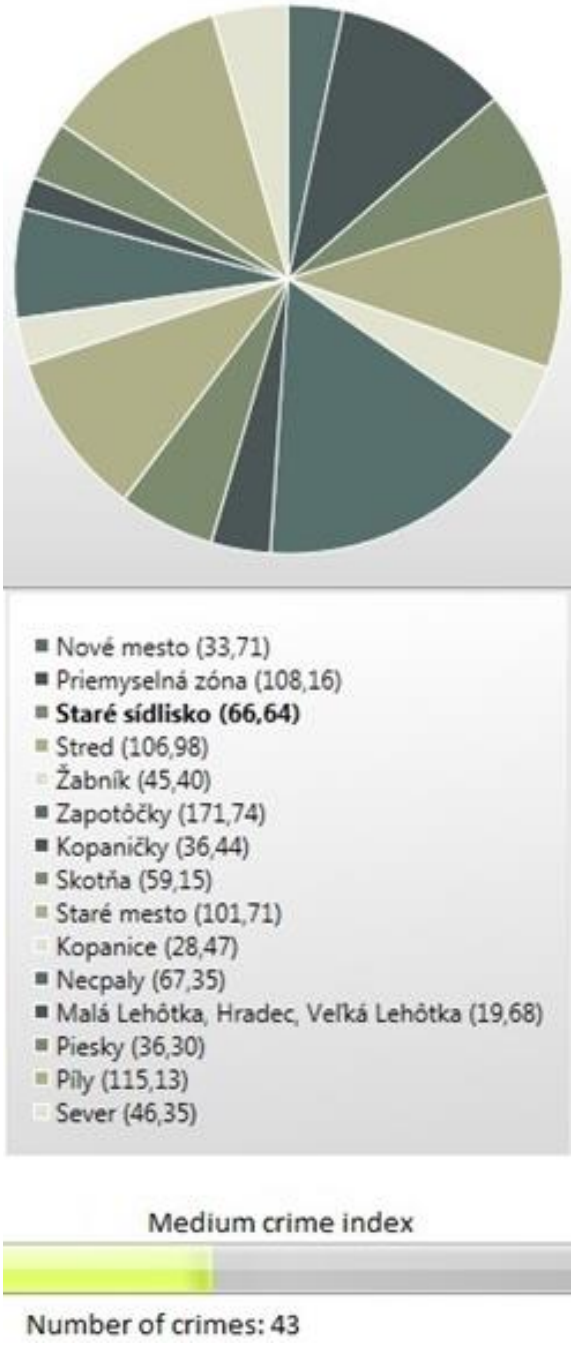

Figure 2 Crime index for 2018

Its display is represented by a pie chart in the application along with a list of individual locations of the selected region (Figure 2). After a resident has selected a specific location using a filter, he must choose a time period for which he will see the crime index, either year or year and month.

Subsequently, all sites of the selected region with the corresponding crime index will be displayed in this section. If a resident moves the mouse over each part of the pie chart, he will also see the crime index of that location (Kmet, 2018).

The crime index indicator subsection shows the level of crime, which can be rated as *low*, *low to medium, medium to high* or *high*, based on the value of the crime index (Figure 2). Each level of crime is assigned a different color. The resident can use this indicator to find out the level of crime in the selected location and compare it with the level of crime in other locations for a certain period (Kmet, 2018).

This part also includes the number of crimes of the selected location.

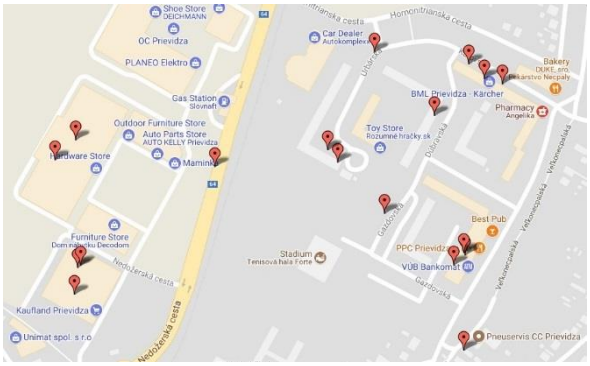

Figure 3 Display of crimes of the selected location on the map

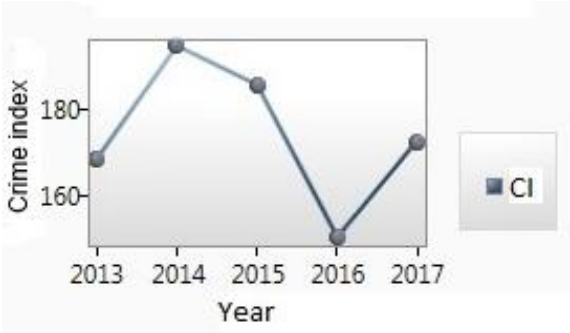

Figure 4 Evolution of the crime index in the selected region

Through the crime index, we can follow the evolution of crime levels over time (Figure 4). The evolution of the crime index may be focused on the year or month of each location of the selected region. This is an indication for the resident of how crime levels have developed over the past few years in specific locations in the selected region. Using this indicator, we can determine whether the level of crime in each location tends to increase or decrease. We can also identify months in which the level of crime is increased.

The result of modifying the crime index is the optimization and greater objectification of the crime status analysis of the selected region. This allows us to identify locations as priorities in designing, creating and applying measures to reduce crime levels or predict crime levels for the future.

4 DISCUSSION OF RESULTS

The crime index is important for theoretical research and is also very important for practice. In practical use in the Slovak Republic, the Police of the Slovak Republic presents only absolute numbers of crimes by district and region. If the total number of crimes is recalculated to the number of inhabitants of the locality examined, it is not possible to make a ratio comparison. For a citizen, the relative state of crime is more interesting than the absolute number of crimes.

On the theoretical level, it is possible to create different ratios. Currently, researchers have focused on modifying the crime index. We perceive the scales of individual crimes as key. Their definition must be based on real research and be as objective as possible.
Researchers found these weights:

- extensive questionnaire investigations,
- personal consultations with experts on crime issues,
- brainstorming in crime workshops,
- obtaining relevant information from abroad,
- working with researchers at home and abroad.

Effective communication with the Police of the Slovak Republic and obtaining real information is a serious problem in objectifying the scales of individual crimes of the Crime Index. Currently used police information systems cannot be used in real research. The only way is to collect selected data from the police information system through personal consultations. In the future, it would be appropriate to create a superstructure of the police information system, which will export the anonymized data and thus be available for research.

5 CONCLUSION

Crime analysis is part of every major city in Europe. It can result in crime statistics that show a certain level of crime in a given territory. These areas are most often police districts or higher territorial units (regions). The shortcoming of this statistic can be identified just the territory, which is too large to create concrete measures to increase security or reduce crime. Another drawback can be the resulting statistics data, which show the number of crimes of a certain territory without these crimes converted to population. This brings with it misleading, distorted information provided to residents.

That is why our focus has led to the crime index, which is currently the only objective indicator of crime levels that are used across European countries. If we look at the states of the European Union, the values that are part of the crime index vary. In order to optimize and make it more objective, this index needs to be set up so that it is uniform for all EU countries so that the state of the crime of these states can be compared. The modified crime index should include the creation of scales for individual crimes, less space to be assessed, the inclusion of only criminally responsible residents as well as residents who do not reside in the surveyed area and, finally, the determination of threshold values.

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Acknowledgment

This paper was supported by institutional grant project UNIZA - Information system for evaluating the level of crime of a selected region

Received for publication:	13.09.2019
Revision received:	28.12.2019
Accepted for publication:	10.01.2020

How to cite this article?

Style – **APA** *Sixth Edition:*

Kmet, R., & Dvorak, Z. (2020, January 15). Crime index as one of the main indicators of safety. (Z. Cekerevac, Ed.) *MEST Journal, 8*(1), 57-64. doi:10.12709/mest.08.08.01.07

Style – **Chicago** *Sixteenth Edition:*

Kmet, Roman, and Zdenek Dvorak. 2020. "Crime index as one of the main indicators of safety." Edited by Zoran Cekerevac. *MEST Journal* (MESTE) 8 (1): 57-64. doi:10.12709/mest.08.08.01.07.

Style – **GOST** *Name Sort:*

Kmet Roman and Dvorak Zdenek Crime index as one of the main indicators of safety [Journal] // MEST Journal / ed. Cekerevac Zoran. - Belgrade – Toronto : MESTE, January 15, 2020. - 1 : Vol. 8. - pp. 57-64.

Style – **Harvard** *Anglia:*

Kmet, R. & Dvorak, Z., 2020. Crime index as one of the main indicators of safety. *MEST Journal,* 15 January, 8(1), pp. 57-64.

Style – **ISO 690** *Numerical Reference:*

Crime index as one of the main indicators of safety. **Kmet, Roman and Dvorak, Zdenek.** [ed.] Zoran Cekerevac. 1, Belgrade – Toronto : MESTE, January 15, 2020, MEST Journal, Vol. 8, pp. 57-64.

MEST Journal
DOI 10.12709/mest.08.08.01.08

FINANCIAL LITERACY OF THE MANAGEMENT STUDENTS AND DURABILITY OF THEIR KNOWLEDGE

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JEL Category: **A20, A22, A23**

Abstract

This paper deals with the issue of financial literacy of university students. The research focuses on students in managerial fields of study for whom financial literacy is an important part of their professional profile. The analysis of financial education at universities is conducted in terms of the efficiency of this process and the durability of the acquired skills. In particular, the aim was to verify the durability of knowledge gained during financial education. The level of financial literacy of students was verified by the method of the questionnaire survey which took place in two cycles. The first round has run immediately after completing the financial course and it was repeated in the second round after a half-year time interval when the education was interrupted. The authors analyze the impact of the forgetting process by the statistical comparison of the research samples they obtained in these repeated surveys. In addition to professional questions, some self-reflective characteristics of respondents were obtained. These data have enabled analyze the causes of rapid forgetting or, conversely, maintaining or increasing knowledge. Through the self-reflective assessments of the respondents, it became clear that the importance they attach to financial literacy is a decisive factor in maintaining the competences acquired.

Keywords: *education in management, financial literacy, statistics*

1 INTRODUCTION

New technologies help us in different areas of life, but our lives become increasingly complex. Much more knowledge of financial and investment decision-making is needed than our parents needed. It is difficult to make informed decisions on new financial products and digital financial services that bring new types of risks. Financial markets offer many new products that are difficult to understand. The digital environment has simplified access to new products that are increasingly attracting small investors. We simply live in conditions heavily marked by globalization that have little resemblance to those of 30 - 40 years ago. As individuals, we have greater responsibility for saving, investing and accumulating pension funds. The population of the

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EU countries increasingly bears the burden of financial security for pensions and, in particular, the possible consequences of their own financial decisions in managing their assets. Household over-indebtedness is a common phenomenon in all European countries. That is why the phrase “to achieve financial stability” from the mouth of young and old generations is often repeated today.

One of the key factors in maintaining financial stability in a person's professional and personal life is a sufficient level of his/her financial literacy. After all, most of our decisions have a financial context. The decisions that affect us the most and determine the ability to achieve financial stability we make only a few times in our lifetime. These are decisions on long-term investments (such as retirement plans), debts (selecting the most appropriate way of financing housing), their structure and volume, which would take into account real household income. More frequently we decide, for example, whether to move to better job opportunities or not and also the possibilities of exploiting life and property insurance. People make these decisions at a young age when they have little life experience and lack quality - contemporary and applicable today - knowledge and skills from financial literacy.

The advancement of technology and the impact of robotics require constant updating of knowledge and competences to a certain level of quality, not only for young people. Financial literacy and financial education are therefore still a problem. Financial literacy is not isolated literacy; is related to a range of soft skills and other literacy. The aim of financial literacy that is taught in schools is to help young people understand financial matters because it is the young generation who are in contact with increasingly complex financial products and services. As we observe progress in information technology and increasingly complex financial products, we can realize that young people are more likely to bear greater financial risk than their parents.

The education system and universities face an important challenge: to improve the financial literacy of the younger generation through financial education in the upcoming smart society. In a smart company, it is very easy to manage complex and sophisticated financial instruments, both investment and credit. It is possible to get a loan easily and very quickly with one mouse-click, but it is no longer so easy to repay. It is easy to get an investment, but it is difficult to bear the risks associated with it. Therefore, financial literacy will become a necessity for life and survival in a smart society. This is such a “SMART” that carries a new framework for everyday life and especially for the financial decision-making of everyone, as well as the management of the company, to be prepared for.

The aim of our research was to verify the level of financial literacy of university students, the effectiveness of financial education in terms of its impact on the level of financial literacy and the persistency of these competencies. In the current paper, we present an analysis of the durability of acquired knowledge and competences. We analyze the impact of some elements of self-reflection on the retention and eventual improvement of acquired skills or their decline. The results of this analysis then enable us to state certain principles on the content and course of financial education.

2 LITERATURE SURVEY

The European Commission defines financial literacy as "the capability of consumers and small business owners to understand retail financial products with a view to making informed financial decisions” (Habschick, Seidl, & Evers, 2007). OECD has defined financial literacy in a wider sense and more generally “is a combination of understanding, knowledge, skills, attitudes and behavioral patterns necessary to make the right financial decisions and, ultimately, to achieve personal financial well-being" (OECD & INFE, 2011). Our research is based on the definition of a financially literate person, how it was published in (Kozubikova, 2015) "It is a person who uses his ability to make a qualified judgment on the basis of the knowledge, skills and experience gained thus enabling him to smooth financial security throughout life." A financially literate person prefers to plan financial flows, which leads to more uniformly consumption throughout life, depending on the life cycle.

Interesting results were brought by the study of the authors (Nicolini, Cude, & Chatteriee, 2013). The purpose was to understand whether factors linked to financial literacy in one country could be

generalized to other countries or whether, due to the unique national characteristics, it was necessary to examine financial literacy in each country individually. The results indicate significant differences between countries, suggesting that there are national and cultural differences in what households know and need to know about their personal finances.

Here are many studies suggesting low financial literacy among young and low-educated people. The contribution of research (Agarwalla, Barua, Jacob, & Varma, 2015) is represented by the results that reflect the behavior of specific demographic and socio-economic groups and subsequent research of their investment behavior, accountability, risk-taking, and insurance use. It has been confirmed that financial literacy is closely related to the socio-demographic characteristics and financial burden of the family. How stated in (Lusardi, Mitchel, & Curto, 2010) “Financial literacy was strongly related to sociodemographic characteristics and family financial sophistication“. A strong positive relationship between financial literacy and household wealth is reported in (van Rooij, Lusardi, & Alessie, 2012), which confirms that money management skills contribute positively to the net wealth of the household. Moreover, the results of this study have shown that financial knowledge increases the likelihood of investing in the stock market, allowing individuals to benefit from the equity premium. It further proved, financial literacy is positively related to retirement planning and the development of a savings plan has been shown to boost wealth.

There is scope for young people to learn and acquire financial decision-making skills at all levels of the education system. We see evidence that verifies the close relationship between financial education and financial literacy. How to introduce (Lusardi & Mitchell, Financial Literacy and Retirement Preparedness: Evidence and Implications for Financial Education, 2007) “Around the world, financial education has become an important tool to tackle the growing complexity of financial decisions, especially in the life of the last generation.” Part of the research is solely aimed at university and college students. In recent years, they have introduced programs to increase student financial literacy in order to improve their students' quality of life and thus reduce their failure to repay student loans, see for example (Boyland & Warren, 2013). In order to identify the actual state of financial literacy of students and subsequently targeted financial education to address the shortcomings, the students' basic knowledge of income, money management, savings, expenses, and loans is analyzed. It is examined how much of the students is financial literate also in relation to risk tolerance and investment preferences.

The authors (Kozubik, Kozubikova, & Rybicka, 2017) also take into account the previous education at the secondary schools of respondents in financial literacy and the way of verifying skills. This survey also includes the respondent's self-assessment of the state of their financial literacy, the importance they attach to financial literacy and how they proceed when making important financial decisions.

The overall picture of financial literacy would not be complete without examining socially disadvantaged groups of the population, where financial literacy can explain a significant part of property inequality. (French & McKillop, 2016). The links between financial education and financial literacy are also confirmed by studies (Fernandes, Lynch, & Netemeyer, 2014) or (Lusardi, Yakoboski, & Oggero, 2017). These studies also confirm that financial literacy can be improved by high-quality financial education, which applies to all levels of the education system.

3 METHODS AND DATA COLLECTING

We obtained the research sample by the method of the questionnaire survey. Questionnaires were distributed among students three times. In the first phase, we examined the financial literacy of a wider group of university students in Slovakia and the Czech Republic. We have continuously published the results and analysis of this survey (Kozubikova, 2016), (Kozubik, Kozubikova, & Rybicka, 2017) and (Kozubik, Kozubikova, & Polak, 2019). For the second and third phases of the survey, we selected a narrower group of 200 management students. This choice was motivated in particular by the fact that we can rightly assume that financial literacy is going to be an organic part of their professional skills. The second phase of data collection took place immediately after the

end of the course, which included elements of financial literacy. At this stage, we verified the effectiveness of financial education and we published the results in (Kozubikova, 2017). The purpose of the third phase was to verify the durability of the acquired skills and competences. This third repeat survey was therefore carried out with a six-month shift after completing the course.

The questionnaire itself consisted of two parts. In the first part, we examined some personality characteristics and questions about respondents' self-reflection. The second part focused on the level of financial literacy. The problems were presented as multiple-choice questions with four response options. Only one of the options was correct, two options were incorrect and one of the options was the "I don't know" answer. The general concept of financial literacy we have structured in four disjoint areas:

- Time value of the money and inflation perception.
- Annuities and debt repayment.
- Investments and risk.
- Financial decision making.

We then assessed the financial literacy of individual respondents according to the percentage success of their answers.

To compare the results of individual surveys we used standard statistical methods. Specifically, to compare the average percentages in each round, we applied the Student's t-test for the hypothesis that the mean values of both samples are equal. As the variances were different in each set, we used the Welch modification of the t-test.

Since in some cases the tests did not allow us to reject the hypothesis of equality of mean values at the required level of reliability, we used empirical cumulative distribution functions and we compared the distributions by the stochastic dominance rules. The notion of stochastic dominance defines a partial ordering between the random variables. For our purposes, we applied the first order and second-order stochastic dominance rules.

Let X and Y are two random variables with the cumulative distribution functions $F_X(x)$, and $F_Y(x)$ respectively. We say that X dominates Y (in the sense of the first-order stochastic dominance) if $F_X(x) \leq F_Y(x)$ for all x, where a strict inequality holds for at least one x. Expressed by the language of probabilities it means that $P[X \geq x] \geq P[Y \geq x]$ for all x and the strict inequality $P[X \geq x] > P[Y \geq x]$ holds for at least one x. So, expressed by words, the random variable X tends to reach higher values than random variable Y.

Stochastic dominance of the second order is also defined in terms of cumulative distribution functions. Instead of a direct probabilistic interpretation of the cumulative distribution function, the functions $F_X(x)$ and $F_Y(x)$ are required to fulfill the inequality

$$\int_{-\infty}^{x} |F_Y(t) - F_X(t)| \mathrm{d}t \geq 0,$$

for all x, with strict inequality at some x. The integral in the inequality can be interpreted as the cumulative area bounded by the graphs of the distribution functions where the areas have opposite signs depending on which of the cumulative distribution function approaches greater values. The random variable X dominates Y if the area always remains non-negative.

4 RESULTS

Overall, we have distributed 200 questionnaires among the students in each of the two rounds. The questionnaires have been distributed twice because our aim was to verify that financial literacy skills have a descending tendency when education is interrupted. The first round had run immediately after finishing the course and the second round with the half-year delay from enclosing the course. After sorting the questionnaires and removing the questionnaires with malicious or incomplete responses, we obtained a sample of 162 questionnaires. This means that the response rate was 81%.

Before we proceed to analyze the influence of the time delay factor on the level of financial literacy, we briefly evaluate the changes in the importance of perceiving and in self-reflection. The results are presented graphically on the pie charts in figures 1 and 2.

From Figure 1 it is easy to see that immediately after completing the course, no respondent considered financial literacy to be of little importance or even unnecessary. However, if we look at the results at a half-year interval, we see that the proportion of those respondents who perceive financial literacy as very important, or

even vital, has remained with a positive shift to the vital classification. On the other hand, in the group that attributes financial literacy, groups of those who consider it less important or even unnecessary have separated.

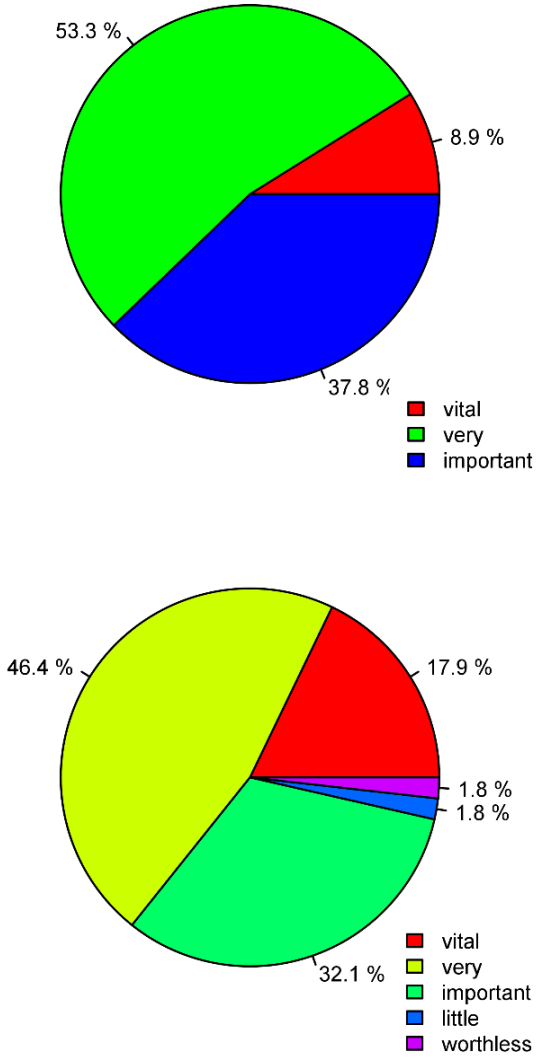

Fig. 1 The percentages of respondents by their importance perception of financial literacy. In the upper pie chart shares immediately after absolving the course, in the lower pie chart shares with the half-year delay. (Own elaboration)

Similarly, some structural changes can be observed in the area of self-assessment. As we can see in the graphs in Figure 2, immediately after completing the course, respondents were more self-critical. After some time delay, they are becoming less aware of their shortcomings. We can see that the share of those who feel fully financial literate has increased by about three times from 2.2% to 7.1%. In addition, the proportion of students who rated themselves as poorly literate was reduced to less than half from 4.4% to 1.8%. In addition, almost one-half assesses their skills as above average. How we will see from the results, such self-confidence is unjustified.

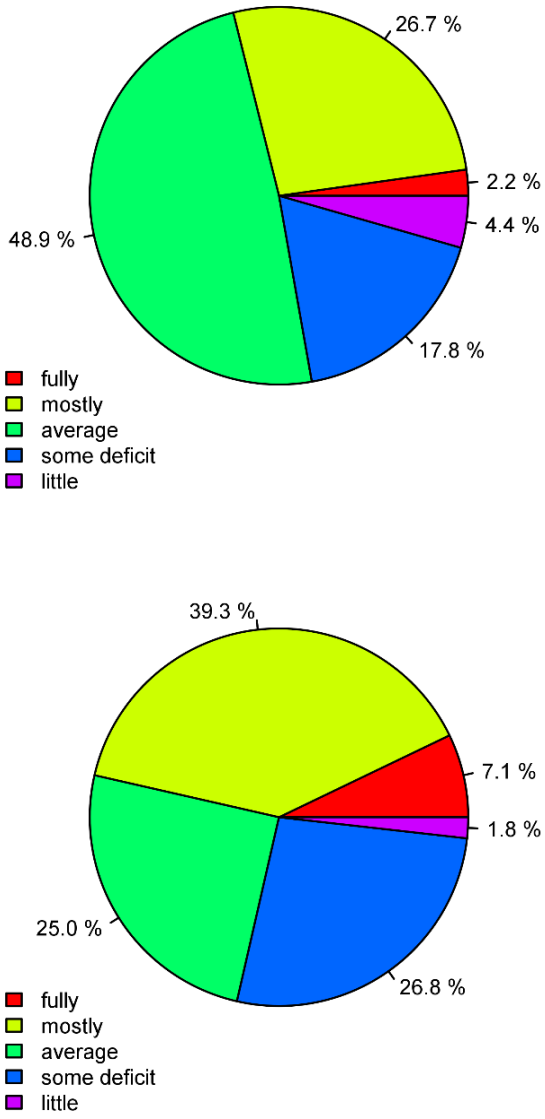

Fig. 2 The percentages of the respondents according to their self-appraisal of their own financial literacy. The upper graph immediately after finishing the course, lower with the half-year delay. (Own elaboration)

As mentioned above, we measured the level of financial literacy as a percentage of correct answers in the test. Table 1 shows the basic

numerical characteristics of the samples obtained in each round of testing. To compare the shift in knowledge, we also summarize in Table 2 the selected quantiles of these samples. From the values in Table 1, it is clear that the results immediately after the end of the course show a negative skewness and the resulting success percentages accumulate in above-average values. This is also confirmed by the lower level quantiles in Table 2. However, there is also an increase in the value of higher-level quantiles as well as a maximum success percentage. We will reveal the cause of this shift later in analyzing the results according to perceiving the importance of financial literacy.

Table 1. Essential sample characteristics of the percentages of the correctly answered questions immediately after completing the course and with a half-year delay. Source: Own elaboration.

When measured	Immediately	Half-year delay
Minimum	30.7%	7.69%
Median	53.85%	46.15%
Mean	50.94%	18.04%
St. deviation	10.3%	18.04%
Variation c.	0.202	0.388

Table 2. Selected quantiles of the percentages of correctly answered questions in both samples. Source: own elaboration.

Quantile	When measured	
	Immediately	With delay
Min	30.70	7.69
10%	38.46	23.07
25%	46.15	30.76
50%	50.94	46.15
75%	61.53	61.53
90%	61.53	69.23
Max.	76.92	84.62

As shown in Table 1, there is a difference of more than 4% between the average percentages immediately after the course and after the half-year delay. Using the Welch t-test, we can verify if we can reject the hypothesis of equality of mean values of both samples. We summarize the results of the test in Table 3. While the test against a two-sided alternative does not allow the hypothesis to be rejected at a sufficient level of confidence, in a test against a one-sided alternative that immediately after completing the average percentage is higher than half a year apart, we can reject the hypothesis with confidence exceeding 92%.

Table 3 Results of the Welch t-test of the equality of average percentages immediately after the course and after half a year after the course. Source: Own elaboration.

Alternative	Two side		One side	
Measured	Anon	Later	Anon	Later
Mean	50.94 %	46.84%	50.94 %	46.84%
t-statistics	1.435		1.435	
p-value	0.1547		0.07737	

The test result can also be confirmed by comparing both distributions. We illustrate the empirical densities and cumulative distribution functions in Figure 3. From the comparison of the densities in the left part of Figure 3, it is evident that immediately after completing the course, the percentages are more concentrated near the mode of the distribution. Thus, this distribution has higher kurtosis, negatively skewed and, in addition, the mode is significantly shifted to the right as opposed to the distribution of percentages after a half-year interval. The right part then compares the empirical distribution functions. It is evident from the figure that the distribution function graphs intersect, but the success rate immediately after graduation shows the second-order stochastic dominance.

In assessing the causes of the significant impact of the process of forgetting when financial education is interrupted. We focused on the importance that students attribute to financial literacy. This has proved to be a decisive factor in the growth of the average level of financial competence, how it was published in (Kozubikova, 2017). It was, therefore, reasonable to assume that importance would also be a factor affecting the durability of knowledge or even further improvement.

Our assumption was confirmed when dividing the research samples into groups of respondents who attribute a high level of importance to financial literacy and respondents who perceive it as of little importance. After evaluating the results in both groups, we performed tests for equality of means,

whose results are summarized in Table 4. While in the group of students who attribute a high level of importance to financial literacy, the average percentage success rate has even increased, in the second group the hypothesis of equality of mean values can be rejected at a confidence level in exceeding 99%.

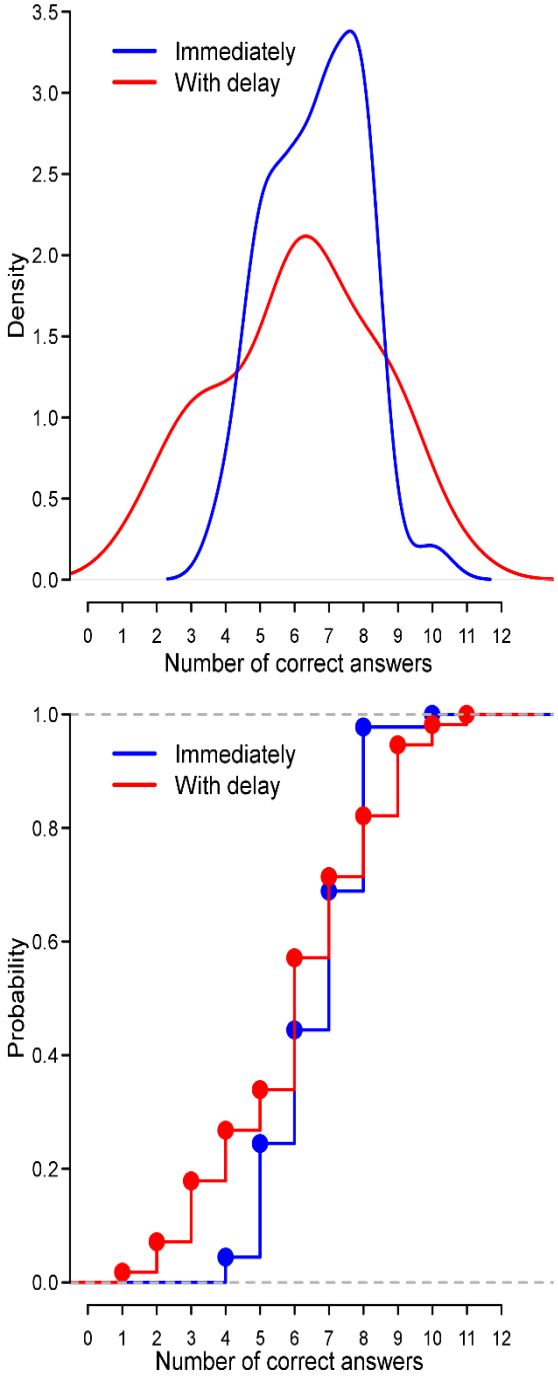

Fig. 3 The empirical densities of the percentages (upper side) and empirical cumulative distribution functions of the percentages (lower side) immediately after absolving the course and with half-year delay. (Own elaboration)

We illustrate the densities and cumulative distribution functions of the average percentage of success in the subset of respondents who consider financial literacy to be of little importance in Figure 5. The figure shows a shift in the probability distribution of percentage towards lower values. This shift is so significant that from distribution functions we see that they do not cross and the percentage success immediately after graduation dominates in terms of stochastic dominance of the first-order.

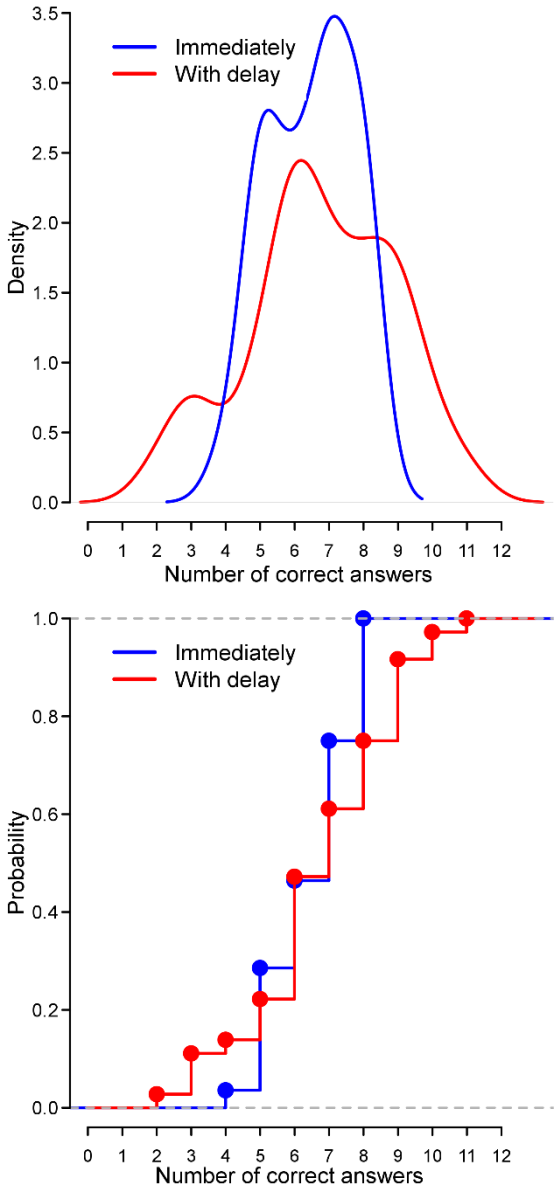

Fig. 4 The empirical densities of the percentages (left side) and empirical cumulative distribution functions of the percentages (right side) in the group of respondents that consider the financial literacy to be highly important, immediately after absolving the course and with half-year delay (Own elaboration)

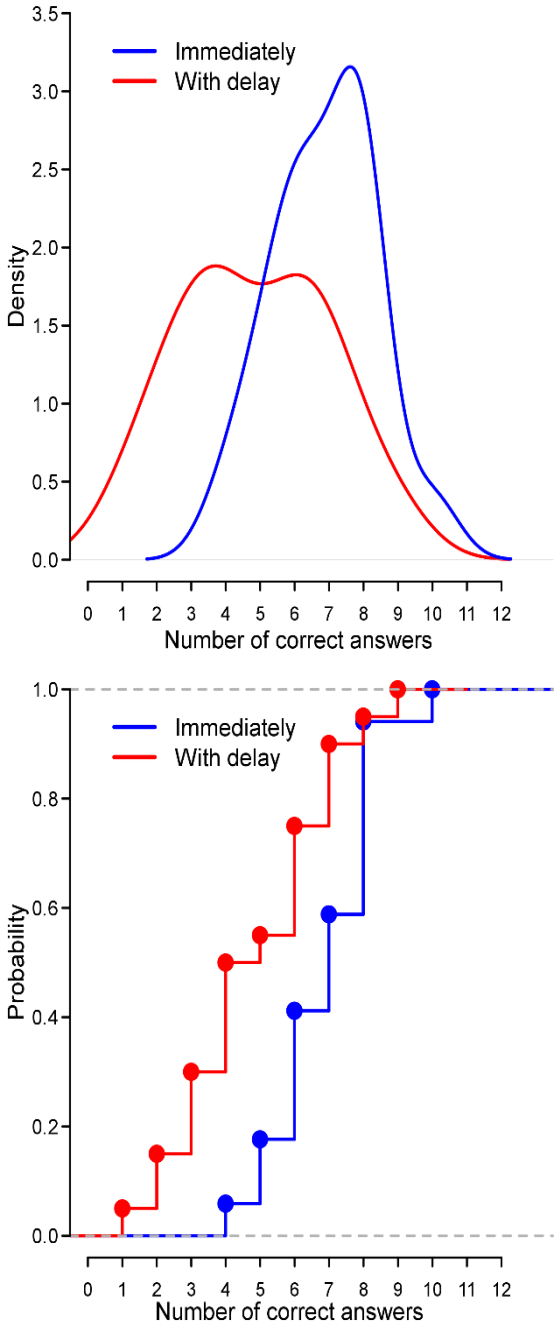

Fig. 5 The empirical densities of the percentages (upper graph) and empirical cumulative distribution functions of the percentages (lower graph) in the group of respondents that consider the financial literacy to be a little important, immediately after absolving the course and with half-year delay. (Own elaboration)

The empirical densities of the percentages (upper graph) and empirical cumulative distribution functions of the percentages (lower graph) in the group of respondents that consider the financial literacy to be highly important, immediately after absolving the course and with half-year delay has therefore been shown that the level of perception of the importance of financial literacy is decisive for the effectiveness of financial education and the retention of acquired knowledge and competences. On the contrary, underestimation of this importance leads to a significant decrease in skills and manifestation of short-term memory only after preparation for the completion of the education cycle.

Table 4 *Results of the Welch t-test of the equality of average percentages immediately after the course and after half a year after the course by groups according to the financial literacy importance perception. Source: Own elaboration.*

Importance	**Very important**		**Little important**	
Measured	**Anon**	**Later**	**Anon**	**Later**
Mean	49.72 %	52.14%	52.94%	37.31%
t-statistics	-0.7298		3.3422	
p-value	0.7658		0.0010	

5 CONCLUSIONS

Our research has confirmed the suggestion that students lose their financial skills and competences quite quickly when they interrupt their education process. This is partly due to the focus on fast, short-term memory, which is also reflected in tests from other subjects. However, it was also confirmed that the perception of the importance of financial literacy is also an important factor in influencing knowledge retention. These results also provide some lessons for the learning process itself and for teachers as creators of the education system. First, it is necessary to convince students of the importance of these problems not only for their professional but also for private life. In the end, who would entrust the management of their own business to a manager who cannot consolidate and manage their own finances? The second result is that training in financial management and financial decision-making should not be interrupted. On the contrary, in all follow-up disciplines, it is desirable that students learn to evaluate the financial impact of their decisions. Without evaluating this aspect, they cannot become a fully qualified manager.

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Received for publication:	26.12.2019
Revision received:	08.01.2020
Accepted for publication:	10.01.2020

How to cite this article?

Style – **APA** *Sixth Edition:*

Kozubik, A., & Kozubikova, Z. (2020, January 15). Financial literacy of the management students and durability of their knowledge. (Z. Cekerevac, Ed.) *MEST Journal, 8*(1), 65-74. doi:10.12709/mest.08.08.01.08

Style – **Chicago** *Sixteenth Edition:*

Kozubik, Ales, and Zuzana Kozubikova. 2020. "Financial literacy of the management students and durability of their knowledge." Edited by Zoran Cekerevac. *MEST Journal* (MESTE) 8 (1): 65-74. doi:10.12709/mest.08.08.01.08.

Style – **GOST** *Name Sort:*

Kozubik Ales and Kozubikova Zuzana Financial literacy of the management students and durability of their knowledge [Journal] // MEST Journal / ed. Cekerevac Zoran. - Belgrade – Toronto : MESTE, January 15, 2020. - 1 : Vol. 8. - pp. 65-74.

Style – **Harvard** *Anglia:*

Kozubik, A. & Kozubikova, Z., 2020. Financial literacy of the management students and durability of their knowledge. *MEST Journal,* 15 January, 8(1), pp. 65-74.

Style – **ISO 690** *Numerical Reference:*

Financial literacy of the management students and durability of their knowledge. **Kozubik, Ales and Kozubikova, Zuzana.** [ed.] Zoran Cekerevac. 1, Belgrade – Toronto : MESTE, January 15, 2020, MEST Journal, Vol. 8, pp. 65-74.

MEST Journal
DOI 10.12709/mest.08.08.01.09

EDUCATIONAL MIGRATION IN TERMS OF GLOBAL AND NATIONAL CHALLENGES

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JEL Category: **J11, I23, F66**

Abstract

The article deals with the problems of the expansion of international educational migration in modern conditions. It is emphasized that the economy of many countries in the world is facing the problems of loss of educated youth and the growing demand for attracted educated immigrants. Higher education in countries is considered as an area of increasing exports of educational services and a factor of attracting prospective international students as potential specialists for the national economy. Educational migration and academic mobility have been identified as forms of educational migration. Factors of influence on the increase of intensity of international educational migration are established. The authors study the main trends of educational migration flows from the point of view of their impact on both donor and host countries. The dynamics of the number of students entering and leaving the borders of some developed countries are given. It is emphasized that at the present stage of development of the world economy of the country there is a fiercely competitive struggle for young, initiative personnel. Therefore, governments are making changes to the laws of countries to improve the conditions of study, accommodation, and adaptation of foreign students. On the other hand, the authors emphasize the contradictory impact of migration capital on the economy of donor countries. Based on the example of Ukraine, the article analyzes national trends in educational migration. The causes of the widespread educational migration in the country are identified. This is, first, a difficult socio-economic situation in the country, a decline in the quality of national education, an increase in external educational

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migration. The dynamics of the recent flow of international mobility in Ukraine and the main directions of the direction of the educational migration of Ukrainians are presented. The necessity of state regulation is determined and the main directions of regulation of educational migration in Ukraine in the interests of preservation and development of intellectual capital and securing of competitive positions in the international market of educational services are outlined.

Keywords: *globalization, internationalization of higher education, educational migration, academic mobility, foreign student, loss of intellectual capital*

1 INTRODUCTION

Currently, globalization is a major trend in the development of various spheres, including politics, economy, and education. Opening borders and labor markets, reducing the cost of transport and communications are leading to increased mobility between countries. A characteristic tendency of the development of the modern education system is its internationalization and rapid growth of student migration.

Graduates of educational institutions under current conditions act as one of the most mobile population groups. Their migration intentions are less dependent on the circumstances. Unburdened by social obligations, young people are ready to travel from the regions to receive education in prestigious universities in the country and abroad. Thus, regions and countries lose talented youth, and as a result, there is a risk of significant loss of human capital. According to official data from TSN.ua (TSN.ua, 2019), about 70 thousand Ukrainian students study abroad. About 40% of them are educated in Poland. 55% of foreign students in Poland are Ukrainians, according to a survey by Selective.

Considering the state of general globalization and internationalization of the world space, it can be stated that migration is becoming one of the most important characteristics of the development of modern society. Usually, migratory flows are divided according to their goals into two types: economic and social. Social migration may include marital migration, educational and training migration, religious migration (pilgrimage), family reunification, tourism, recreation and treatment, ethnic migration, repatriation.

2 INTERNATIONALIZATION OF HIGHER EDUCATION: THEORETICAL ASPECT

The Law of Ukraine "On Higher Education" (Vidomosti Verkhovnoyi Rady of Ukraine, 2014), adopted in 2014, declared international integration and integration of the national higher education system into the European educational space one of the main principles of public policy in education. In the field of international cooperation, the Law identified twelve areas of activity for universities, including participation in exchange programs for students, teachers and researchers, the organization of international scientific events, etc.

Thus, educational and training migration is driven by the need to receive education and training.

According to Semiv (2013), the current stage of globalization, the Europeanisation of socio-economic processes and phenomena has defined educational migration as a meaningful, intellectually meaningful form of population migration. The possibility of free choice of a place of study for students' self-realization forms the basis for increasing the level and volume of inter- and intra-regional educational mobility. Other scholars (Filatov & Romashova) state that, on the one hand (from the point of arrival/departure territory), educational migration can be considered as a set of displacements of educational migrants, and on the other (from the position of an educational migrant) as a set of displacements to achieve the goal of migration.

Roshchin (Roshchin, 2010) offers to understand educational migration as one of the types of migration - the spatial displacement of people directly involved in the process of intellectual emigration. According to his interpretation, educational migration leads to the "leakage of young brains", if it becomes irreversible.

Educational migration is a broader concept than educational migration. Educational migration involves the educational activities of students studying under the bachelor's degree program, a master's degree program in a foreign university, conditioned by obtaining higher professional education based on generally accepted norms and rules of international educational activity. Educational migration also includes various internships, additional education, courses, and other forms of advanced training.

2.1 Academic mobility as a form of educational migration

To refer to the processes of moving people for research and academic education, the terms of cross-border education and academic mobility related to educational migration are additionally used in the expert environment. In the Law of Ukraine "On Higher Education" (Vidomosti Verkhovnoyi Rady of Ukraine, 2014), academic mobility is defined as an opportunity for participants of the educational process to study, teach, internship or pursue the scientific activity in another higher education institution (scientific institution) on the territory of Ukraine or abroad. Higher education applicants who apply the right to academic mobility during their studies, internships or scientific activities in another higher education institution (scientific institution) in the territory of Ukraine or abroad are guaranteed to maintain their place of study and receive a scholarship by the provisions on the application of the right to academic mobility. Such people are not deducted from higher education applicants. The documents of the Bologna Process, of which Ukraine has been a participant since 2005, distinguish between two types of academic mobility: vertical and horizontal. Vertical is interpreted as a full study of a student in a foreign university, and horizontal - as a study for a limited period. Cross-border education means (Kaleniuk, 2008) "all types of higher education programs or other types of educational services where their consumers (students) reside outside the country of origin of the educational organization providing the diploma."

Most professionals consider academic mobility and cross-border education to be the main institutional forms of educational migration, as the former involves moving between academic institutions and the latter between countries (including distance learning) in the educational process.

2.2 Factors influencing the formation and intensity of educational migration

The educational migration according to Katrovsky (Katrovsky, 2003) can be divided into three stages: preparatory, core and final. The preparatory stage of educational migration involves the formation of territorial mobility. This may include the formation of an information package on educational migration opportunities. For example, analysis of the general (demographic, economic, political) characteristics of the selected region and features of migration processes in it; problems (needs) of higher education institutions in the region); remote examination; previous acquaintance with the training programs; search for financial resources for education and living in the region where the educational process takes place, etc.

At the core stage of migration, the process of relocation and the related registration with law enforcement agencies and educational institutions, search for a place of residence and further occupation, preliminary acquaintance with the teaching staff and classmates (groupmates, colleagues), etc., take place.

The final stage involves adapting students to a new place of residence, to the population, to the educational process, and to solving many problems associated with it.

Educational migration today, according to Volokh & Grishaev, has a high degree of intensity, due to the following objective factors:

- enhancing the integration of education systems driven by the needs of global politics and the economy;
- increasing the importance of education as a result of the transition to information society (knowledge society);
- the need for continuing education and continuous training in response to increasing competition in the labor market;
- development of information technologies that allow educational institutions to increase their

information openness, increase the accessibility of their services to potential students;

- the orientation of the educational policy of many countries to the intensification of educational migration, increase of accessibility of educational services, internationalization of educational environment.
- the creation and effective functioning of international student exchange programs such as Erasmus, Erasmus Mundus, etc.

3 INTERNATIONAL EDUCATIONAL LABOR MIGRATION: CURRENT TRENDS AND CHALLENGES

UNESCO defines the category of foreign students as persons who have been allowed to undertake a specific program of study in institutions and schools of a country of which they are not nationals. Such migration is classified as temporary, limited by the amount of time it takes to complete the course. Migrants typically receive special student (non-immigrant) visas that entitle them to enter the country with their family members and limited employment opportunities.

Educational migration can be considered as a positive and negative factor for the development of the country.

In the context of increased migration flows worldwide, educational migrants can be considered as the most desirable category, as it is composed of young and initiative people who are open and willing to embrace new knowledge and technology. They adapt quickly to the local labor market and adapt to the linguistic and cultural environment.

The leader in the global education market is the United States, which enrolled 964,897,000 international students in 2017, accounting for about one-fifth of all international educational migrants. The top five also included: The United Kingdom (8.2%), Australia (7.2%), Germany, France (4.9% each), the Russian Federation (4.7%). This is practically half of all international students. Countries such as Canada, Japan, China, Turkey, Italy, and Spain are successfully competing with the leading countries in the field of educational migration. The global educational space has greatly accelerated student movements towards universities in countries such as Malaysia, Singapore, Egypt, Saudi Arabia, United Arab Emirates.

According to UNESCO-UIS (UNESCO-UIS, 2019), 3302.3 thousand foreign students enrolled in high-income countries in 2017. There are 2107.3 thousand educational migrants in European countries.

Not to mention the reverse movement of students, even from the leading countries. According to 2017 data, 976,000 people went to Europe to study, 928 people from China, 390,5 people from Africa, and 332 from India. Much less young people went to study in Germany (122.2 thousand people), France (89.4 thousand people), the USA (86.6 thousand people), Italy (74.3 thousand people), Spain (41,4 thousand), Slovakia (32,4 thousand) (Fig. 1).

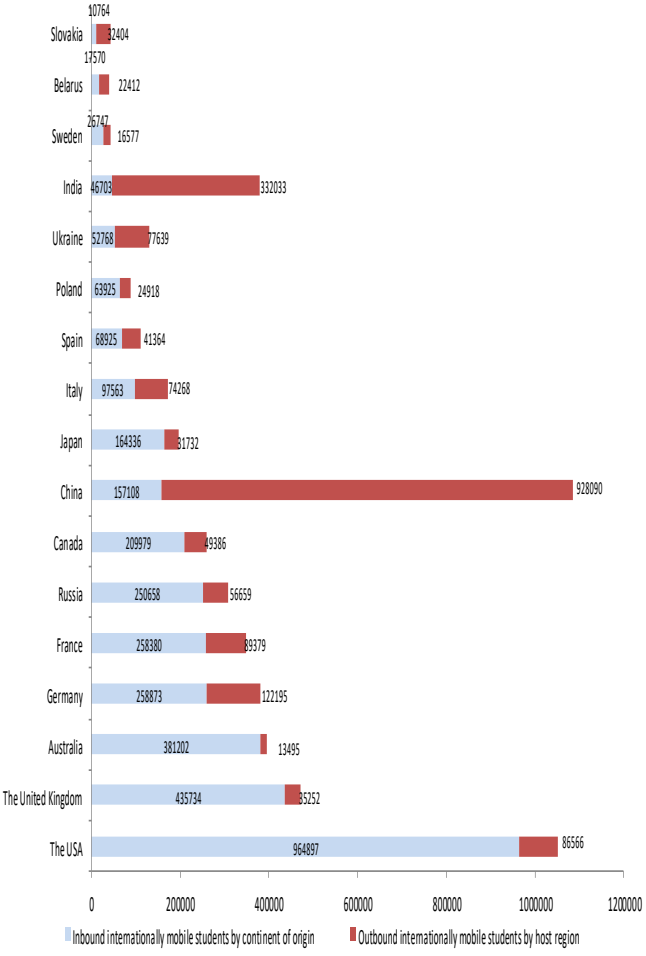

Fig. 1 Trends in the world of education: the number of inbound and outbound students (UNESCO-UIS, 2019)

Thus, according to the UNESCO forecast, by 2025 the number of foreign students will reach 7 million (UNESCO-UIS, 2019).

By 2020, China plans to become Asia's most attractive destination for international students. 500,000 foreign students are expected to study at higher educational establishments in the PRC. At the end of the twentieth century, China implemented a reform of higher education. As a result, in 2019, 40 Chinese universities entered the QS World University Rankings. Six Chinese universities are in the top 100 list. Moreover, in the ranking of the best universities in developing countries Times Higher Education (THE) in 2019, 72 Chinese universities, and 4 of them occupy leading positions. For example, in this rating, Russia is represented by 35 higher education institutions, the best of which, Moscow State University. Lomonosov, placed on the fifth step (Kapalina, 2019).

In Presidential Decree # 204 of the Russian Federation V. Putin from May 7, 2018 "On national goals and strategic objectives of the Russian Federation for the period up to 2024" (Decree of the President of the Russian Federation, 2018) formulated state setting by 2025 to prove the number of foreign students enrolled in higher education educational institutions up to seven hundred and ten thousand people.

Student youth is the most active social group. It is easier than other segments of the population to adapt to new living conditions. International students who stay after graduation in the host country increase its socio-demographic potential. During their studies, they learn the language, become familiar with the local culture, and generally become sufficiently adapted to the national labor market. Educational migration, in this case, allows compensating for the negative consequences of depopulation and aging of the population by replenishing the labor market by workers of working age, in particular, specialists in the field of information technology, science, health care, education, etc.

For host countries, educational migration is a potential source of labor, contributing to a change in GDP, as well as a significant resource for the educational services market, currently estimated at $ 60-65 billion, including 40% of the US and UK. This amount includes tuition, accommodation, transportation and other expenses for foreign students, interns and graduate students. The education market is projected to reach $ 90 billion. Exports of educational services have already brought about $ 30 billion to OECD countries, accounting for 3% of total services trade. For example, in Australia, revenue from trade in services and goods related to education is the third most important export item of services, accounting for 12% of its volume.

The structure of the social relations of foreign students includes not only regular contact with the local population, classmates, and teachers. It also brings together scientific, academic and professional relationships. Support for international educational migration can be seen as a way of influencing the formation of the future elite in donor countries and as a form of investment that has a multiplier effect in the medium term. Through students studying in foreign countries, donor and recipient countries are much more effective in enhancing cooperation with one another.

Thus, the internationalization of higher education provides maximum economic benefits in a short timeframe, strengthening the country's geopolitical position. So, for the 2013-2014 academic year, France earned 1.5 times more than allocated for the study of foreign students. In particular, the state spent $ 3.5 billion on scholarships and subsidies and paid $ 5.4 billion for accommodation, travel, and travel. In 2014-2015 in the UK, international students paid about $ 4.8 billion for education, spending another $ 5.4 billion on various goods and services in the country, supporting 207,000 jobs (Ibraev, 2018). Revenues from enrollment in Russian universities of foreign students (5top100.ru, 2018) amounted to more than 84 million rubles in 2017, in 2018 - more than 96 million rubles.

It should be noted that the export of education services is not just about the extra income. For example, the average cost of studying for foreigners in the US is close to $30,000, but more strategically, it is important for high school leaders to increase their awareness in the world and integrate the best practices of foreign education into learning processes. That is, with the growth of the total number of mobile students, the direction of international education has changed: now it is

not only an integral part of large exports but also an important component of diplomacy, trade policy, as well as intercultural ties between different countries, which reflects current trends in social development.

In 2017, Ukraine ranked 44th in the ranking of countries in the index of education development index 0.794. Fig. 2 presents the dynamics of the number of students from Ukraine who studied during 2013-2017 abroad, as well as foreign students who studied in this period in Ukraine.

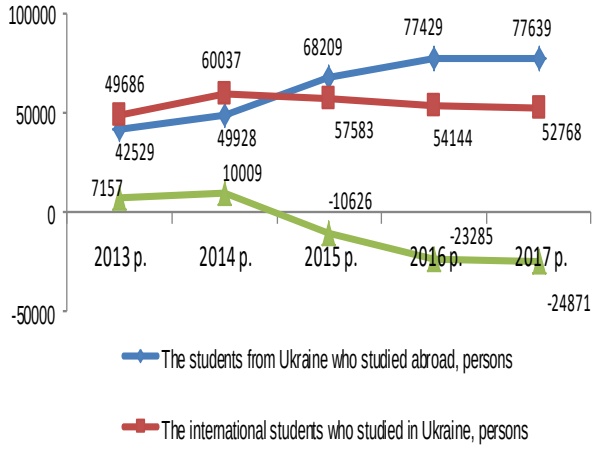

Fig. 2. The net flow of international mobility in Ukraine in 2013-2017 (Ministry of Education and Science of Ukraine, 2019)

In 2018, 75,605 international students were studying at higher education institutions in Ukraine. Among them are students from 154 countries, including India (19.8% of total students), Morocco (9.8%), Azerbaijan (8.2%), Turkmenistan (6.7%), Nigeria (4,7%) and other countries (Ministry of Education and Science of Ukraine, 2019). Foreign students study in Ukraine at 443 higher education institutions in such specialties as "Aviation and rocket technology", "Applied physics and nanotechnology", "Gas and petroleum engineering and technology", "Shipbuilding", "Atomic energy research", Agronomy, Biology, and Genetics. However, the most popular is the specialty "Medicine and Pharmacology". The most popular medical universities among foreign students are Kharkiv National Medical University, Odessa National Medical University, National University named O. Bogomolets (Kyiv) and others. In Chernivtsi, foreign students are trained by the Bukovyna State Medical University. In 2018, 1,723 students studied there.

The overwhelming majority of foreign students receive higher education in Ukraine as their primary education (87.5%). However, there are 9.5% of those who came to study the language (language training), to receive the second higher education (postgraduate education) - 2.0% and to study in postgraduate or doctoral studies - 0.9%.

According to Expat Insider 2016, Ukraine has become the most affordable country in terms of living expenses, ranking second in terms of personal financial satisfaction (Ministry of Education and Science of Ukraine, 2019).

Consequently, the number of foreign entrants seeking Ukrainian education is increasing every year. Young people are attracted to easy access to Ukrainian universities, relatively low cost of living and studying at the university and our country's proximity to Europe.

However, there are some problems. Regarding the quality of education, it should be noted that in the world ranking of the best Times 2018 universities (Chundak, 2018), our universities have dropped to 800 - 1100 positions out of a total of 1102. In total, only five national educational institutions are ranked. This situation may be justified by the lack of funding for national higher education institutions, the inability of teaching staff and students to participate in international scientific projects due to high competition and other reasons.

It is impossible not to mention the problematic circumstances that foreign students face when starting their studies in Ukraine. First, it is communication in a foreign language. The level of adaptation of students depends on the speed of mastering their state language. Foreign students need to spend a lot more time studying. Besides mastering the oral and written language, they need to learn a written academic culture to be able to perform scientific research, prepare individual and independent assignments. Also, they must lead an independent life, including solving household problems, attending shopping and leisure facilities, etc., which also requires a knowledge of the language. The culture of food consumption and the rules of behavior at catering establishments in all countries are different, and it will take a long time for a foreigner to become accustomed to foreign characteristics.

A significant problem for international students may be living conditions in university dormitories. The quality of residential services provided in hostels leaves much to be desired. A large number of people complain about the lack of repair and accommodation in one room.

Last but not least, the financial side plays a role in the number of problems of foreign students. In Ukraine, foreigners only study on a contractual basis. Therefore, they often lack the resources to pay for their education and to maintain a normal standard of living. They are usually not permitted to receive loans or other financial assistance. It is also very unlikely that a foreigner is legally able to get a job.

Foreign students may have another problem - social. The study found that most international students are quite sociable and have a wide range of communication. However, they are still far from home, and therefore far from relatives and relatives. Also, such loneliness sometimes even leads to depression.

Let us now evaluate the trends of educational migration of Ukrainian youth.

Dissatisfaction with the quality of national education, the lack of the need to enter a foreign university as a result of external education evaluation, the desire to obtain a foreign diploma, stay to live and work in another country, these and other reasons are pushing Ukrainian youth to go abroad. For the period 2013-2017, the number of Ukrainian students studying abroad increased by 35,110 students, or by 82.6%.

Most often, Ukrainians choose higher education institutions in Poland, the Czech Republic, and Germany. Currently, about 40,000 students from Ukraine study in Poland. Poland is close to Ukrainians in territorial and cultural terms. The similarity of mindsets between countries, the availability of Polish language learning, makes it easier and faster for our students to adapt to universities. On, special scholarships and grants allow students to study for free.

Ukrainian students chose Germany because there is an opportunity to study for free or at a reasonable cost. There is an opportunity to receive a scholarship. According to many young people, the German universities provide quality education and high professional knowledge. They also provide students with comfortable living conditions.

The number of Ukrainians studying at universities in the Czech Republic and Slovakia is increasing every year. The Czech Republic also provides an opportunity to study for free, especially for students who choose the Czech language curricula. The number of young people who want to study in Slovakia has increased significantly. If less than 400 Ukrainian citizens studied there in 2016, then in 2018 - nearly one and a half thousand.

More and more Ukrainians are choosing universities in Spain, Italy, Canada, Austria, the United Kingdom, France, and other countries.

However, it should be noted that educational migration is widespread and in this case, has a negative context for the state. Today, student youth migration is particularly strong as youth is the most mobile population. Student youth, who have not been able to socialize and adapt within the university, leave the country for further adaptation abroad, while coping well with this and leaving their homeland forever. That is, Ukrainians use education as a way to emigrate from the country. This is a very dangerous phenomenon. It is actually a loss of the intellectual potential of the country. Moreover, the state does not take any measures to return young people, for example, it does not create attractive jobs. For 13 years, 250,000 young highly qualified people have left Ukraine. These are carriers and producers of new knowledge.

4 CONCLUSIONS

Thus, international educational migration is the displacement of people between countries to receive education at different levels and at different times. These include the movement of students, secondary and post-secondary students, postgraduates, doctoral students, and trainees, professionals upgrading their qualifications in different educational institutions, structures, and companies. An integral part of educational migration is the flow of educational migrants, which are oriented to educational institutions (colleges and universities). The standardization of educational programs and the increasing availability of foreign training courses help to increase the number of students interested

in obtaining a foreign diploma. Thus, modern education is becoming cross-border, characterized by increased mobility of students and teachers. Most of them believe that their education will promote career development, allow them to find a job in their chosen country and possibly obtain a permanent residence permit.

Student migration today is the best way to attract young, active, initiative and highly qualified people who are open and willing to embrace new knowledge and technology. At the present stage of the development of the world economy, the countries are fiercely competitive for skilled labor. However, the massive departure of young people abroad, and most importantly their unwillingness to return, poses a great danger to the state, which can lead to loss of intellectual capital of the country. If society is unable to provide young people with work, then there is no future. Youth and their most active part - students do not want to live in a developing country, they seek to live in a progressively developed society, to feel the need for self-fulfillment and career growth.

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Received for publication: 26.12.2019
Revision received: 08.01.2020
Accepted for publication: 10.01.2020

How to cite this article?

Style – **APA** *Sixth Edition:*

Luchyk, S., Luchyk, V., & Luchyk, M. (2020, January 15). Educational migration in terms of global and national challenges. (Z. Cekerevac, Ed.) *MEST Journal, 8*(1), 75-83. doi:10.12709/mest.08.08.01.09

Style – **Chicago** *Sixteenth Edition:*

Luchyk, Svitlana, Vasil Luchyk, and Margaryta Luchyk. 2020. "Educational migration in terms of global and national challenges." Edited by Zoran Cekerevac. *MEST Journal* (MESTE) 8 (1): 75-83. doi:10.12709/mest.08.08.01.09.

Style – **GOST** *Name Sort:*

Luchyk Svitlana, Luchyk Vasil and Luchyk Margaryta Educational migration in terms of global and national challenges [Journal] // MEST Journal / ed. Cekerevac Zoran. - Belgrade – Toronto : MESTE, January 15, 2020. - 1 : Vol. 8. - pp. 75-83.

Style – **Harvard** *Anglia:*

Luchyk, S., Luchyk, V. & Luchyk, M., 2020. Educational migration in terms of global and national challenges. *MEST Journal,* 15 January, 8(1), pp. 75-83.

Style – **ISO 690** *Numerical Reference:*

Educational migration in terms of global and national challenges. **Luchyk, Svitlana, Luchyk, Vasil and Luchyk, Margaryta.** [ed.] Zoran Cekerevac. 1, Belgrade – Toronto : MESTE, January 15, 2020, MEST Journal, Vol. 8, pp. 75-83.

MEST Journal
DOI 10.12709/mest.08.08.01.10

OPTIMAL HOTEL MANAGEMENT THEORY: ANALYTICAL ASPECT

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JEL Category: **H10, O10, C60**

Abstract

The article investigates new trends and tasks of management in the hotel industry through the prism of the modern theory of optimal management. The model of an optimal structure formation for the volume of hotel services sale has been presented, which takes into account the proportion of profitability of hotel accommodation sale of the corresponding type in the overall profitability of hotel services sale, which is established in the form of a linear programming task. The implementation of the optimal assortment policy has been corroborated, which will give positive results in the in-depth operational analysis of profitability by hotel room types. It is proved that the pricing policy of hotel properties should be based on determining the equilibrium price i.e. taking into consideration the function of supply and demand on the hospitality market. To determine the equilibrium price formed on the hospitality market, it is suggested to use a "cobweb model", the essence of the model is that suppliers respond to prices with a certain delay ("time lag"). It is substantiated that by determining the equilibrium price of the forecasted period, a hotel enterprise can form a pricing strategy based on the possible supply and demand on the hospitality market in general. In order to implement a rational assortment policy in analyzing the profitability of hotel establishments, it is suggested to use the method of optimal management, grounded on the distribution of the volume of accommodation deals by room types in accordance with the optimal structure at a given vector of the objective. At the same time, it is recommended by the authors to determine the amount of demand for accommodation services in the forecasted period

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via the Markov chain method. Simulation modeling of hotel enterprises' performance will allow developing managerial decisions that will help to increase the overall profitability of the hospitality business. The authors propose to improve the methodology of analysis within strategic management by integrating conventional analysis methods with less traditional such as multidimensional analysis; investigation of innovational performance; forecasting method, imitation and stochastic modeling of business processes in the hospitality industry.

Keywords: *management, hotel, analysis, administration, price, revenue, profitability, strategy*

1 INTRODUCTION

Nowadays the tourism industry becomes the leader of the world economy. Tourism accounts for about 12% of the world gross product, more than 30% of international trade services, 11% of world consumer spending and 7% of total investment. According to the World Tourism Organization (WTO) forecasts, the number of tourists will reach 1561,1 million people by 2020, with revenues from tourism amounting to the US $ 2 trillion and travel expenditures increasing on average to US $ 1,248 (Grechanik, 2017).

The number of foreign tourists who have visited the country is a significant element in the hospitality industry as it contributes to the development of several industries that are directly involved in catering for them. This leads to an increase in gross domestic product volumes and augments the standard of living in the country.

The largest share of a tourism product cost is constituted by temporary accommodation (lodging) services, therefore, considering the above-mentioned trends, domestic enterprises of the hospitality industry need to improve the quality of their services. In modern conditions, hotel establishments as business entities include the following types of enterprises: hotels, hotels with office centers, motels, campgrounds, youth hostels, and mountain shelters, premises adapted for hotels, dormitories and other temporary residences' facilities.

Hotel business is extremely dynamic – dozens of big deals are being made in the world over the year, such as the acquisition of Hilton Hotels Corp by Blackston Group, launch of new brands like All Seasons by the French Accor Hotel Corporation and hundreds of management, franchise purchase and hotel transfers to other networks (Samartsev, 2008).

Self-planning of its performance by a hotel enterprise requires constant monitoring of the market condition, readiness for market fluctuations in order to ensure the implementation of the optimal management and economic survival strategy in the conditions of competition and crisis in the economy.

2 NEW MANAGEMENT POLICY

The economic crisis is a period for finding the most effective business solutions. Structural changes in the Ukrainian hotel business require the introduction of unified technologies in order to create a new policy for the hotel brand: improving the quality of services provided by the hospitality industry.

World experience shows that the hotel industry can also be developed in times of economic crisis, as the cost of creating one workplace here is 20 times lower than in manufacture and the turnover on capital investment is 4.2 times higher than in other industries.

Hospitality management is reflected in the works of such foreign and domestic scientists as Andrenko, 2015; Baylik, 2018; Boyko, 2011; Zmiev, 2015; Kuznetsova, 1997; Munin, 2015; Musakin, 2018; Putsenteilo, 2017; Roglev, 2015; Samartsev, 2015; Tkachenko, 2018. The solution to the problem of effective management of financial results from accommodation in the long-term time span is to find the optimal structure of management parameters, i.e. the optimal range of hotel rooms.

As a vector of the objective, the value of the reference income from the provision of accommodation by room types is the strategic goal of the financial and economic activity of hospitality establishments overall. Accordingly, the achievement of the above objective is the basis for the development of a hotel growth strategy.

Depending on the set objective, one or another management model is implemented, which presupposes a specific method of problem-solving

in goal attainment. Among these methods, techniques of optimal control are of interest.

The primary task for the effective management of a hotel enterprise is to determine the optimal range of hotel services, the variety of which is primarily determined by the number of facilities provided as well as the general condition of the material and technical base.

A key factor in achieving the competitive advantage is the determination of a required list of room types while the selection of additional services is a means to raise the hotel property to a higher stage in development. Establishing the optimal structure of hotel services permits to optimize the price per room and the overall hotel tariff amount.

The problem of the optimal mixture of hotel services is extremely topical, due to the considerable costs of accommodation downtime. That is, if the structure of accommodation types does not reflect consumer demands, costly, inefficient service industry units are being created, an atmosphere of dissatisfaction with services is being formed, which negatively affects the image of the hotel property, thus an artificial deficit on certain categories of rooms that are in demand is being created.

2.1 Optimal management strategy

The efficiency of hospitality enterprises can be significantly improved if one optimizes the structure of hotel services sale volume to ensure the maximum possible income.

The choice of the optimum criterion depends on the goals of an enterprise. In the hospitality sphere, the strategy that will maximize sales, boost profits or minimize costs may be optimal. The implementation of this strategy will allow the hotel industry to achieve the reference state – that is a standard level of profit and effectiveness for each time step according to the optimal structure of hotel services by room types.

Therefore, an important task of analyzing the financial results from the provision of accommodation is the formation of the optimal mixture and structure of the volume of hotel services sale by category of rooms. In conditions where the hotel companies independently set the prices for lodging, considering their sales outlay, optimizing the volume of sales by separate types of hotel rooms allows you to adjust the amount of desired profit.

Therefore, we suggest using the model of an optimal structure formation for the volume of hotel services sale which will provide maximum profit. The mentioned model is based on considering the proportion of profitability of hotel accommodation sale of $j-$type in the overall profitability of hotel services sale and formalized as a linear programming task:

$$V_1+V_2+...+V_n=V, \quad (1)$$

$$P=\alpha_1 V_1+\alpha_2 V_2+...+\alpha_n V_n \longrightarrow \max, \quad (2)$$

where

$\alpha_j -$ is the level of profitability of a $j-$type of hotel room sale;

$j=1,2,...,n;\ n-$ is the number of room types;

$V_j -$ is the volume of the $j-$ type of hotel room sale in terms of value;

$V -$ is the volume of hotel services sale;

$P -$ is profit from the sale of hotel services.

To optimize the structure of hotel services sales volume, the following information is required:

$E_j -$ the share of the $j-$type of hotel room in the actual structure of hotel services sale;

$P_j -$ profits received from the sale of the $j-$ type of hotel room;

$\beta_j -$ the proportion of the $j-$type of hotel room sale in the optimal structure of hotel services sales volume;

$V^* -$ the anticipated value of hotel services sales volume (calculated by the Markov chain method);

$P_j^* -$ the anticipated amount of profit from the sale of a $j-$category hotel room;

$P^* -$ the anticipated amount of profit received from optimizing the structure of hotel services sale.

That is, at the initial stage the profitability of $j-$ type hotel room is calculated:

$$\alpha_j=\frac{P_j}{V_j}, \quad (3)$$

and the optimal structure for accommodation services sale is determined:

$$\beta = (\beta_1, \beta_2, ..., \beta_n), \quad (4)$$

where $\beta_j = \frac{\alpha_j}{\sum_{j=1}^{n} \alpha_j}$. (5)

After completion of the above calculations, a forecast of sales volume is made for the future (by Markov chains method).

In the next stage, the volume of hotel services sale is distributed according to the optimal structure and the estimated amount of profit from the sale of a hotel room of j – type is calculated:

$$P_j^* = \alpha_j V_j^*, \quad (6)$$

where V_j^* – is the sales volume of a hotel room of j – type according to the optimal structure of hotel services sales volume.

After that the forecasted amount of profit from the sale of all n (categories) of hotel rooms is estimated according to the optimal structure of hotel services sales volume:

$$P^* = \sum_{j=1}^{n} P_j^*, \quad (7)$$

The last step is to calculate the general level of profitability of the hotel business performance (α):

$$\alpha = \frac{P^*}{V^*}, \quad (8)$$

It is worth noting that the implementation of such an assortment policy will give positive results in concert with an in-depth operational analysis of profitability by types of hotel rooms of a hospitality enterprise. The efficiency of financial and economic activity of the hotel industry enterprises and their competitiveness on the market as a whole can be achieved by providing the client with the best hotel service, that is, a service which, from the customer's point of view, is of high quality, price and other parameters that fully satisfy his or her needs.

Considering everything mentioned above, the priority of any hotel enterprise is to ensure an effective process of producing qualitative services. However, in the course of its implementation, the main problem is not the lack of sufficient financial and material resources, but the inefficient management of these resources as well as insufficient supervision of the production and sales processes, which happen simultaneously.

2.2 Cobweb model

Ukrainian scientists emphasize that modern systems of hotel services sales, constant analysis of competitors and the market, the level of technological process efficiency, trained personnel, competitive price, active demand stimulation are important means (Musakin, 2008).

It is worth highlighting a competitive price among these factors, because the relationship of price per room, the number of accommodation deals of this type, and the amount of expenses involved into the planned occupancy of the total number of rooms are considered during the analysis of financial results from the provision of lodging by room types.

The introduced pricing policy of the hospitality establishments should be based on determining the equilibrium price, i.e. considering the demand and supply function in the hotel services market.

Knowing the supply and demand for accommodation services, one can determine the equilibrium selling price, which will permit to formulate a pricing strategy. It is advisable to carry out the construction of supply and demand functions in accordance with hotel services prices based on correlation analysis (Shalanov, 2006).

According to statistical data on the hotel services' market, the function of demand $D(t)$ which depends on the price $P(t)$ at a definite time t is built as well as the supply function $S(t)$ dependent on the price of the previous period.

A cobweb model can be used to determine the equilibrium price generated in the hotel services market. The content of this model is that the supplier responds to prices with some delay ("time lag"). That is, the supply of the current period $S(t)$ is determined by the price of the previous period $P(t-1)$, while the demand $D(t)$ is determined by the price of the current period $P(t)$; prices for each

period are set at a level at which supply and demand reach balance – $D(t)=S(t)$.

3 MARKOV CHAIN METHOD

However, the web-based method of pricing on the basis of equilibrium on the hospitality market has one major drawback: the demand function is based on information about all hotel services of a similar nature, not just taking into account the demand for services of the establishment under investigation.

This disadvantage is quite important because the demand for hotel services depends on the quality of service of a hotel property, that is, if a customer is not satisfied with the level of service in one hotel, he will look for another, where he may be provided with this service at a better level (Shalanov, 2006).

This deficiency can be eliminated if the demand for lodging services in the forecasted period is determined using the Markov chain method.

The Markov chain can be constructed as follows: the likelihood of a customer returning to a hotel business is conditioned by the quality of hotel service they provided at the accommodation property last time. That is, it is determined by the degree of satisfaction of the consumer's needs.

Possible changes in the demand for accommodation services of the respective hotel establishment on the hospitality market can be described by some system S, which may be in one of the conditions $\varepsilon_1, \varepsilon_2, ..., \varepsilon_n$, and may also change its condition at the moments of time $t_1, t_2,$ $\ldots t_m, \ldots (t_1 < t_2 < t_m$ <t…). The probability of the system at t moment to be in a condition e_j depends only on what condition the system S was in at the moment of time t_{m-1}. This probability is called transient and is denoted by $P_{ij}^{(m)}$:

$$P_{ij}^{(m)} = P_{im}(\varepsilon_i \to \varepsilon_j). \quad (9)$$

Since the system can be in one of the *n* conditions, the overall probabilistic pattern of change will be represented by the matrix:

$$P = \begin{bmatrix} p_{11} & p_{12} & \cdots & p_{1n} \\ p_{21} & p_{22} & \cdots & p_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ p_{m1} & p_{n2} & \cdots & p_{nn} \end{bmatrix}. \quad (10)$$

This matrix is called the transition matrix (“time is a sign”) or the transitive matrix. The elements of this matrix are satisfied with the following terms:

$$0 \le P_{ij} \le 1, \ \sum_{j=1}^{n} P_{ij} = 1. \quad (11)$$

For a homogeneous Markov chain, we can determine the indisputable probability of finding the system S at the *m*-th step in the condition ε_j $(j = 1, 2, ..., n)$:

$$p_j(m) = P\{S(m) = \varepsilon_j\}, \quad (12)$$

$$p_i(0), \quad (i = 1, 2, ..., n), \quad \sum_{i=1}^{n} p_i(0) = 1, \quad (13)$$

If the transitive probabilities matrix is given $\|p_{ij}\|$, then the initial probability distribution is calculated by the formula:

$$p_j(m) = \sum_{i=1}^{n} p_i(m-1) \cdot p_{ij}, \quad (k = 1, 2, ...; n). \quad (14)$$

Therefore, knowing the prices of the forecasted period, the hotel business can formulate a pricing strategy based on the possible demand for hotel services.

The strategic direction of the procedure for choosing the optimal standard range of accommodation services involves determining the estimated value of the need – that is, the volume of hotel services sale. Therefore, let’s apply this methodology to determine the size of the expected volume of accommodation services by room type, based on existing trends in demand and internal capacity of the enterprise.

In order to implement a rational assortment policy in analyzing the financial results of the hotel industry, it is proposed to use the method of optimal management, based on the distribution of the volume of sales of accommodation services by types of rooms in accordance with the optimal structure by a given vector of the objective. In this

case, it is advisable to determine the amount of demand for accommodation services in the forecasted period using the Markov chain method.

The content of this method is the necessity to formulate an objective first, and more precisely, a vector of objective according to which the control parameters are distributed (Shalanov, 2016).

The management parameters will be represented by the amount of sales of accommodation services by type of rooms (in terms of assortment) since the level of hotel enterprise efficiency depends on the structure of the volume of hotel services sale. Thus, it is necessary to determine the structure that will maximize profits in accordance with the vector of the objective.

The matrix equation of the theory of optimal control is a working model:

$$X^* = FX_0 + GU^*, \quad (15)$$

where $X_0 = \left(X_1^0, X_2^0, ..., X_n^0\right)$– are values of indicators that describe the object of study at the beginning of the period (the amount of revenue and profit from the sale of hotel services of the hotel establishment);

$X^* = \left(X_1^*, X_2^*, ..., X_n^*\right)$ – indicators reference values or vector of the objective;

$U^* = \left(U_1^*, U_2^*, ..., U_m^*\right)$ – the values of control parameters that are required to achieve the reference values;

F – the transitive matrix of indicators X ;

G – the transitive matrix of control parameters U into indicators X .

The control parameters, as already mentioned, are the amount of accommodation services provided by types of rooms (you can also use, as an alternative, accommodation occupancy by room types).

To determine the structure of accommodation services sales volume, it is necessary to first find the reference values of sales amounts U^* by solving the matrix equation:

$$U^* = \left(G^T G\right)^{-1} G^T \left(x^* - Fx_0\right), \quad (16)$$

where T – stands for transport.

After that it is necessary to determine the share of sale volumes of each type of room in the total volume of accommodation services, as follows:

$$\gamma_j = \frac{U_j^*}{\sqrt{\sum_{j=1}^{m}\left(U_j^*\right)^2}}, \quad (17)$$

where $\gamma = \left(\gamma_1, \gamma_2, ..., \gamma_m\right)$ is the optimal structure of the services sale volume.

If the projected volume of hotel services sale for the next year is equal to K, then in terms of elements it will be distributed as follows:

$$U_j^1 = \gamma_j K. \quad (18)$$

At this volume of accommodation services sale, the indicators of a hotel property performance are calculated by the formula:

$$X^1 = FX_0 + GU^1, \quad (19)$$

that is $X^1 = \left(X_1^1, X_2^1, ..., X_n^1\right)$ – are the values of indicators that describe the hotel business performance (the amount of revenue and profit from the sale of hotel services), which it can achieve if one distributes sales volumes in the range optimally (by types of rooms).

Thus, the formation of an optimal structure of the accommodation services sale volume by room types in accordance with the vector of objective represents the optimal strategy for a hotel property. The implementation of this strategy will allow the hotel business to reach the reference state X^*, distributing the volume of hotel services sales for each time step according to the optimal structure, table, 1.

Table 1. Methods for calculating the matrix-F transition coefficients for Hotel "Tourist" (Chernivtsi, Ukraine)

№	Indicator	2017		2018	
1.	Net income	X_1^0	2380620	X_1^1	2636811
2.	Income	X_2^0	506120	X_2^1	492041
3.	The values of the conversion factors, f_{ij}	$f_{ij} = \frac{1}{n}\frac{X_i^1}{X_j^0}$		f_{i1}	f_{i2}
		f_{1j}		0,553	2.604
		f_{2j}		0,103	0.486

Matrix F :

$$F = \begin{pmatrix} 0{,}5538 & 2{,}6049 \\ 0{,}1033 & 0{,}4861 \end{pmatrix}$$

Matrix G :

$$G = \begin{pmatrix} 1{,}0018 & 1{,}0848 & 0{,}7886 & 0{,}8775 & 1{,}2372 & 1{,}1573 \\ 0{,}1869 & 0{,}2024 & 0{,}1472 & 0{,}1637 & 0{,}2309 & 0{,}2160 \end{pmatrix}$$

The next step is to generate the reference state of the study object. As a reference value of the volume of accommodation services of the Hotel "Tourist", we take the estimated projected volume of sales determined by the Markov chain method, which will be 2365250,00 UAH.

At the same time, the hotel enterprise surveyed plans to achieve a profitability increase of 3.3% compared to the actual results in the reporting period. Given these circumstances, the Hotel "Tourist" plans to profit from the provision of accommodation up to 519419,54 UAH in the future.

In such circumstances, simulation modeling of the hospitality establishment performance will allow developing managerial decisions that will help to increase its performance profitability in general.

Therefore, while analyzing financial results of the hospitality enterprises, it is advisable to use one of the economic methods – the optimal management method, which underlies a rational assortment policy, based on the distribution of the volume of accommodation services by types of rooms according to the optimal structure for a given vector of the objective. In this case, the simulation modeling of a hotel business performance will allow developing managerial decisions that will help to increase the profitability of its performance in general.

The application of the indicator of consumer demand satisfaction for hotel services and other market indicators leads to the review of the initial data on the formation of accounting and analytical information system for managing the profitability potential in the field of hotel services. The solution to this problem involves the development and implementation of innovative projects in the program of innovative performance that provides the optimum level of service with the rational use of resources in the hospitality industry (Efremova, 2013).

A balanced scorecard allows highlighting that, in many cases, the process of providing hotel services takes place without a proper understanding of the result and its value to the customers and shareholders of the hotel business. The efficiency of business processes determines the value of the hotel services supply, the number of applications for hotel rooms booking by their types and the final financial result from the provision of accommodation. Once the key business processes are identified, the profitability indicators of the hotel business are determined (Baryshev, 2012).

Thus, all areas of the balanced scorecard are interconnected and should contribute to the implementation of a single hospitality enterprise strategy (Baryshev, 2012).

The same opinion is held by Zenkina, (2009) since she emphasizes the current relevance of the balanced scorecard concept (BSC), which underlies strategic accounting.

A balanced scorecard is a hotel management system that provides a systematic implementation of its strategic plans, their interpretation in the language of operational management and control over the implementation of the strategy, considering key performance indicators in the hotel business.

The balanced scorecard is an innovative scheme that, while preserving the basic financial parameters, generates projected forms of financial statements for the hotel, assessment indicators of future major operating performance based on non-traditional multidimensional forecasting methods. In developing a balanced forecasting system, the hotel's potential profitability strategy covers the following areas: finance; customers of the hotel; business processes; human capital (Zenkina, 2009).

Each direction is formalized as prospective maps containing information about tasks, indicators, targets, and ways of achieving them.

A prospective map is a diagram or a picture that describes a strategy in the form of a set of prospective goals and causation between them. This scheme is used for logical and clear presentation and clarification of the strategy, transforming the strategy and specific plan of action. Translating the strategy into the language

of the logical regularities reflected in the strategic map allows each business unit and employee of the hotel enterprise to obtain a clear explanation of the essence of the strategy and the tasks for its implementation.

The process of building a prospective map makes the strategy "transparent", while its usage ensures the effectiveness of its implementation in the profitability management system of a hospitality business. First of all, a forward-looking analysis as a "prediction of the future" is closely related to forecasting and precedes strategic accounting, the formation of forecasted financial statements based on actuarial accounting data. That is, a prospective analysis is intended to broaden the horizons of forecasting, to create opportunities for timely feedback on changes occurring in the external environment (Zenkina, 2009).

4 CONCLUSIONS

Within the framework of the categorical apparatus development and the strategic management methodological tools, it is advisable to distinguish a prospective profitability potential; strategic climate; the strategic position of a hotel enterprise as its basic indicators for the hospitality industry. Prospective profitability potential is a measure of capability and capacity of a hotel enterprise to accomplish tasks that ensure the achievement of the set objective – the forecasted level of performance results. It is advisable to analyze the prospective potential of the hotel enterprise in the context of the following enlarged components of the internal business environment of the hotel business: functional unit (element of production functions and business processes); resource potential; organizational constituent; control component. In addition, as a key component of the prospective hotel potential analysis, it is advisable to highlight a block of predictive analysis of the level of target hotel services profitability achievement together with evaluative characteristics of the level of losses.

Peculiarities of analytical support for the management system, as a rule, are manifested in the development of methods and methodological tools for prospective analysis. Improvement of the analytical methodology within strategic management is carried out by integrating traditional methods of analysis with less conventional such as multidimensional analysis, analysis of innovative performance, forecasting, imitation and stochastic modeling of business processes in the hospitality sphere. Thus, accounting and analytical support for the management system of hotel-enterprises' potential is characterized by a wide range of features related to achieving the target level of hotel services profitability with a preliminary assessment of its negative change tendencies, information base, methodological tools, and analytical procedures.

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Received for publication: 24.12.2019
Revision received: 04.01.2020
Accepted for publication: 10.01.2020

How to cite this article?

Style – **APA** *Sixth Edition:*

Manachynska, Y., Luchyk, S., & Yevdoshchak, V. (2020, January 15). Optimal hotel management theory: Analytical aspect. (Z. Cekerevac, Ed.) *MEST Journal, 8*(1), 84-92. doi:10.12709/mest.08.08.01.10

Style – **Chicago** *Sixteenth Edition:*

Manachynska, Yulia, Svitlana Luchyk, and Volodymyr Yevdoshchak. 2020. "Optimal hotel management theory: Analytical aspect." Edited by Zoran Cekerevac. *MEST Journal* (MESTE) 8 (1): 84-92. doi:10.12709/mest.08.08.01.10.

Style – **GOST** *Name Sort:*

Manachynska Yulia, Luchyk Svitlana and Yevdoshchak Volodymyr Optimal hotel management theory: Analytical aspect [Journal] // MEST Journal / ed. Cekerevac Zoran. - Belgrade – Toronto : MESTE, January 15, 2020. - 1 : Vol. 8. - pp. 84-92.

Style – **Harvard** *Anglia:*

Manachynska, Y., Luchyk, S. & Yevdoshchak, V., 2020. Optimal hotel management theory: Analytical aspect. *MEST Journal,* 15 January, 8(1), pp. 84-92.

Style – **ISO 690** *Numerical Reference:*

Optimal hotel management theory: Analytical aspect. **Manachynska, Yulia, Luchyk, Svitlana and Yevdoshchak, Volodymyr.** [ed.] Zoran Cekerevac. 1, Belgrade – Toronto : MESTE, January 15, 2020, MEST Journal, Vol. 8, pp. 84-92.

MEST Journal
DOI 10.12709/mest.08.08.01.11

FINANCIAL FOCUSING ON ECONOMIC DEVELOPMENT SUSTAINABILITY

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JEL Category: **F63, F65, O11, Q01**

Abstract

The contemporary state intervention in the form of so-called monitoring economy (Siegel) implies a complementary response of the public sector to the economic actions of the private sector taken through supporting the development of the propulsive sectors, technical progress incentives, infrastructure financing, fiscal benefits, subsidies, and so on. In this context, modern states pay special attention to the economic development of underdeveloped areas aimed at harmonizing global, structural, sectoral, regional, inter-regional, sub-regional and local development. To accelerate the development of underdeveloped regions in developed industrial countries numerous mechanisms are used: subsidies, grants, lower interest rates loans, fiscal incentives and benefits, industry-targeted sales of land and buildings in undeveloped areas at affordable prices, providing benefits to the industry in purchase of scarce raw materials, determining preferential tariffs for public service obligations of state-owned enterprises to invest in undeveloped areas, administrative ban on new investments in highly developed and urban overcrowded regions, providing government subsidies in various forms (premiums for the purchase of capital equipment, premiums for hiring new workers, co-financing research). The paper hereof analyses the experiences of European countries that can serve the creators of the economic policies of the neighboring developing countries in order to promote regional economic development and equality.

Keywords: *Fiscal policy, sustainable development, subsidies, grants, fiscal benefits, fiscal incentives*.

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1 INTRODUCTORY PREMISES – GOALS OF SUSTAINABLE DEVELOPMENTS, GLOBAL FRAMEWORK

The Triple Vision of Sustainable Development is documented in the Rio 2019 Summit document: Confirming the Sustainable Development Certificate, which will be achieved by fostering sustainable, inclusive and equitable economic growth, creating greater opportunities for all, reducing inequalities, increasing basic living standards by fostering equitable social development and inclusion, and fostering integrated and sustainable management of natural resources and ecosystems, which, inter alia, support economic, social and humane development, while facilitating the protection, regeneration, and resilience of ecosystems as new challenges arise.

The Millennium Sustainable Development Goals have added to the document "The future we want" also the global fight against extreme poverty as a prerequisite for sustainable development. The new global agenda has now included the world community, governments, businesses, scientists, leaders, NGOs and students in the historic decision-making process of a sustainable development strategy. This has helped world leaders to form, through the UN, a Network for Sustainable Development Solutions that includes health, education, agriculture, cities, the energy system, biodiversity protection and more. (Sachs, 2014)

The Sustainable Development Solution Network has proposed 10 Sustainable Development Goals, which shape the global management of a sustainable development economy. The first Sustainable Development Goal incorporates the eradication of extreme poverty, hunger, underdeveloped children, malnutrition and food provision insecurity, and providing the necessary support to disadvantaged countries. The second objective of sustainable development is to achieve economic development within the planetary boundaries, to secure sustainable production and consumption, to stabilize the global viewpoint, to ensure rational use of energy and to focus on growing food crops, building cities and environmental sustainability. The third objective of sustainable development implies the provision of effective education for all children and young people on their way towards a decent job, adequate qualifications and effective learning in line with technological changes. The fourth objective of sustainable development incorporates the achievement of gender equality and social inclusion, observing human rights and the principles of social mobility, eliminating excessive inequality of income and wealth. The fifth Sustainable Development Goal comprises human health and well-being, health care at all stages of life, primary health care services, the right to reproductive health, reducing child and maternal mortality, extending life expectancy, combating disease, healthy food, physical activity, and social aid. The sixth goal of sustainable development is to improve agricultural systems, increase rural productivity, rural infrastructure, and access to food production resources, ensure climate resilience, the sustainability of agriculture, sustainability in the food supply, protect water reserves, land, livestock, fisheries, and overall biodiversity. The seventh objective of sustainable development is to limit climate change, ensure sustainable energy, limit the emission of greenhouse gases and effects, move to the decarbonization of the energy system, including the availability of energy services to all. The ninth objective of sustainable development requires the empowerment of inclusive, productive and disputed cities based on inclusive, economically productive and environmentally sustainable elements of climate-resilient development and inequitable transformations in development. The ninth objective of sustainable development incorporates the provision of ecosystems and biodiversity services, good management of water and other natural resources, changes of marine and terrestrial ecosystems of local, regional and global importance in the direction of inclusive economic and human development. (Ristic & Ristic, 2012)

Finally, the tenth objective of sustainable development implies the transformation of governance in the public sector, multinationals, local governments and "business pitches" to ensure transparency, accountability, participation and international rules in finance, corporate reporting trade, new technologies, intellectual property and elimination of corruption. (Doberman & Nelson, 2013)

2 FINANCIAL INCENTIVES – OVERVIEW AND EXPERIENCE OF EUROPE, CHALLENGES OF REGIONAL ADJUSTMENT

In the following pages, a historical overview of European experiences in the field of financial incentives will be presented. The recommendations impose a sufficient challenge on developing countries and on the road to adaptation on the accession path.

Subsidies: In Italy, subsidies are given for the production capacities in less developed regions for crafts and small industrial enterprises in up to 35-50% of total investments, for medium-sized enterprises 15-30% and for large enterprises 7-12%. For all businesses, this subsidy is increased by a fresh 10% for expenditures on machinery and equipment produced in the South and for the purchase of pollution prevention installations and equipment. In France, there are premiums for regional development of 12-15% of the invested funds, to offset costs of relocation of companies from the Paris region and up to 60% of costs, to offset costs of training experts, moving and housing workers, to assist local authorities when buying or preparing land up to 25% of the value of investments and for the purchase, construction and equipping of industrial buildings. In Germany, public financing is related to the formation or expansion of industrial enterprises in up to 10-25% of the value of an investment in new capacity and 15% of the expansion of existing capacity. In Denmark, subsidies are up to 25% of the value of investments. In Belgium, subsidies are granted in the case where investments are financed from own funds, in the amount of interest rate credit given in the case of credit financing. Interest bonuses or subsidies in equity may be replaced by "employment premiums" for a period of five years. Great Britain also provides subsidies for the acquisition of new investment equipment of up to 22% and premiums for any additional employment. In Ireland, subsidies go up to 40% of the value of investments in certain and up to 25% in other underdeveloped areas. For the modernization and reconstruction of existing capacities, subsidies amount up to 35% or up to 25%, while for scientific and research work subsidies can go up to 50%. In Luxembourg, subsidies are granted only if the project is financed by non-loan funds, up to a maximum of 15% of the investment value. In Sweden, the government stimulates employment in undeveloped areas through premiums, which are given to every individual who moves out of the so-called development center, and through traffic privileges. (Ristic & Ristic, 2012)

When it comes to grants, there are grants in Italy in the amount of construction costs, grants of 10% for purchased equipment and appliances in developed areas, and 20% for purchased equipment in underdeveloped areas. In Germany, the Fund for Regional Development Programs in Industry and Tourism grants an amount of 15% of investments, or up to 25% to reduce investment costs in border areas. In France, funding for the development of underdeveloped areas comes from the Territorial Development Fund, the Economic and Social Development Fund, and the local Regional Development Fund in the form of grants, subsidies and soft loans. In the United Kingdom, special grants are approved for the construction of special facilities to increase employment, grants for expenses related to the relocation of businesses and workers to undeveloped areas, and for the education of personnel and retraining of workers, construction grants, special purpose grants of up to 85% of the cleaning costs for neglected and polluted areas, special grants of up to 30% of infrastructure improvement costs and grants of up to 30% of wage costs in start-ups.

Interest bonuses are used in Belgium, Luxembourg, and Italy. In Belgium, companies investing in development zones receive bonuses on credits, loans, and liabilities. In Luxembourg, the bonus is granted on investment financing loans for industrial appliances, buildings, research, and human resources. In Italy, interest bonuses are provided to the industrial companies located in the south on the basis of investments in new capacities and modernization and reconstruction of existing installations in the amount of 30-50%. In the Netherlands, the interest bonus is 3% over 15 years. In Germany, loans are given on more favorable terms of up to 50% of investment expenditures. (Ristic K. , 2017)

Fiscal benefits in Italy are approved for tax cuts on a portion of the profits reinvested in the South. The cuts are also applied to taxes on construction material, taxes on the purchase and transfer of

land and buildings, electricity taxes and registration fees for new companies. In Belgium, there is an exemption from local labor and installed energy power tax, company registration, and real estate tax, as well as a reduction in the tax on reinvested profits. In France, there are cuts on land taxes and on reinvested profits and exemption from patent and inheritance taxes. In all EU Member States, there is rapid depreciation. In Italy, there is even double depreciation over three budget years, while in France there is an "exception" of depreciation up to 25% of construction costs. In the UK, initial write-offs are allowed up to 40% of the value of investments, while investments in the most underdeveloped regions enjoy the full benefit of accelerated write-offs. The state grants special privileges in the form of free rent of factories or preferential lease of a newly built factory.

In Germany, grants and subsidies are allocated from public funds between 10% and 25% depending on the identified development segments. In Denmark, investment premiums are up to 25%. In Germany, public aid is given in the form of loans to small and medium-sized enterprises, eligible loans to the manufacturing industry, investments in infrastructure and special benefits from social security funds. In the UK, local government funding is a source of public assistance to industry in underdeveloped regions, with the government prioritizing budgetary procurement from underdeveloped areas.

In addition to direct investment incentives, there are also state or local contributions to businesses in underdeveloped areas. In France, this share of the state is up to 35% of the company's capital. The government of Italy even founded a special body CASMEZ - Cassa del mezzogiorno (Eng. Fund for the South) (SIUSA, 2016), which participated in the capital of the company. In addition, Cassa del mezzogiorno (Felice & Lepore, 2016) approved subsidies of up to 50% of the invested funds for the construction of industrial annexes, to those companies in the regions of the south for the construction of transport and port facilities, and land management, etc. In the UK, the state co-finances the cost of building new industrial facilities and the acquisition of new investment equipment. The share in the cost of construction, purchase, and renovation of industrial buildings is up to 20%, and the share in the cost of facilities relocation is up to 80%.

Tax incentives for equity investments are used in Argentina, Austria, Belgium, Denmark, Finland, France, Greece, the Netherlands, Indonesia, Italy, Japan, Canada, Ireland, Kenya, Luxembourg, Mexico, Germany, Portugal, Singapore, USA, Spain, Switzerland, Sweden, Finland, the United Kingdom, Guinea, Malaysia, Iran, the Philippines, Botswana, Bolivia. Profit tax incentives are used in Brazil, India, Chile, Greece, Honduras, Indonesia, Israel, Italy, China, Colombia, Morocco, Nigeria, Pakistan, Paraguay, Peru, Sri Lanka, Thailand, and Venezuela. Production tax incentives are used in Indonesia, China, Germany, Greece, Spain, Thailand, Uruguay, and the Philippines. Tax incentives on investment in labor are used in Mexico and Israel. Free trade zones are practiced in Brazil, the Philippines, Panama, China, South Africa and Paraguay. Consumption incentives are used in Belgium, Denmark, Finland, France, Greece, the Netherlands, Ireland, Italy, Canada, Spain, and Sweden. Other incentives (subsidized loans, subsidized land lease for industrial enterprises, provision of basic industrial infrastructure, preferential tariffs for utilities, preferential prices under contracts for deliveries to the state, state guarantees on loans to enterprises, technical assistance from state institutions for project development and supervision training, exemption from import duties on equipment, partial duty refund, preferential treatment of foreign joint venture partners, selective loans, beneficial cross-border lending, exemption from agricultural taxes in handicapped areas and exemptions from profit tax to the benefit of industrial and commercial enterprises in border areas) in Austria, Belgium, Brazil, Denmark, the Philippines, France, Finland, Greece, Ireland, Italy, Japan, Morocco, Peru, Spain, Sweden, Tanzania, Uruguay, Ecuador, Indonesia, Guatemala, Colombia, and Thailand.

The emphasis on stimulating additional investment in fixed assets, delivering goods and providing services required by the state and other fiscal and non-fiscal incentives in the policy of reducing regional disparities reflects a focus on supply rather than demand. However, what is the cost of an incentive for the national fiscal body and what are the alternative methods, which, in addition to the cost of incentive, reject the

maximum benefits for the regional economy and national fiscal body by giving equivalent incentives are questions that leave no scientific answers? A standard analysis of price comparisons between the incentive given from fiscal and budgetary resources and the benefits of allocated incentives through production, employment, income, and taxes can demonstrate a rational incentive size in terms of the effectiveness of narrowing regional disparities and the efficiency of allocated resources. In this context, development policymakers should ensure that for each budget expenditure for a fiscal stimulus given, additional revenue for the national fiscal body should be made for income, personal income, consumption, revenue, and assets.

During the period 1980-2005, discussions were held in the EU on the reform of regional development policy and the Regional Development Fund, which was formed as an instrument that, through additional funding, reduces the disparities between the national economies of the Member States, prioritizing the development of the least-favored regions and coordination of national regional policies. The Fund's Regional Development Incentives policy was supported from four sources: (1) Beneficiary loans granted by the European Investment Banks, (2) aid from the Agrarian Fund, (3) additional funding from the Social Fund and (4) funds from the Regional Development Fund. In the period 1985-2008, a huge sum was raised through the Fund for the EU, to activate investments in which the Fund participated with 13-17%. So far, there have been disputes over the functioning of the Fund over the question of who contributes and to what extent, and who benefits and in what amount, primarily because the Fund financed the budgets of countries allocated to regional development and that the fund's grants were a form of subsidy to the budgets of EU Member States. As a result, the Fund's reformulated strategy allocates funds into two categories: (1) funds allocated to the Member States within fiscal quotas and allocated according to the national regional development programs, and (2) funds used to finance joint projects. In this way, the Fund is not only an instrument of fundraising and allocation, but it also decides on the use of funds and coordinates national regional development policies with EU policy in order to arrive at a single, common regional development policy. (Ristic K. , 2017)

Fiscal incentives and benefits stimulate investment in research and the "production" of highly skilled personnel. Specific fiscal incentives stimulate rationalization and innovation. Imports of scientific research equipment are, as a rule, exempt from import duties (sales and customs taxes). Investments in human resources and the production of educational services, in essence, have the treatment of investments in "human capital" with a high yield rate for “investors“ through increasing the newly created value and social productivity of labor. Realized results of scientific and research work in technical and technological progress repeatedly influence production. Therefore, science and education have lost their treatment of consumer goods and have acquired the status of indirectly manufacturing activities.

As activities of particular social interest and a leading activity within the entire sphere of social activities, educational and scientific needs are supported by fiscal resources. However, additional investment in science and education does not have fiscal treatment. Namely, investments in scientific and educational activities that are treated as material costs, covered by the reserve funds, are not fiscally treated. The same is the case with additional investments of the company with additional appropriations from income, earmarked investments, pooling of the funds, etc. Citizens' contribution to science and education is a deductible item in determining the fiscal burden of taxes on citizens' total income. Finally, the employment fund increases the mobility of highly skilled staff, with special staff gains attracting professional staff for underdeveloped areas.

3 MACROECONOMIC POLICY OF THE EU AND SUSTAINABLE DEVELOPMENT: CRITICAL OBSERVATIONS, CHALLENGES OF THE REGIONAL ADAPTATION

In this context, global hawks seek to establish comprehensive control over citizens, natural resources and capital in the form of democratic regulation of planetary flows and transnational affairs (interests). Such a global trend is

accompanied by a dangerous gap between the forced "end of the nation-state" and the megalomaniac aspirations for the "proliferation of weak states" in the absence of effective global democratic institutions. Is it "globalization under a human disguise" and what remains of the "sustainable development" theory, which propagates an environmentally tolerable social, just and efficient economy? The globalist view of the world is linked to the privatization of state-owned (public) enterprises, an increase in the role of the private sector, a decrease in state interference in economic flows (deregulation), an increase in the freedom of flow of finances and foreign investment. Globalization is, therefore, a new starting point for the behavior of transnational corporations, changes in production and distribution technology, economies of scale, consumer behavior, liberalization of foreign trade and capital flows, widening the boundaries to locate businesses and ignoring the importance of a sustainable development economy. The pursuit of wealth leads to totalitarianism as wealth becomes new aggression. The point is that the economy must be spiritualized because the poor must be protected. The ethical issue is a more equal distribution of wealth, not just economic or social (though money has already become a religion). Globalism must not flourish by economic doctrines alone, as a "use of man" policy might take the stage. Then, indeed, Ethics and Nature would be replaced by Politics and Profit, which would push people into the bondage of a plastic thought, and not of sustainable development. In a financial vortex, global capitalism has introduced the anarchy of corporate dictatorships with the accelerated economic collapse of the entire world. The perverse connection between democracy and debt slavery is a direct consequence of the so-called "scum of the economy" (Napoleoni, 2008), which rules both life and death around the world. The Nobel-like raising a scientific attention that the economy should go in the direction of services and that ownership structure is a fundamental determinant of profitability has made it a bad practice for non-investment in a country to slip into crime, which is also a target function of the so-called corporate direct investment in the pills of structural adjustment, competitiveness, liberalization, privatization, and deregulation, as well as the destructive exploitation of cheap raw materials and unscrupulous increase in unemployment, pushing sustainable development on the path of global humanity. Europe wrongly strives to retain an advantage in the global economy by constantly reducing social security benefits and permanently increasing freedom for the owner of the capital. It is wrong to salvage financially devastated banks and companies by the means of the funds raised from the citizens' tax to the detriment of the science, education, health, and social protection, which are the epicenter point of sustainable development. (Marković, 2010)

Privatization, deregulation, liberalization, competition and innovation are all deregulators of institutional barriers to economic development and human well-being, with the development of the "tragedy of shared property" and "problematic state interventionism." State sovereignty is willingly surrendered to the global market, which improves efficiency and productivity, decreases prices and controls inflationary tendencies. Neoliberalism is suspicious of democracy and the law of the majority (which attacks the rights of individuals) and favors governance by the experts and the corporate elite (to isolate superfluous institutions such as the central bank). Neoliberal state, as a rule, favors the integrity of the financial system and the solvency of financial institutions. Neoliberalism lowers wages, increases worker exploitation increases job insecurity and eliminates protection at work. Social security has been minimized to the benefit of personal accountability and the strengthening of public-private partnerships. The state assumes a larger portion of the risk, while the private sector takes the larger portion of the profits. State coercion enhances the protection of corporate capital interests. Neoliberalism does not treat the nation with benevolence, and the liberal state, as a factor of competitiveness in the global market, mobilizes nationalism in promoting the business climate of the entrepreneurial spirit with emphasized individual freedoms and negation of sustainable development. (Stiglitz, 2015)

The collapse of the financial bubble, expressed through distorted asset prices, through the fleeing of the workforce, through the capital flight and through internal bankruptcies, has led to severe depression, which has crippled economic growth, lowered consumption and doubled unemployment. Economic ideas have, through

international convergence, established a neo-liberal program based on reducing the fiscal deficit, balancing the budget and controlling inflation, bypassing full employment and fair income distribution. Thus, the EU's neoliberal agenda became the cornerstone of macroeconomic policy, which relied on increasing autonomy, the cohesion of small and medium-sized enterprises, changing conditions for lending, lobbying, bribery, corruption, and election involvement. However, neo-liberalism could not function without the universal tendency to increase social inequality and growing marginalization without hiding the harsh reality of the rise of class power in the major financial centers of global capitalism, which is ravaging a sustainable development economy. In a wave of structural adjustment and neoliberal reforms, citizens are forced to live as market pendants. Stiglitz and Krugman, in favor of reforming global governance with better regular structures and tighter control over the financial system, have sharply pointed to the problem of income and asset inequality, which generate a structural crisis and degenerate structural reforms. Yet both global jobless and stagnant global economic recovery boils down to continued growth in debt-fuelled consumerism, as the US economy continues to rely on a huge amount of credit to maintain its wasteful functioning. So, what is “transitional” on the path to a perfect neoliberal world has already been recognized as the wrong utopian rhetoric of neoliberalism. The ideals of the neoliberal economy are already articulating a desire for alternative social relations. It does not subvert all human activities into the realm of markets but directs them towards sustainable development with sustainable finances and social inclusion. (Ristic K. , 2017)

4 CONCLUSIONS

The global economic crisis together with the implementation of the neoliberal project revealed the shift of the focus of the global economy from manufacturing to the finance sector as if economic activity no longer mattered. Thus, primitive private freedom has been formalized to gain profit from poverty in the form of a secretly designed private advantage such as competition, as a key impetus for development and a generator of monopoly. The presented analysis in the paper reinstates the state intervention in the form of European experience as a massive challenge for all countries in the accession process and with the aim of achieving regional economic equality. In this context, the final conclusion would be based on the statement that special financial and fiscal exemptions and incentives stimulate additional allocations for infrastructure needs. Economic transfers support investment in infrastructure. By issuing internal public debt and importing foreign accumulation by external borrowing creditworthy resources are recruited to finance regional cohesion and development, and finally, under eligible lending conditions, funds are reallocated into investment ventures in the area of infrastructure integrated regional sustainable development strategy. Based on the conclusions drawn, an additional one is that the local and executive levels ought to initiate sustainable regional development and cohesion.

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Received for publication: 24.11.2019
Revision received: 06.01.2020
Accepted for publication: 10.01.2020

How to cite this article?

Style – **APA** *Sixth Edition:*

Ristic, K., Pantovic, S., Gagovic, Z., & Brckalo, M. (2020, January 15). Financial focusing on economic development sustainability. (Z. Cekerevac, Ed.) *MEST Journal, 8*(1), 93-100. doi:10.12709/mest.08.08.01.11

Style – **Chicago** *Sixteenth Edition:*

Ristic, Kristijan, Stanislav Pantovic, Zeljka Gagovic, and Marko Brckalo. 2020. "Financial focusing on economic development sustainability." Edited by Zoran Cekerevac. *MEST Journal* (MESTE) 8 (1): 93-100. doi:10.12709/mest.08.08.01.11.

Style – **GOST** *Name Sort:*

Ristic Kristijan [et al.] Financial focusing on economic development sustainability [Journal] // MEST Journal / ed. Cekerevac Zoran. - Belgrade – Toronto : MESTE, January 15, 2020. - 1 : Vol. 8. - pp. 93-100.

Style – **Harvard** *Anglia:*

Ristic, K., Pantovic, S., Gagovic, Z. & Brckalo, M., 2020. Financial focusing on economic development sustainability. *MEST Journal,* 15 January, 8(1), pp. 93-100.

Style – **ISO 690** *Numerical Reference:*

Financial focusing on economic development sustainability. **Ristic, Kristijan, et al.** [ed.] Zoran Cekerevac. 1, Belgrade – Toronto : MESTE, January 15, 2020, MEST Journal, Vol. 8, pp. 93-100.

MEST Journal
DOI 10.12709/mest.08.08.01.12

JURISDICTION OVER WAR CRIMES

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JEL Category: **Y90**

Abstract

The article deals with jurisdiction over war crimes. It quotes cases in domestic and international courts, as well as at the Statute of the International Criminal Court (ICC). The notion of the statute of limitations and the principle of universal jurisdiction are also exposed to examples. Especially as far as the jurisdiction of the International Court of Justice is concerned. State responsibility and individual responsibility for war crimes will be presented in relation to the universal jurisdiction. The ICTY and the ICTR case law will be shown in relation to the definition of the war crimes and violation of the ICL (International Customary Law). The introduction of three new war crimes by the Resolution ICC-ASP/16/Res.4, adopted at the 12th plenary meeting, on 14 December 2017, by consensus, as amendments to article 8 of the Rome Statute of the International Criminal Court, will be presented with the explanation.

Keywords: *universal jurisdiction, state responsibility, the definition of war crimes, individual responsibility, ICL (international customary law).*

1 INTRODUCTION

According to ICL codification, rule 157" *States have the right to vest universal jurisdiction in their national courts over war crimes*".

Generally, criminal law of a State applies to crimes committed on its territory or by its own nationals, but States are passing laws that allow their courts to prosecute crimes committed outside their territory. This is the principle of the universal jurisdiction which enables States to prosecute any person who has committed a grave breach of IHL, irrespective of his nationality and the place where the crime was committed. This is the rule established by the State practice as a norm of customary international law with respect to war crimes committed in both international and non-international armed conflicts. (Hovell, D., 2018) (Kluven, T., 2017). It is worth to remember what Professor Theodor Meron, the world's most important author on issues of international humanitarian law said already in 1998 about the universal jurisdiction: "There is, of course, a synergistic relationship among the statutes of the international criminal tribunals, the jurisprudence of the Hague Tribunal, the growth of customary law, its acceptance by states, and their readiness to prosecute offenders under the principle of universality of jurisdiction". (Meron, Th., 1998)

National legislation, as well as treaty law, support the right of States to vest universal jurisdiction in their national courts for war crimes. The Second Protocol to the Hague Convention of 1954 for the Protection of Cultural Property in the event of armed conflict from 26 March 1999, in article 16(2)(a) states that: "2. With respect to the exercise of jurisdiction and without prejudice to Article 28 of the Convention: a. this Protocol does

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not preclude the incurring of individual criminal responsibility or the exercise of jurisdiction under national and international law that may be applicable, or affect the exercise of jurisdiction under customary international law". It was interpreted as expressing the right of States for the universal jurisdiction in their national courts for war crimes. (Henckaerts, J-M., 1999) The Genocide Convention of 9 December 1948, in art. VI says:" Persons charged with genocide or any of the other acts enumerated in article III shall be tried by a competent tribunal of the State in the territory of which the act was committed, or by such international penal tribunal as may have jurisdiction with respect to those Contracting Parties which shall have accepted its jurisdiction „. This article refers to territorial jurisdiction but was interpreted as not prohibiting the application of the principle of universal jurisdiction to genocide. (UNTS, 1951) The Statute of the International Criminal Court does not oblige States to establish universal jurisdiction over the war crimes it lists, but many States have incorporated the list of war crimes contained in the Statute in their national legislation and vested jurisdiction in their courts to prosecute persons suspected of having committed such war crimes on the basis of the principle of universal jurisdiction. [1]

The International Court of Justice in the judgment of 14 February 2002, [2] focused on the immunity of heads of State and of ministers of foreign affairs. In this case, the Democratic Republic of the Congo challenged the arrest warrant issued by a Belgian judge against the Congolese Minister of Foreign Affairs. DRC argued, that the indicted person needed to be in the territory of the State exercising such jurisdiction. The ICJ did not rule on the issue of universal jurisdiction as such because Belgium had referred to the non-ultra petita principle. However, judges of the Court in their separate and dissenting opinions and declarations expressed their views on the universal jurisdiction. As far as universal jurisdiction in absentia for war crimes and crimes against humanity was concerned, except for the question of possible immunities, five of the judges in their separate or dissenting opinions were in favor of the right of States to prosecute persons, even if they were not present on their territory. Four other judges expressed their opinion that a right of States to exercise such a universal jurisdiction without any territorial link did not exist yet. In his separate opinion, President Guillaume stated that "universal jurisdiction in absentia is unknown to international conventional law" and that the same would be true for international customary law. In his declaration, Judge Ranjeva stated that even if the text of the judgment left the question open, in his opinion the law did not permit the exercise of universal jurisdiction in the absence of a territorial or personal active or passive connection. But he stated that: „Without any doubt, the evolution in the contemporary world of political ideas and conditions were favorable to the weakening of the territorial approach to the jurisdiction and to the emergence of a more functional approach in the meaning of serving a superior common goal". In his separate opinion, Judge Rezek stated that universal jurisdiction without any territorial link was not authorized by today's international law. He stated that there would be no customary law "information" deriving from the isolated action of one State. Judge ad hoc Bula-Bula was of the same opinion and said, that Article 129, second paragraph, of the 1949 Geneva Convention III did not envisage jurisdiction in absentia. In his dissenting opinion, Judge Oda stated: „It is one fundamental principle that a State cannot exercise its jurisdiction outside its territory. However, the past few decades have seen a gradual widening in the scope of the jurisdiction to prescribe law … The scope of extraterritorial criminal jurisdiction has been expanded over the past few decades … Belgium is known for taking the lead in this field and its [Law concerning the Repression of Grave Breaches of the Geneva Conventions and their Additional Protocols as amended (1993)] may well be at the forefront of a trend. There are some national case law and some treaty-made law evidencing such a trend". He also added, that "the law is not sufficiently developed". In their joint separate opinion, Judges Higgins, Kooijmans and Buergenthal stated: „There are … certain indications that a universal criminal jurisdiction for certain international crimes is clearly not regarded as unlawful. The duty to prosecute under those treaties which contain the aut dedere aut prosequi

[1] For example Belgium, Canada, Germany legislations.

[2] www.icj-cij.org/files/case, DRC v Belgium; see separate opinion of judge Bula-Bula

provisions opens the door to a jurisdiction based on the heinous nature of the crime rather than on links of territoriality or nationality (whether as perpetrator or victim). The 1949 Geneva Conventions lend support to this possibility, and are widely regarded today as reflecting customary international law". These judges also found that the PCIJ judgment in the Lotus case from 1927 [3], supported the lawfulness of the exercise of universal jurisdiction in absentia. However, they found that it was necessary that "universal criminal jurisdiction be exercised only over those crimes regarded as the most heinous by the international community". Besides piracy, "war crimes … may be added to the list". Judge Koroma, in his separate opinion, stated that "In my considered opinion, today, together with piracy, universal jurisdiction is available for certain crimes, such as war crimes and crimes against humanity, including the slave trade and genocide." Judge ad hoc Van den Wyngaert stated in her dissenting opinion: "It follows from the "Lotus" case that a State has the right to provide extraterritorial jurisdiction on its territory unless there is a prohibition under international law." She stated that neither conventional nor customary law prohibited the exercise of universal jurisdiction in absentia and concluded: „International law clearly permits universal jurisdiction for war crimes and crimes against humanity… For crimes against humanity, there is no clear treaty provision on the subject but it is accepted that, at least in the case of genocide, States are entitled to assert extraterritorial jurisdiction. In the case of war crimes, however, there is specific conventional international law in support of the proposition that States are entitled to assert jurisdiction over acts committed abroad: the relevant provision is Article 146 [of the 1949 Geneva Convention IV], which lays down the principle aut dedere aut judicare for war crimes committed against civilians".

Unfortunately, I disagree with the justification of the ICJ as far as considering a war crime as an act always committed in private capacity and I accept totally the view of Prof. M. Spinedi, that: „ In my view, treating a war crime or a crime against humanity as an act that is, by its nature, always committed in a private capacity is not only wrong per se, but would constitute a remedy more harmful than the wrong it was intended to remedy". (Spinedi, M., 2002; Cassese, A., 2002; S Wirth, S., 2002)

In addition to the Geneva Conventions and Additional Protocol I, there are many different Conventions which oblige States, parties to these Conventions to provide for universal jurisdiction over certain crimes, including when they take place during armed conflict. For example: the Convention against Torture, the Inter-American Convention on Forced Disappearances, the Convention on the Safety of UN Personnel and the Second Protocol to the Hague Convention for the Protection of Cultural Property. We can conclude, that international law permits universal jurisdiction for war crimes and crimes against humanity.

2 NATIONAL CRIMINAL JURISDICTION.

Article 1 of the ICC, the Rome Statute stated that:" An International Criminal Court is hereby established. It [...] shall be complementary to national criminal jurisdictions". It means that where the state is unwilling or unable to prosecute international crimes, the ICC based on the complementarity principle, may prosecute persons responsible for the commission of the crimes under its jurisdiction, such as genocide, crimes against humanity, war crimes, and the crime of aggression. Domestic courts will be mainly responsible for prosecuting persons responsible for international crimes and the ICC should be regarded as a *last resort. However, it can be difficult and complicated in practice because m*any states still do not have the right legislation in place to prosecute international crimes on a domestic level and even those that have, they meet many obstacles and limitations to prosecute such crimes. It happens for example when a state has not incorporated the international crimes into its domestic law or does not provide for universal jurisdiction. When a state does have a basis to prosecute international crimes, these cases are often complex and there are difficulties to obtain evidence from the respective states. Many states do not have specialized war crimes units in their tribunals like

[3] S.S. Lotus case (France v Turkey), PCIJ, series A, no10, 1927

Germany, France, and the Netherlands for example have. They offer great support for the war crimes investigation. Sometimes there is a lack of political will to prosecute international crimes.

Domestic courts can exercise jurisdiction over international crimes based on the principle of *universal jurisdiction*. This principle is based on the notion that any state may exercise jurisdiction over a situation involving crimes considered "*to be of extreme gravity and concern the international community*." The ICC in its Statute, obliged member states to amend their domestic legislation to be able to prosecute international crimes. The ICC can intervene and has jurisdiction based on the *principle of complementarity*, only over cases where states are unwilling or unable to take action.

Universal jurisdiction is the most used form of jurisdiction for international crimes. There are other forms of jurisdiction that provide domestic courts with the power to prosecute international crimes, especially those not falling under the Rome Statute. The *territoriality principle* permits jurisdiction based on where the crime took place. Domestic courts can use this type for example in cases of terrorist attacks if they have been committed to the state's territory. The *active personality principle* permits jurisdiction based on the nationality of the perpetrator, so when the perpetrator is a national of a state, that state may prosecute him or her. The *passive personality principle* allows for a state to claim jurisdiction based on the nationality of the victim. The *protective principle* bases jurisdiction over a person on the protection of national interests or security even when the person is outside the state's boundaries.

2.1 In international courts.

A. International Criminal Tribunals for the former Yugoslavia and Rwanda.

The cornerstone for the prosecution of individuals for violations of the laws of war, after WWII, was the establishment of the International Criminal Tribunal for the Former Yugoslavia (ICTY), and of the International Criminal Tribunal for Rwanda (ICTR). They were created as ad hoc tribunals by the United Nations Security Council and based on Chapter VII and Art. 25 UN Charter. (Meron, Th., 1999)

The Statute of the ICTY, restricted to the former Yugoslavia, did not use the term 'war crimes' but included two categories of them: Art. 2 ICTY Statute penalizes 'grave breaches of the Geneva Conventions against persons or property protected under the provisions of the relevant Geneva Convention' committed in an international armed conflict; Art. 3 ICTY Statute penalizes 'violations of the laws or customs of war', amended by an illustrative list that contains elements of the Hague Rules of Land and Warfare as well as certain provisions of Additional Protocol I of the Geneva Conventions. Art. 3 ICTY Statute, as interpreted by the Tribunal, serves as a 'general provision covering all violations of humanitarian law' not qualified as grave breaches, acts of genocide, or crimes against humanity regardless of whether the violation occurs within the context of an international or non-international armed conflict[4]. In the Tadić Case, the Appeals Chamber ultimately concluded that 'all of these factors confirm that customary international law imposes criminal liability for serious violations of Common Article 3, as supplemented by other general principles and rules of the protection of victims of internal armed conflict, and for breaching certain fundamental principles and rules regarding means and methods of combat in civil strife'. [5]

The Statute of the ICTR covers war crimes committed in a non-international armed conflict. Art. 4 ICTR Statute includes 'violations of Article 3 common to the Geneva Conventions and of Additional Protocol II' (Geneva Conventions Additional Protocol II [1977]). In its first judgment in the Akayesu Case, the ICTR adopted the view of the Appeals Chamber in the *Tadić Case* and concluded that 'the violation of these norms entail, as a matter of customary international law individual responsibility for the perpetrator.' [6]

The jurisprudence of the ICTY and the ICTR influenced the negotiations for the creation of the ICC and for the extension of its over war crimes committed in non-international armed conflicts, and the adoption of a substantive list of war crimes committed in non-international armed conflicts into

[4] Op.cit. paras 128–37, 134
[5] Op.cit. paras 128–37, 134
[6] Prosecutor v Akayesu, Judgment, ICTR-96-4-T, 2 September 1998, para 616.

Art. 8 ICC Statute. The ICC Statute is, after the ICTR Statute, the second international instrument that explicitly recognized the criminal liability of individuals for war crimes committed in non-international armed conflicts.

The Security Council adopted Resolution 1966 (2010) in which it established the Mechanism for International Criminal Tribunals (Mechanism or MICT) as a subsidiary organ of the Council with the mandate to continue the jurisdiction, rights and obligations, and essential functions of the ICTR and ICTY. The Mechanism is composed of two branches: one in Arusha, for matters arising from ICTR cases, and one in The Hague, for matters arising from ICTY cases. the Arusha branch commenced functioning on July 1, 2012, and The Hague branch began its operations on July 1, 2013.

B. *War crimes under the ICC Statute*

Art. 8 ICC Statute, with an enumeration of 51 war crimes, is currently the most comprehensive provision in international treaty law regulating the law of war crimes. (Klamberg, M., 2017) The codification takes into account recent developments by customary international law as well as case law from previous international criminal tribunals such as the ICTY and the ICTR. This is reflected in the fact that the Rome Statute for the first time provides an explicit codification of war crimes committed in non- international armed conflicts which led to a considerable extension of the notion of war crimes. Such new war crimes was codified in the Rome Statute, as the recruitment of child soldiers (Arts 8 (2) (b) (xxvii), 8 (2) (e) (vii) ICC Statute) and attacks on peacekeepers (Art. 8 (2) (e)(iii) ICC Statute). The Statute also codified the gender-based crimes and sexually violent crimes, such as 'rape, sexual slavery, enforced prostitution, forced pregnancy, enforced sterilization or any other form of sexual violence also constituting a grave breach of the Geneva Conventions' (Art. 8 (2) (b) (xxii)). (Dixon, R., 2002; Meron, Th., 1993)

The structure of Art. 8 ICC Statute classifies war crimes into four main categories: two of them are applicable to international armed conflict and two to non-international armed conflict. War crimes applicable to international armed conflict are regulated in Art. 8 (2) (a) ICC Statute, which criminalizes 'grave breaches of the Geneva Conventions of 12 August 1949' and in Art. 8 (2) (b) ICC Statute criminalizing 'other serious violations of the laws and customs applicable in international armed conflict'. War crimes applicable to non-international armed conflict are regulated in Art. 8 (2) (c) ICC Statute, which criminalizes 'serious violations of Article 3 common to the four Geneva Conventions of 12 August 1949', and in Art. 8 (2) (e) ICC Statute criminalizing 'other serious violations of the laws and customs applicable in armed conflicts not of an international character' primarily based on the Hague Regulations of 1907 and Additional Protocol II to the Geneva Conventions of 1977. The Rome Statute defines war crimes by reference to the nature of conflict as well as by reference to their humanitarian law source.

In contrast to customary international law as well as the statutes of the ICTY and the ICTR, the ICC provides a particular contextual element for war crimes. Art. 8 (1) ICC Statute determines that the ICC 'shall have jurisdiction in respect of war crimes in particular when committed as part of a plan or policy or as part of a large-scale commission of such crimes.' and 'the statutory requirement of either large-scale commission or part of a policy is not absolute' [7].

Art. 8 ICC Statute includes two different thresholds for the existence of a non- international armed conflict. Art. 8 (2) (d) ICC Statute refers to the 'classical' threshold of common Art. 3 Geneva Conventions, Art. 8 (2) (f) ICC Statute 'applies to armed conflicts that take place in the territory of a State when there is a *protracted* armed conflict between governmental authorities and organized armed groups or between such groups.' Under current international humanitarian law, we can distinguished three different types of non- international armed conflicts: the conflict according to common Art. 3, as applied by Art. 8 (2) (d) ICC Statute (lowest threshold), the conflict according to Art. 8 (2) (f) ICC Statute (medium threshold), and the type of conflict according to Art.1 (2) AP II (highest threshold).

[7] Situation in the Democratic Republic of the Congo, ICC-01/04, Judgment on the Prosecutor's Appeal Against the Decision of Pre-Trial Chamber I, 13 July 2006, para. 70

In the Resolution ICC-ASP/16/Res.4, adopted at the 12th plenary meeting, on 14 December 2017, by consensus, on amendments to article 8 of the Rome Statute of the International Criminal Court, three new war crimes were introduced:

Annex I

Amendment to be inserted as article 8-2-b)xxvii) and article 8-2-e)xvi) of the Rome Statute

Employing weapons, which use microbial or other biological agents, or toxins, whatever their origin or method of production;

Annex II

Amendment to be inserted as article 8-2-b)xxviii) and article 8-2-e)xvii)

Employing weapons the primary effect of which is to injure by fragments which in the human body escape detection by X-rays;

Annex III

Amendment to be inserted as article 8-2-b)xxix) and article 8-2-e)xviii)

Employing laser weapons specifically designed, as their sole combat function or as one of their combat functions, to cause permanent blindness to unenhanced vision, that is to the naked eye or to the eye with corrective eyesight devices;

It is in accordance with article 121, paragraphs 1 and 2, of the Rome Statute of the International Criminal Court which permits the Assembly of States Parties to adopt any proposed amendment to the Rome Statute after the expiry of seven years from the entry into force of the Statute.

These new war crimes are related to the use of prohibited weapons in international as well as non-international armed conflicts. During the discussion, there was controversy regarding the legality of adding these new war crimes to the list of war crimes. One of the concerns was that there would be fragmentation of the Rome Statute system with different crimes applicable in different situations to different individuals. This is because under the amendment procedure to the Rome Statute (Art. 121(5)) these new crimes would not apply to nationals of, or conduct on the territory of, non-ratifying states parties. Another concern was that the new crimes (or at least some of them) are, in the view of some states, not criminalized under customary international law and thus not suitable for addition for inclusion in the ICC Statute.

2.2 Statutes of limitations.

According to ICL, Rule 160. Statutes of limitation may not apply to war crimes. State practice establishes this rule as a norm of customary international law applicable in relation to war crimes committed in both international and non-international armed conflicts.

The non-applicability of statutory limitations to war crimes and crimes against humanity is provided for by the 1968 UN Convention on the Non-Applicability of Statutory Limitations to War Crimes and Crimes against Humanity and by the 1974 European Convention on the Non-Applicability of Statutory Limitations to Crimes against Humanity and War Crimes. [8]

[8] UN Convention on the Non-Applicability of Statutory Limitations to War Crimes and Crimes against Humanity-1968, The preamble recognizes that “it is necessary and timely to affirm in international law, through this Convention, the principle that there is no period of limitation for war crimes and crimes against humanity, and to secure its universal application”.

Article 1 provides: No statutory limitation shall apply to the following crimes, irrespective of the date of their commission:

(a) War crimes as they are defined in the Charter of the International Military Tribunal, Nürnberg, of 8 August 1945 and confirmed by resolutions 3(1) of 13 February 1946 and 95(I) of 11 December 1946 of the General Assembly of the United Nations, particularly the “grave breaches” enumerated in the Geneva Conventions of 12 August 1949 for the protection of war victims;

(b) Crimes against humanity whether committed in time of war or in time of peace as they are defined in the Charter of the International Military Tribunal, Nürnberg, of 8 August 1945 and confirmed by resolutions 3(I) of 13 February 1946 and 95(I) of 11 December 1946 of the General Assembly of the United Nations, eviction by armed attack or occupation and inhuman acts resulting from the policy of apartheid, and the crime of genocide as defined in the 1948 Convention on the Prevention and Punishment of the Crime of Genocide, even if such acts do not constitute a violation of the domestic law of the country in which they were committed.

European Convention on the Non-Applicability of Statutory Limitations to Crimes against Humanity and War Crimes (1974) - Article 1 provides: Each Contracting State undertakes to adopt any necessary measures to secure that statutory limitation shall not apply to the prosecution of the following offences, or to

Between 1969 and 1973, the UN General Assembly adopted several resolutions calling on States to ratify the UN Convention on the Non-Applicability of Statutory Limitations to War Crimes and Crimes against Humanity and, in 1970, welcoming its entry into force. [9]

Article 29 of the 1998 ICC Statute provides: "The crimes within the jurisdiction of the Court shall not be subject to any statute of limitations." This provision was not controversial, because the International Criminal Court has jurisdiction in relation to acts committed after the Statute enters into force. Also, the UNTAET Regulation No. 2000/15 establishes panels with exclusive jurisdiction over serious criminal offenses, including genocide, war crimes, crimes against humanity and torture. Section 17(1) provides that these offenses "shall not be subject to any statute of limitations".

In military manuals of many States, like for example Australia, Italy, the United States, there is a provision that statutes of limitation do not apply to war crimes. Also the legislation of many States such as Argentina, Belgium, Germany, Switzerland, including those not being party to the UN or European Conventions on the Non-Applicability of Statutory Limitations to War Crimes or Crimes against Humanity. The United States in 1986, in the diplomatic note to Iraq, (also not a party to the UN Convention) wrote, that individuals guilty of war crimes could be subject to prosecution at any time, without regard to any statute of limitations. [10] Another official statement in relation to the statute of limitations was a letter sent by Yugoslavia in 1993 to the UN Secretary-General, in which Yugoslavia stated, that war crimes were not subject to statutes of limitation.

In the *Mengistu and Others case* in 1995, the Special Prosecutor of Ethiopia stated that "it is … a well-established custom and belief that war crimes and crimes against humanity are not … barred by limitation".[11] An interesting situation took place in France. France's Penal Code provides for the non-applicability of statutes of limitation for genocide and "other crimes against humanity". In the *Barbie case* in 1985, France's Court of Cassation held that in contrast to crimes against humanity, war crimes committed during the Second World War were subject to the time-limits imposed by statute. [12] But France signed the European Convention on the Non-Applicability of Statutory Limitations to Crimes against Humanity and War Crimes and has ratified the Statute of the International Criminal Court.

Israel's Nazis and Nazi Collaborators (Punishment) Law provides that there shall be no period of limitation for prosecution of war crimes, but this law applies only to war crimes committed by Nazis in the Second World War. But in the

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the enforcement of the sentences imposed for such offences, in so far as they are punishable under its domestic law:

1. the crimes against humanity specified in the Convention on the Prevention and Punishment of the Crime of Genocide adopted on 9 December 1948 by the General Assembly of the United Nations;

2. (a) the violations specified in Article 50 of the 1949 Geneva Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field, Article 51 of the 1949 Geneva Convention for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea, Article 130 of the 1949 Geneva Convention relative to the Treatment of Prisoners of War and Article 147 of the 1949 Geneva Convention relative to the Protection of Civilian Persons in Time of War, (b) any comparable violations of the laws of war having effect at the time when this Convention enters into force and of customs of war existing at that time, which are not already provided for in the above-mentioned provisions of the Geneva Conventions, when the specific violation under consideration is of a particularly grave character by reason either of its factual and intentional elements or of the extent of its foreseeable consequences;

3. any other violation of a rule or custom of international law which may hereafter be established and which the Contracting State concerned considers according to a declaration under Article 6 as being of a comparable nature to those referred to in paragraph 1 or 2 of this article.

Article 2 provides: 1. The present Convention applies to offences committed after its entry into force in respect of the Contracting State concerned.

2. It applies also to offences committed before such entry into force in those cases where the statutory limitation period had not expired at that time.

[9] UN GA, Res.2583 (XXIV), Res.2712 (XXV), Res.2840 (XXVI).

[10] United States, Department of State, Diplomatic Note to Iraq.

[11] Ethiopia, Special Prosecutor's Office, Mengistu and others case

[12] France, Court of Cassation, Barbie case.

official statement, Israel declared, that statutes of limitation do not apply to any war crimes.

Treaty law, the practice of States, internal law, official declarations, the jurisprudence of national courts an

3 CONCLUSION

The issue of war crimes occupies a serious place in the doctrine of international criminal law. Although the war is not permitted by international law as a solution of conflicts, we are witnesses of many regional wars, non-international armed conflicts, in which many peoples including civilians are victims. The jurisprudence of the ICTY and the ICTR created rules and regulations, especially as the recognition of war crimes in non-international armed conflicts is concerned. The creation of the ICC and the catalog of war crimes in art.8 of the ICC Statute is a great achievement, which permits for its amendments in the future, by two-thirds majority required. It allows eventually for including other crimes, as the category of war crimes, and in that way to enrich customary humanitarian law by conventional regulations. Actually, they are 122 member states of the ICC, among them, 70 enacted implementing legislation on a national level. Comparing to 111 Member States in 2010 and 44 implementation of the ICC provisions, it makes a great achievement and progress. The Review Conferences should permit further extension of the war crimes list. We also noticed that the concept of universal jurisdiction is in great development and States in their national legislation include different war crimes.

International law, as well as international criminal law, is created by States and only with their acceptance, will and cooperation, the positive development of IHL is possible. New situations create new solutions, and for example, the idea of the Responsibility to Protect (R2P) in the field of human rights is actually permitting the intervention of the International Community into internal affairs of other countries, the situation that 50 years ago was not possible to imagine in classical international law. With the development of new arms, maybe new crimes will be created, but their use in the field of human rights and IHL should be outlawed.

Another important question is how international courts identify the existence of a rule of customary international law (CIL)? Especially as we examine the „humanization trend" in international law after WWII, it means international humanitarian law (IHL), international human rights law (IHRL) and international criminal law (ICL). (Hakimi, M., 2016; Joyner, D., 2018) The ICRC's study from 2005 on CIL was criticized by some authors, (Wilmshurst, E., & Breau, S., 2007) and although I believe that as Daniel H. Joyner said, that: "the sources of international law are essentially based, even if imperfectly, upon the consent of states to be bound to international legal obligation". (Joyner, D., 2018) I disagree that some obligations in IHL are created without a sound basis in the consent of states to be bound by its rules,

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Received for publication: 19.12.2019
Revision received: 31.12.2019
Accepted for publication: 10.01.2020

How to cite this article?

Style – **APA** *Sixth Edition:*

Salkiewicz-Munnerlyn, E. (2020, January 15). Jurisdiction over war crimes. (Z. Cekerevac, Ed.) *MEST Journal, 8*(1), 101-110. doi:10.12709/mest.08.08.01.12

Style – **Chicago** *Sixteenth Edition:*

Salkiewicz-Munnerlyn, Ewa. 2020. "Jurisdiction over war crimes." Edited by Zoran Cekerevac. *MEST Journal* (MESTE) 8 (1): 101-110. doi:10.12709/mest.08.08.01.12.

Style – **GOST** *Name Sort:*

Salkiewicz-Munnerlyn Ewa Jurisdiction over war crimes [Journal] // MEST Journal / ed. Cekerevac Zoran. - Belgrade – Toronto : MESTE, January 15, 2020. - 1 : Vol. 8. - pp. 101-110.

Style – **Harvard** *Anglia:*

Salkiewicz-Munnerlyn, E., 2020. Jurisdiction over war crimes. *MEST Journal,* 15 January, 8(1), pp. 101-110.

Style – **ISO 690** *Numerical Reference:*

Jurisdiction over war crimes. **Salkiewicz-Munnerlyn, Ewa.** [ed.] Zoran Cekerevac. 1, Belgrade – Toronto : MESTE, January 15, 2020, MEST Journal, Vol. 8, pp. 101-110.

MEST Journal
DOI 10.12709/mest.08.08.01.13

ENVIRONMENTAL MANAGEMENT AS A GUARANTEE OF ENTERPRISE DEVELOPMENT

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JEL Category: **M11, Q56**

Abstract

The features of the regulatory and legal support of an enterprise's environmental management are investigated. In the face of the increasing negative impact on the environment, the need to implement environmental management at enterprises becomes a top priority. Domestic environmental legislation and international organizations require intensive development of a new management tool - environmental audit, which stimulates environmental protection at enterprises. This will result in increased profits, reduced costs, improved product quality and significantly reduced negative environmental impact. The distinctive features of environmental management at national and international levels have been formulated. It is proven that the system of standards in the ecology field is intended to ensure the rational use of natural resources and control of ecological safety not to forget the development of environmental programs for ecologically disadvantaged areas. The implementation of environmental management will reduce the negative impact on the environment; improve the environmental and financial performance of the enterprise; allow to develop standards for products' eco-labeling aimed at creating a single regulatory framework in this field, overcoming trade barriers. The main features and ways of development of environmental management in Ukraine are highlighted.

Keywords: *standards, environmental standards, environmental management, system management, standardization and environmental policies.*

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1 INTRODUCTION

The current stage of development of society as a whole, and as a sphere of business activities, in particular, implies an important task of optimizing the impact of human life on the environment.

Programs are being developed at all levels of government aimed at improving the environmental situation and reducing the negative impact of production on the environment. The ecological situation in Ukraine has long been characterized as critical. Due to structural deformations of the national economy, the most environmentally dangerous industries – raw materials and mining ones – were the most developed. A change in the industry strategy requires a change in the society, specifically in social behavior: development of new concepts of public administration and entrepreneurship, so the imbalance of natural capital use and its reproduction won't lead to large-scale destructive processes that pose a real threat to human health and social development.

In recent decades, new scientific trends have emerged, based on both classical doctrines and the latest ideas about man, society and nature, and their coexistence. One of their areas is environmental management, which offers effective tools for solving current and preventing new ecological and economic problems at production.

In the context of today's extremely difficult environmental situation in Ukraine, the study of environmental management at the enterprise becomes especially important. Environmental pollution by waste and emissions of all types of industrial production and inefficient use of resources at the enterprise increase the relevance of this problem. To prevent environmental degradation, the implementation of environmental policy at the enterprise is made. It will help improve the environment at the macro level and save resources by reducing their costs at the micro-level.

In Ukraine, there is a tendency for enterprises to reluctantly introduce an environmental management system and environmental policy because they are not able to evaluate the positive aspects of the results of such work. In our opinion, the involvement of the enterprise in its environmental policy activities will allow Ukrainian industries to increase the efficiency of environmental protection work, plan environmental measures, control compliance with environmental legislation, and reduce the likelihood of emergencies. In this regard, the application and adherence to the regulatory support of environmental management at the enterprise, even in the absence of public funds, will allow the most effective solution to the issue of environmental pollution, which is beneficial for the state as a whole and the particular enterprise in particular, regardless of the field of operation.

2 THE ESSENCE OF ENVIRONMENTAL MANAGEMENT

The distinctive trait of environmental management is the fact that it involves the development of environmental tasks based on appropriate strategies and programs, as well as their implementation by creating profile structures and monitoring the results at all levels. First of all, this is because environmental problems are of a lasting and global nature and affect the interests of different generations.

According to the international standard ISO 14001, the environmental management system is a part of the general management system, which includes organizational structure, activity planning, distribution of responsibilities, practical work, as well as procedures, processes, and resources for development, implementation, evaluation of the achieved results and improvement of environmental management policy, its goals and objectives (Barkov & Belyayeva, 2006). Therefore, environmental management can be defined as a system where those types of enterprise activities which potentially damage the environment are managed; a type of management, principally focused on the formation and development of environmental law and ecological culture of human life, which is based on socio-economic and socio-psychological motivation to achieve harmony between man and nature.

In the modern sense, environmental management studies the management relations in the enterprise, which ensure its sustainable development, environmental protection, human security, rational use of natural resources and environmental security; aims at the implementation of environmental goals and environmental impact programs, as well as an strategies for the development of society, nature management and conservation. The latter is

determined by the biological and socio-economic characteristics of the enterprise, the strategic goals of society, and allow the organization to survive and achieve their goals in the long term.

The term "environmental management" is interpreted primarily in the following ways: activities of environmental organizations; set of activities, methods, and tools of environmental management company; system of separate natural complexes, which are subjects to special protection (Luk'yanykhin, 2002); part of the overall management system that includes organizational structure, planning, responsibilities, accountability, expertise, methods, procedures, processes, and resources to create, analyze and update environmental policy of an organization.

Environmental Management of the Enterprise is part of a general management system that includes organizational structure, planning, responsibility-sharing, practice, procedures, processes and resources that are required to develop, implement, achieve, review and adjust environmental policy goals (Siebert,1998, p. 101; Soderbaum, 2000, p. 54).

Until recently, politics and ecology were disconnected concepts. In modern politics, a new line of activity has emerged - environmental policy. The legal basis of environmental management is formed by a complex set of national and international instruments that regulate business and environmental protection intending to fulfill three main tasks: protecting and preserving the environment and maintaining its quality (water, air, land) at an adequate level; health care for employees of the enterprise and the local population; regulation of the process of consumption and use of natural resources.

2.1 Legal and regulatory support of environmental management

It should be noted that environmental management at the national level is governed by the State Standards of Ukraine (DSTU). In Ukraine, international standards of the ISO 14000 series were adopted in 1997, and therefore, enterprises are required to comply with them. (Pashkov, Fomin, & Krasnyi, 1997) Thus, according to ISO 14000:2004, they must develop, implement and maintain operational procedures that must identify the potential for catastrophes or emergencies that can affect the environment. In turn, it is impossible to ignore emergencies that business entities are obliged to respond to, in particular, by mitigating the consequences or preventing their negative impact on the environment.

The regulation of environmental management at the international level is carried out using the ISO 14000 standards. The decision to develop ISO 14000 is the result of the Uruguay Round of Multilateral trade negotiations. The main subject of ISO 14000 is the environmental management system (Kupalova & Ul'yanova, 2011, p. 51).

International environmental management standards are aimed at providing companies with elements of an effective Ecology Management System (EMS) that can be combined with other components of the enterprise's overall management system to help achieve environmental policy goals. These standards are voluntary and contain clear practical guidelines.

ISO 14000 defines various aspects of environmental management. It provides practical guidance for companies seeking to improve their environmental performance and improve the environmental situation. ISO 14001:2004 defines the basic criteria for an environmental management system that will qualify for certification. It does not set requirements as to what the environmental performance of enterprises should be but defines the areas of effective environmental management when developing environmental policies. This standard is general and universal because it can be used by any enterprise, regardless of size, scope, and industry (table 1).

According to table 1, at the international level (unlike national) exists a mandatory element of environmental legislation - a specific set of economic instruments that serve the purpose of discouraging manufacturers from carrying out harmful or resource-intensive activities.

The main subject of ISO 14000 is the environmental management system. It helps enterprises fulfill their activities without harmful impact.

Table 1. ***Regulatory support environmental management at the national and international levels***

№	Legal document	Main terms and conditions
At the national level		
1	The Law of Ukraine "Fundamentals of the Legislation of Ukraine on Health Care" from 19.11.1992 №2801-XII	Defines legal, organizational, economic and social principles of health, regulates social relations in this area
2	Forest Code of Ukraine from 21.01.1994 №3852-XII	Regulates legal relations to provide scientifically-based management of forest resources
3	The Law of Ukraine "About Environmental Audit" from 24.06.2004 №1862-IV	Defines the basic legal and organizational principles of environmental auditing and aims to improve the environmental feasibility and effectiveness of business entities
4	Land Code of Ukraine from 15.01.1993 №561-XII	Defines the basic legal principles of land relations, objects, and subjects of land relations, structure, and purpose of land, land use principles
5	The Law of Ukraine "On Air Protection" from 16.10.1992 №2707-XII	Defines the legal and organizational framework and environmental requirements in the protection and use of air
6	Water Code of Ukraine from 06.06.1995 №213/95-BP	Regulates legal relations to scientifically substantiate rational use of water for households and industries; reproduction and protection of water resources
Internationally		
1	ISO 14001	Defines Environmental Management System (EMS), its requirements and recommendations for use. Determines the model of environmental management, basic terms (such as environmental policy, goals and objectives, environmental management, internal audit), the basic requirements for the company's environmental policy, implementation and operation of environmental management
2	ISO 14004	Defines general guidelines on principles, systems, and functioning of EMS
3	ISO 14010	Defines guidelines for environmental auditing: general principles
4	ISO 14011	Defines guidelines for environmental auditing, auditing procedures, auditing environmental management systems
5	ISO 14012	Defines guidelines for environmental auditing, environmental qualification criteria for auditors
6	ISO 14014	Defines "entry-level" of enterprise environmental efficiency: tools of environmental monitoring and evaluation
7	ISO 14020	Defines principles of ecolabeling
8	ISO 14031	Defines manual assessment of the environmental performance of the organization
9	ISO 14040	Defines methodology of "life cycle assessment": evaluating the environmental impacts associated with the products at all stages of its life cycle
10	ISO 14050	Defines Environmental Management. Glossary
11	ISO 14060	Defines manual integration of environmental aspects in standards for products

Documents included in ISO 14000 are divided into three main groups:

- creation and use of environmental management systems;
- environmental monitoring and evaluation instruments;
- product-oriented standards (Maslyukovskaya, 2010).

The key concept of ISO 14000 is the Environmental Management System (EMS) of the enterprise. Therefore, the central document in this series is ISO 14001 - "Environmental management systems – Requirements with guidance for use". The series focuses on the requirement to use the "best available technology", rather than on quantitative parameters and technology. Officially, ISO 14000 standards are voluntary; they do not replace legal requirements. ISO 14000 gives guidance on how to negate the possible wrongful impacts on the environment.

Many documents in this series, implemented in Ukraine, has the term "environmental management" replaced by the term “quality management of environment", sometimes with the term "environmental administration ".

Given the major differences of the terms "environmental administration" and "environmental management", we can offer the following definitions of both of them:

1. "Environmental Administration" - is the work of public authorities and economic agents aimed at the mandatory compliance with environmental legislation and the development and implementation of appropriate goals and programs (Burkov, Novikov, & A.V, 2008, p. 307).
2. "Ecological Management" - a set of voluntary activities of economic entities aimed at implementing their own environmental goals, projects and programs developed based on efficiency and ecological justice. The main objectives and the corresponding criteria to assess their achievements in environmental management are related to the process of continuous improvement and perfection in all aspects of environmentally significant activities of economic entities.

2.2 Environmental certification and its objects

The development of practice in environmental management in Ukraine can solve various environmental problems, or at least start the job. New approaches, innovative ways, and opportunities to overcome existing negative trends in the ecological situation in the manufacturing and territorial levels can be researched.

Environmental management is linked to an already existing wide range of opportunities and tools for practical solving of priority environmental problems. Today, every enterprise has a large number of unused technological, technical and organizational capabilities and means to solve them. Thus, environmental management can play an exceptional role in solving environmental problems in the context of Ukraine's exit from the socio-economic crisis (Luk’yanykhin, 2002, p. 102).

Being international, the standards should not affect the scope of national regulations. On the other hand, the precursor of ISO is the "organizational" approach to product quality (for example, the concept of "total quality management"), according to which the key to achieving quality is to build a proper organizational structure and to share responsibility for the quality of products and services. Japan, Germany, Great Britain, and Sweden are the best when it comes to the implementation of ISO 14000 standards.

In Ukraine, the ISO 14000 standards have been adopted as national in 1997. However, the introduction is happening at a rather slow pace.

Ecological certification can be made mandatory and voluntary. Mandatory national system UkrSEPRO certifies objects, which must meet the requirements of environmental protection legislation, as so to ensure environmental safety and conservation of biological diversity. Voluntary certification may be used on other objects.

These are subject to mandatory environmental certification:

- systems of environmental management that are regulated by international standards developed by the Technical Committee ISO/TC207 «Environmental Management"; products harmful to the environment, including

ozone-depleting substances and products containing them, which are expected to be imported to Ukraine or exported from Ukraine, as well as goods imported into the customs territory of Ukraine; environmentally harmful technologies, including those imported into the customs territory of Ukraine, which are used in industrial and research facilities and experimental enterprises;
- production and consumption waste, including hazardous and other wastes that are subject to transboundary movement; activity in the field of waste management;
- species of animals and plants, their parts or derivatives covered by the Convention on International Trade in Endangered Species of Wild Fauna and Flora, that are threatened with extinction, gathered in the high seas by Ukrainian vessels.

In the case of positive audit results, certification authorities shall grant the enterprise environmental certificates and permission to conduct ecolabeling.

Environmental management can be described as a proactive and productive number of activities done by economic entities, which aims to achieve their own environmental goals, create projects and programs developed based on environmental performance and environmental justice. This type of management is regarded as environmentally safe production management, through which an optimal balance between environmental and economic indicators is reached.

3 THE PURPOSE AND OBJECTIVES OF ENVIRONMENTAL MANAGEMENT

The purpose of any enterprise is to maximize profits while minimalizing operating costs. However, the process of obtaining income usually harms the environment. It is in the process of improvement of the production of goods and products nature was seized by the man in general. This problem has become acute only when society realized the need to protect the environment. The objective to reduce the negative impact on the environment is indeed the task of environmental management (Siebert, 1998, p. 198).

The main economic advantages of preventing environmental impact and environmental management are determined by the various potential benefits and additional opportunities associated with such activities, including:

- attracting investors' attention and creating additional grounds for investment benefits and privileges;
- using additional opportunities to influence consumers and increase the competitiveness of products and services produced;
- possibilities of improving the efficiency of marketing and advertising;
- attracting the attention of international organizations and the international community to the enterprise;
- using membership in international environmental unions of entrepreneurs;
- creating additional opportunities for developing relationships with business partners abroad;
- using the advantages of regional and national environmental leadership;
- with the creation of additional opportunities for development and strengthening of relations with local authorities and state ecological control, population, environmental community;
- with the creation and use of credibility in relations with investors, shareholders, local authorities and state environmental control, population, environmental public;
- with the creation of additional opportunities for strengthening and expanding positions on international commodity and financial markets (Soderbaum, 2000, p. 321).

Thus, the effective activity of the enterprise in the field of environmental management is considered as the main guarantee of environmental safety and the ability to manage environmental risks in the process of design and operation of facilities.

3.1 Implementation of an environmental management system at the enterprise

According to many scientists, the main goals of implementing the enterprise environmental management system and its certification include:

- reducing the negative impact on the environment;
- improving the environmental performance of the enterprise;
- improving the economic efficiency of the enterprise.

In developed countries, environmental certification is quite common, it is mandatory, and complements product and service certification. Due to the competition of ecological certification marks, in which individual sellers do not always follow the established rules, a special ISO Subcommittee on Eco-labeling of Products was created. The ecological certification is based on the requirements of ISO 14000 standards and was concluded in 1999 by the Agreement of Ten European Countries on the Mutual Recognition of Accreditation of Environmental Certification Bodies, Testing Laboratories, Certification of Inspection Bodies and Personnel. Thus, ecological certification of products (services) is carried out to stimulate the production of products, provide services and use technological processes that least pollute the environment and guarantee the safety of products (services) for life, health, property, and the environment. This necessitates ecological certification for all civilized countries (Kupalova & Ul'yanova, 2011).

Environmental management was created in advanced market economies to achieve parity between the economic interests of the producer and the environmental and social needs of society.

The main features of environmental management are (Zagorodniuk, 2014, p. 9):

- it is part of the overall environmental management system;
- it is a market-based environmental management system;
- its effect is limited at the territorial hierarchical level within the region, corporation, enterprises in the areas with market relations, and first of all, production.

The enterprise is the first and most important element that influences pollution and where the environmental gradation in human economic activity. Environmental management is closely linked to the enterprise strategy. The strategy of the modern enterprise is to achieve the necessary rates of economic development, increase in production volumes, profit in the conditions of fierce competition in foreign and domestic markets.

Features of environmental management of the enterprise are an organizational structure that provides environmental management at the enterprise; environmental policy of the enterprise; financing of environmental measures; industrial environmental monitoring; dissemination of environmental information.

The lack of an effective environmental management system and slow implementation of structural reforms and modernization of technological processes in the context of national economic growth lead to increased pollution. And these as follows support old, inefficient approaches to the use of energy and natural resources. The crucial role in the implementation of the environmental management system at enterprises is played by an environmental audit, which provides for a comprehensive environmental audit of the production system, financial activities, and compliance. The recommendations of the initial environmental audit of the enterprise are decisive for the implementation of all subsequent stages of implementation of the environmental management system and the content of specialized internal environmental documents: programs for the design and implementation of environmental management, guidelines from the environmental management system, internal environmental regulations of the company, etc. (Smolens'kyy, 2014, p. 75).

Attempts to create universal, binding, environmental regulations for economic activity in all the countries will be doomed to failure until the widening gap between poverty and wealth, basic socio-economic problems in developed and developing countries with a transition economy are resolved in the world, a favorable regime for access to goods on world markets are created, and effective mechanisms for financing development are developed.

3.2 Restoration of ecological balance due to the implementation of effective legal regulation

The environmental management system is often defined as a system of planning, organization, implementation, and control over the activities of the enterprise, aimed at achieving environmental goals and its long-term stable operation as a whole (Soderbaum, 2000, p. 99). Such a system implements environmentally-friendly activities that permeate all the functions of the enterprise. However, its main disadvantage is that it does not provide opportunities for creation, development, change of means and conditions for achieving the environmental goals of the enterprise, and assumes the use of only its available funds But it is known that priority is often given to economic goals, and environmental and environmental objectives are included in the overall plan of the enterprise to implement legislative regulations or through fierce competition.

Ukraine entered the top five European countries by the number of deaths caused by environmental pollution. This was reported by the Global Alliance for Health and Pollution (GAHP). According to research, 57,258 people die each year due to environmental pollution (Total Pollution Deaths) in Ukraine. Based on this number, Ukraine ranks fourth among European countries. The top three leaders in the region include Turkey (57,779 deaths), Germany (68,300) and the Russian Federation (118,687).

Table 2. ***Top 5 European Countries by Deaths from Pollution in 2017*** (Fuller, Sandilya, & Hanrahan, 2019)

№	Country	Total Pollution Deaths
1.	Russian Federation	118 687
2.	Germany	68 300
3.	Turkey	57 779
4.	Ukraine	57 258
5.	Italy	57 033

Also, Ukraine ranks fourth place in the number of deaths due to environmental pollution per 100 thousand people (Pollution Deaths per 100,000 population). Leading are Bulgaria (137), Georgia (140) and Serbia (175).

Table 3. Top 5 European Countries by Deaths from Pollution per 100,000 Population in 2017 (Fuller, Sandilya, & Hanrahan, 2019)

№	Country	Pollution Deaths per 100,000 population
1	Serbia	175
2	Georgia	140
3	Bulgaria	137
4	Ukraine	128
5	Bosnia and Herzegovina	125

The Alliance stated that India (2,326,771), China (1,865,566), Nigeria (279,318), Indonesia (232,974), Pakistan (223,836), Bangladesh (207,922) and United States (196,930) are the leaders in the number of premature deaths in the world due to environmental problems.

According to the State Statistics Service of Ukraine, emission density from stationary sources of pollution per 1 square km of the country's territory averaged 4.35 tons of harmful substances in 2018 (per capita - 59.3 kg). However, in some regions, these figures far exceeded the average in Ukraine. In particular, in Donetsk region emissions per 1 square km was 6.9 times bigger (per capita bigger by 2.1 times), in Dnipropetrovsk - by 4.4 and 3.2 times respectively, in Ivano-Frankivsk - 3.7 and 2.7 times. Enterprises of Kyiv have produced 35 tons of pollutants per 1 square km into the atmosphere, which exceeded the national average by 8 times. (Official site of the State Statistics Service of Ukraine)

It should be noted that in the face of exacerbation of the ecological crisis in the world, it is extremely important to find ways to restore the ecological balance through the introduction of effective legal regulation. The main trends that characterize the state of environmental safety show that two-thirds of harmful substances get into the air from stationary sources of pollution of industrial enterprises, whose environmental activities are not regulated by clear regulatory documents. At the state level, environmental policy should identify the main tools and levers of environmental impact. They must be both administrative and market-based. Nowadays in Ukraine, the environmental status is regulated through standardization and environmental regulation. At the same time, if the standards are clear and binding, then the rules established in

environmental activities determine the maximum permissible limits of the impact of the enterprise on the environment in which it must operate. Such rules and regulations are intended to assist enterprises in the development of production capacities, taking into account the established values of certain environmental impact factors (for example, emissions into the atmosphere, mining, waste management, etc.).

Important sources of development of legal and regulatory issues for environmental management in Ukraine would be such components as economic and environmental regulation, environmental audit and environmental licensing. *Economic and environmental regulation* is the establishment of boundaries within which the development of production and changes in the natural properties of the natural environment are allowed. It should be noted that in Ukraine this element is characterized by a large number of regulations that are either declarative or radically different, and sometimes contradictory. According to current legislation, environmental regulations include environmental safety standards and the maximum permissible levels of emissions and discharges into the environment. Environmental standards are developed and implemented by the Ministry of Ecology and Natural Resources of Ukraine.

The need for environmental audits is related to the lack of reliable information on the negative environmental impact of economic entities. *An environmental audit* is a documented systematic independent process for evaluating an environmental audit entity. It includes the collection and objective evaluation of evidence to determine the compliance of certain activities, measures, conditions, environmental management systems and information on these issues with the requirements of the legislation of Ukraine on environmental protection and other criteria of environmental audit.

Environmental licensing sets environmental requirements and restrictions in the form of a special permit to conduct specific economic or other activities of environmental users in the relevant territory (facility).In Ukraine, environmental licensing involves the granting of a permit (license) for the implementation of a certain type of environmental activity.

4 CONCLUSIONS

The study results indicate a low level of implementation of the environmental management system according to ISO 14001 in the activity of Ukrainian enterprises. The regulatory support for environmental management is broad enough to cover international and national levels. However, there are many inconsistencies and declarations in the current legislation of Ukraine that need to be eliminated or specified to achieve the goals of the state's environmental policy. Also, the development of environmental management is constrained by a lack of financial resources. In such circumstances, government regulation in addition to administrative methods, such as mandatory standardization, should include market-based tools to encourage businesses. The implementation of environmental management into the practice of enterprise management will affect the improvement of ecological and economic management of it, contribute to the stabilization and development of the Ukrainian industry. The realization of the state strategy of sustainable development of the country and its regions implies a set of measures for state regulation of nature management and stimulation of environmental protection activities through the implementation of purposeful ecological and economic policy in the conditions of market relations.

Thus, the system of standards in the field of ecology is supposed to:

- ensure the implementation of the system of environmental legislation. the main directions of the state policy in the field of environmental protection, use of natural resources and control of ecological safety are determined based on these activities, not to forget nature protection programs for ecologically disadvantaged areas;
- manage the sustainable development of eco-labeling standards aimed at creating a single regulatory framework in the field and help to overcome trade barriers;
- to systematize the methods of ecological certification, which will lead to the stabilization of environmental policy and the creation of an economic and legal mechanism for the realization of the citizens right enshrined in the Constitution to a favorable environment.

- support the sustainable development of eco-labeling standards aimed at creating a single regulatory framework in the field and help to overcome trade barriers; systematization of environmental certification will lead to stabilization of environmental policy and the creation of an economic and legal framework for the implementation embodied in the Constitution the right of citizens to a healthy environment.
- systematization of environmental certification will lead to the stabilization of environmental policy and the creation of an economic and legal framework for the implementation embodied in the Constitution the right of citizens to a healthy environment.

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Received for publication:	26.12.2019
Revision received:	04.01.2020
Accepted for publication:	10.01.2020

How to cite this article?

Style – **APA** *Sixth Edition:*

Skrypnyk, N., Skrypnyk, M., & Rylieiev, S. (2020, January 15). Environmental management as a guarantee of enterprise development. (Z. Cekerevac, Ed.) *MEST Journal, 8*(1), 111-121. doi:10.12709/mest.08.08.01.13

Style – **Chicago** *Sixteenth Edition:*

Skrypnyk, Nataliia, Mykola Skrypnyk, and Serhii Rylieiev. 2020. "Environmental management as a guarantee of enterprise development." Edited by Zoran Cekerevac. *MEST Journal* (MESTE) 8 (1): 111-121. doi:10.12709/mest.08.08.01.13.

Style – **GOST** *Name Sort:*

Skrypnyk Nataliia, Skrypnyk Mykola and Rylieiev Serhii Environmental management as a guarantee of enterprise development [Journal] // MEST Journal / ed. Cekerevac Zoran. - Belgrade – Toronto : MESTE, January 15, 2020. - 1 : Vol. 8. - pp. 111-121.

Style – **Harvard** *Anglia:*

Skrypnyk, N., Skrypnyk, M. & Rylieiev, S., 2020. Environmental management as a guarantee of enterprise development. *MEST Journal,* 15 January, 8(1), pp. 111-121.

Style – **ISO 690** *Numerical Reference:*

Environmental management as a guarantee of enterprise development. **Skrypnyk, Nataliia, Skrypnyk, Mykola and Rylieiev, Serhii.** [ed.] Zoran Cekerevac. 1, Belgrade – Toronto : MESTE, January 15, 2020, MEST Journal, Vol. 8, pp. 111-121.

MEST Journal
DOI 10.12709/mest.08.08.01.14

SELECTED SAFETY FEATURES FOR MEDICINES SOLD IN TRADITIONAL PHARMACIES

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JEL Category: **I18, K33, K38**

Abstract

Nowadays, every EU resident can easily find advertisements of non-prescription medicinal products (over-the-counter drugs) on the Internet. They get to mailboxes as the so-called commercial information or can be seen on websites devoted to health in general or a specific disease. Certain drugs can also be found on various websites or via search engines. It is thus possible for patients to buy medicines through legal websites run by traditional pharmacies, but also through websites run by shady entities that can not be considered pharmacies or any other entities. That is why additional safety features for batches and individual packagings of medicines introduced on 9 February 2019 are so important.

Keywords: *law, Internet, safety, falsification of medicines, medicine serialization, EAN code*

1 INTRODUCTION

Nowadays, every EU resident can easily find advertisements of non-prescription medicinal products (over-the-counter drugs) on the Internet. They get to mailboxes as the so-called commercial information or can be seen on websites devoted to health in general or a specific disease. Certain drugs can also be found on various websites or via search engines. It is thus possible for patients to buy medicines through legal websites run by traditional pharmacies, but also through websites run by shady entities that can not be considered pharmacies or any other entities.

Purchasing medicines at a distance entails certain risks, such as:

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- no personal contact and full identification of the parties, especially the pharmacy (risk of fraud),
- low level of patient's knowledge about rules governing the safe purchase of medicines,
- sale of medicines that have not been legally authorized,
- sale of counterfeit medicines (falsified medicines),
- sale of expired medicines.

That is why additional safety features for batches and individual packagings of medicines introduced on 9 February 2019 are so important.

The article attempts to answer the following questions: what safety features have been introduced by the new EU regulations, and how can we protect ourselves from buying medicines that come from uncertain sources, e.g. the Internet.

The article employs the dogmatic and legal research method, which consists in analyzing and interpreting EU regulations and selected literature.

A hypothesis has been put in the paper: The newly introduced additional safety features for batches of medicines increase the safety of purchase when buying medicines both online and in traditional pharmacies.

The article ends with conclusions.

2 THE LEGAL BASIS – CORE NOTIONS

In Polish law, the sale of medicines has been regulated in Article 68 Paragraph 3 of the Act of 6 September 2001 - Pharmaceutical Law (EC, 2001). This provision allows pharmacies and rural pharmacy shops[1] to sell non-prescription medicinal products at a distance, except for medicinal products that can be dispensed only to patients of a certain age[2].

Distance selling[3] has been defined in Article 2 Paragraph 37aa of the above Act as an agreement for sale of medicinal products concluded with the patient without the simultaneous presence of both parties[4], using means of distance communication, in particular, a printed or electronic order form, unaddressed or addressed, serial letter in printed or electronic form, press advertisement with printed order form, electronic advertisement, catalog, telephone, facsimile, radio, television, automatic calling device, video telephone, video text, e-mail, or other means of electronic communication within the meaning of the Act of 18 July 2002 on the provision of electronic services (Polish law, 2017).

The Regulation of the Minister of Health of 26 March 2015 on distance selling of medicinal products (Regulation, 2015), issued in order to implement the provisions of the said Act, lays down the requirements concerning distance selling[5] . Pursuant to Paragraph 2 Subparagraph 1 of this legal act, the sale of medicinal products

[1] According to data published by the Central Statistical Office of Poland, at the end of 2018 there were 12.9 thousand pharmacies and 1.2 thousand rural pharmacy shops (a type of pharmacy that can be located only in rural areas and can not sell certain strong medicines) in Poland; they employed 60.3 thousand pharmacy masters and technicians.

[2] Judgment of the Court of Justice of 21 June 2012, C-84/11: Judgment of the Court (Third Chamber) of 21 June 2012. Marja-Liisa Susisalo, Olli Tuomaala and Merja Ritala. Reference for a preliminary ruling: Korkein hallinto-oikeus - Finland. Article 49 of TFEU - Freedom of establishment - Public health - Pharmacies - National authorization system for operating pharmacies - Establishment of branches - Different conditions depending on whether they apply to private pharmacies or to the pharmacy of the University of Helsinki - the University of Helsinki pharmacy with specific obligations related to pharmaceutical training and drug supply. Case C-84/11, (EU law, 2012).

Order of the Court of Justice of 29 September 2011, C-315/08: Order of the Court (Seventh Chamber) of 29 September 2011 (reference for a preliminary ruling from the Consiglio di Stato - Italy) - Angelo Grisoli v Regione Lombardia (Article 104(3), first indent, of the Rules of Procedure — Article 49 TFEU — Freedom of establishment — Public health — Pharmacies — Proximity — Supply of medicinal products to the population — Operating authorisation — Territorial distribution of pharmacies — Minimum distance between pharmacies), (EU law, 2012), Legalis.

[3] Judgment of the Supreme Administrative Court of 2 September 2009, II GSK 5/09, Reasoning: Provision of Article 544 § 1 of the Civil Code does not use the term "distance selling", nor does it contain interpretative rules such as the following: "means", "should be understood as", "is considered", etc., which would allow the assumption that the legislator has included a legal definition of "distance selling" in this legal norm. In a situation where the Act of 6 September 2001 - the Pharmaceutical Law (Journal of Laws of 2004 No. 53, item 533, as amended) also does not contain such a definition, the resolution of the disputed issue requires an analysis of this Act's regulations regarding the principles of: marketing of medicinal products, operating a pharmacy (or a rural pharmacy shop), conditions for distance selling of non-prescription medicinal products (Article 68 Paragraph 3a), as well as the rules for dispensing compounded drugs (Article 96 Paragraph 7), Legalis.

[4] Judgment of the Voivodeship Administrative Court in Warsaw of 7 May 2009, VII SA/Wa 392/09, Reasoning: Since the Act of 6 September 2001 - the Pharmaceutical Law (Journal of Laws of 2004 No. 53, item 533, as amended) does not contain a legal definition of "distance selling", therefore one should refer to the regulations of this Act stipulating the rules of medicinal products marketing, operating a pharmacy and dispensing medicinal products to patients by traditional pharmacies. This applies in particular to the analysis of regulations on the terms of "distance selling" of non-prescription medicinal products and regulations on the dispensing of compounded drugs (Article Article 68 Paragraph 3a and Article 96 Paragraph 7 of the said Act), Legalis.

[5] In 2017, 280 pharmacies and 4 rural pharmacy shops declared selling medicinal products online.

at a distance is possible after the patient has placed an order:

1. in the premises of a pharmacy or rural pharmacy shop;
2. by phone;
3. by fax;
4. via email;
5. using a form on the pharmacy's website.

A question arises about the above-mentioned form: should it be allowed only on websites of pharmacies or also on fora about health and websites of intermediaries?

A linguistic interpretation of the provision suggests that an online medicine purchase form should be allowed on websites run by pharmacies legally operating in Poland[6]. However, if we concentrate on the legislator's intention, then the form can be allowed on web portals devoted to health, internet fora, and websites of intermediaries selling diverse products. In practice, it does not mean such entities can act as mediators in concluding online contracts. It would contradict the provisions of the above-mentioned Regulation, which allow distance selling only in cases stipulated in the provisions, and one of them is selling "using a form on the pharmacy's website".

The provisions of the said Regulation should receive a negative assessment because they do not fully achieve the legislator's goal. The so-called "third party" acting as a mediator in the online sale does not conclude a distance purchase/sale agreement.

3 INTERNET PHARMACIES

The EU pharmaceutical industry (pharmacies, rural pharmacy shops, pharmaceutical wholesalers) is nowadays a special sector of the economy characterized by innovativeness and technological sophistication. Poland is currently the largest pharmaceutical market in Central and Eastern Europe.

One of the industry's major problems is the falsification of medicines[7]. It poses a threat to the safety[8]of patients, especially when they purchase medicines on the Internet[9].

On 9 February 2019, traditional pharmacies faced a new technological challenge (Naughton, 2017). The quality of Internet connection in some regions of Poland can significantly delay the process of receiving information about the authenticity of medicines[10]. At the same time, most of the scanners used by pharmacies can not read the new code introduced by the Commission Delegated Regulation (EU) 2016/161 of 2 October 2015 supplementing Directive 2001/83/EC of the European Parliament and of the Council by laying down detailed rules for the safety features appearing on the packaging of medicinal products for human use (Regulations, 2015).

Due to the newly introduced obligation of serialization, it will possible, during the transitional period, to use both the existing EAN-13 (the so-called EAN code) and GS1 DataMatrix code on the packagings of medicinal products.

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[6] In November 2018, the value of online sales of medicines amounted to PLN 55 million, showing a 27% dynamics compared to November 2017. (AM, 2018)

[7] "WHO perceives Poland as a high risk country in terms of drug counterfeiting. It is also a transit country through which counterfeit pharmaceuticals get to the West. In recent years, customs services have intercepted between 100,000 and 160,000 counterfeit drugs annually. (...) 430,000 steroids in ampoules, 100,000 Viagra tablets and 48 machines for their production (...)" (Sitek, 2018) 50% of antimicrobial drugs in the world may be counterfeit. In developing countries, this can amount up to 76%. According to WHO quality tests, 7.6% of the most popular antibiotics lack their active substance, and among substandard drugs (coming from legal sources where such a defect is due to e.g. technological error) that problem occurs in 17.8% of antibiotics and 13% antiparasitic drugs. Up to 90% of antimalarial drugs in Africa are of poor quality. (NIL, 2018)

[8] Article 37 of the Commission Delegated Regulation (EU) 2016/161 of 2 October 2015 supplementing Directive 2001/83/EC of the European Parliament and of the Council by laying down detailed rules for the safety features appearing on the packaging of medicinal products for human use (Regulations, Commisssion delegated regulation (EU) 2016/161, 2016, p. 1).

[9] Directive 2011/62/EU of the European Parliament and of the Council of 8 June 2011 amending Directive 2001/83/EC on the Community code relating to medicinal products for human use, as regards the prevention of the entry into the legal supply chain of falsified medicinal products (Legislative acts, 2011).

[10] In Poland, the average internet connection speed is increasing and is currently above the global average - 54.5 Mbps compared to 54.33 Mbps (the study We Are Social - Digital 2019). However, compared to many European countries, e.g. Germany, Sweden, Switzerland, Belgium or Spain, where the average Internet speed is 70-100 Mbps, the Polish Internet is relatively low. (PAP, 2019)

4 SAFETY FEATURES FOR MEDICINAL PRODUCT PACKAGINGS

The first question to be answered in this section of the paper should be what the EAN code is. The EAN code is a number assigned to medicine together with its marketing authorization by the President of the Office for Registration of Medicinal Products, Medical Devices and Biocidal Products. The EAN code is an identifier of each medicinal product packaging registered in Poland. In order to assign the right code, the drug's active substance, its strength, form and dosage, as well as the size and type of packaging must be considered. As a result, the code on the packaging of medicine containing 1 mg of an active substance will be different from the code on the packaging of medicine containing 2 mg of that substance. Different codes will be assigned to medicines with the same strength (active substance) but sold in different packs, e.g. 10 or 20 tablets.

The EAN code is composed of the following elements (Bondaryk & Kruk, 2011):

- the first three digits - 590 - are the EAN prefix for the EAN national organization in Poland;
- the next three digits - 999 - are the coding unit number assigned to the Ministry of Health;
- the next five digits are the number of the product's marketing authorization;
  - the next (12th) digit indicates the type and size of the packaging;
  - the last (13th) digit is a check digit.

The second question is whether there is an obligation to change the code in certain cases. The EAN code does not have to be changed whenever the wording of the marketing authorization is changed. However, it has to be changed in the event of changes in the parameters, that is the changes affecting the medicine's active substance and strength, its pharmaceutical form (tablets, liquid) and dosage, or the size and type of the packaging.

Pursuant to the Annexes to the Regulation of the Minister of Health on making changes in marketing authorizations and documentation of medicines (n.d., 2014), a change in all of the above-mentioned parameters, except for the change in the size of the packaging, requires the submission of a new application for marketing authorization.

Therefore, the conclusion is that if there are changes in the medicine's active substance, strength, pharmaceutical form and dosage, the EAN code will necessarily be changed as a result of a new marketing authorization.

An analysis of the Annexes to the said Regulation shows that a change in the size and type of the packaging does not require the submission of a new application for marketing authorization. It will be a Type II change in the authorization. In this case, however, the EAN code should be changed, which stems from the wording of Article 23 Paragraph 3 of the Pharmaceutical Law. This provision enumerates the following elements of the marketing authorization:

- name and common name of the medicine provided the latter exists,
- form,
- method of administration,
- strength (potency),
- dosage of an active substance,
- full qualitative composition,
- size and type of packaging.

The obligatory use of the EAN UCC code is mentioned in Paragraph 10.

Taking into account the code's functions, the provision's wording seems justified. Therefore, the EAN code should be changed also when the medicine's name is changed. However, pursuant to the said Annexes to the Regulation of the Minister of Health, this is a Type I change in authorization, which does not require the submission of a new application, and does not affect any medically significant parameters.

Conclusion: the name of the medicine is usually changed only for marketing purposes, therefore there is no justification (purpose) for changing the EAN code.

What effect will the change of name have?

If pursuant to Article 23 Paragraph 3 of the Pharmaceutical Law, the aforementioned elements remain unchanged, the change of name entails in fact only the change of the packaging appearance. Thus, it is reasonable to conclude that changing the medicine's name is not a reason for changing the EAN code.

The recent changes were forced by the implementation of the so-called Falsified Medicines Directive. Therefore, in his

Communication of 7 February 2019, the President of the Office for Registration of Medicinal Products, Medical Devices and Biocidal Products (Kolakowski, 2019) allowed changes in the Electronic Register of Medicinal Products Authorized for Marketing on the territory of the Republic of Poland: the 13-digit number GTIN (EAN-13) shall be changed to a 14-digit GTIN code. An insignificant zero shall appear in front of the 13-digit GTIN (EAN-13) to form a 14-digit GTIN. At the same time, the existing marketing authorizations do not have to undergo post-authorization changes regarding GTIN (EAN-13) identification numbers. When it comes to new marketing authorizations, the 13-digit GTIN (EAN-13) identification numbers will be entered as before, irrespective of the medicine's category (prescription, non-prescription, etc.).

Another change was implemented by the Information of the President of the Office for Registration of Medicinal Products, Medical Devices and Biocidal Products of 28 May 2019 on identification numbers (EAN/GTIN codes) placed on the packagings of medicinal products (Cessak, 2019). A medicine packaging can only be identified by a single identification number (EAN/GTIN code) stipulated in the marketing authorization. The aforementioned authorization assigns 13-digit identification numbers (the so-called EAN codes) to individual pack sizes. Using the EAN code, the marketing authorization holder (MAH) creates a 14-digit identification number by adding a zero before the existing 13-digit number. The 14-digit number is placed on the packaging of medicinal products as "PC" (product code) and in the two-dimensional DataMatrix code (2D code). The Office permits two codes to be placed on the packaging at the same time: EAN code and 2D code provided that the identification numbers are the same (except for the zero added). It is not permissible for the 2D code to contain an identification number different than the one in the EAN code and marketing authorization. It is forbidden to place two different identification numbers on the medicinal product packaging, one from the marketing authorization and the other from the marketing authorization holder. If the MAH wants to use their own GTIN code, they must notify the President of the Office for Registration of Medicinal Products, Medical Devices and Biocidal Products and obtain a decision on the change of the marketing authorization.

5 SERIALIZATION OF MEDICINES

The Commission Delegated Regulation (EU) 2016/161 published on 9 February 2016 lays down the requirements for marketing authorization holders, wholesalers and pharmacies (regular and hospital ones) regarding the serialization of medicinal products and confirmation of their authenticity. Serialization involves more detailed identification of medicines and makes it possible to distinguish particular packagings within one range of medicinal products (Arnould, et al., 2019).

The currently used bar code is a linear code, i.e. the EAN-13 code. Under the new legal requirements, the symbology for serialization purposes will be two-dimensional, like the GS1 DataMatrix code (Walczak, 2018).

All pharmacies will have to purchase special scanners able to read the 2D Data Matrix code[11]. The new code is printed on the unit packaging in an online mode as part medicine packaging process. It includes, e.g.:

- information about the batch number,
- expiry date,
- GTIN (Global Trade Item Number), i.e. a unique code of the medicine being a sequence of digits denoting the country of origin, manufacturer, product type (enables to include much more information in a small space). In a square consisting of 32 rows and 32 columns (ECC200 mode), it is possible to encode 60 8-bit ASCII characters or a

[11] In 2007-2008, the US (FDA), France (AFSSAPS) and Turkey (Ministry of Health) introduced a requirement to mark and identify medical products for human use with a special code. The so-called online coding in the form of 2D Data Matrix replaced the classic barcode.
Article 5 Paragraph 2 of the Delegated Regulation: The barcode shall be a machine-readable Data Matrix and have error detection and correction equivalent to or higher than those of the Data Matrix ECC200. Barcodes conforming to the International Organization for Standardisation/International Electrotechnical Commission standard ('ISO/IEC') 16022:2006 shall be presumed to fulfil the requirements set out in this paragraph.

sequence of 91 alphanumeric characters (Rzadca, 2013). Additionally, the 2D code contains redundant data. The algorithm allows one to decode it even if it is damaged or poorly printed.

The main goal of the solutions introduced by the Falsified Medicines Directive is to eliminate counterfeit medicines from the market.

"Unique identifier" is provided for in Article 3 Paragraph 2 Subparagraph a) of the Delegated Regulation as "the safety feature enabling the verification of the authenticity and the identification of an individual pack of a medicinal product". The composition of the unique identifier is stipulated in Article 4 of the Commission Delegated Regulation (EU) 2016/161:

- a code allowing the identification of at least the name, the common name, the pharmaceutical firm, the strength, the pack size and the pack type of the medicinal product ("product code"),
- a numeric or alphanumeric sequence of maximum 20 characters, generated by an algorithm ("serial number"),
- the batch number,
- the expiry date.

Pursuant to the provisions of Article 9 of the aforementioned Regulation, barcodes on the packagings of medicines "which must bear the safety features pursuant to Article 54a of Directive 2001/83/EC shall not bear on their packaging, for the purpose of their identification and verification of their authenticity, any other visible two-dimensional barcode than the two-dimensional barcode carrying the unique identifier".

6 COMMON LOGO

Another safety feature is the so-called "Common logo" defined by the provisions of Commission Implementing Regulation (EU) No 699/2014 of 24 June 2014 on the design of the common logo to identify persons offering medicinal products for sale at a distance to the public and the technical, electronic and cryptographic requirements for verification of its authenticity (Barroso, 2014). This basic graphic identifier of a legally operating online pharmacy is common to the entire European Union. It consists of a white cross against green stripes and the flag of a Member State.

Figure 1 The model of online pharmacy logo
Source: Commission Implementing Regulation (EU) No 699/2014

Under the common logo there is a flag of a Member State, which denotes the place of residence or the registered office of an entity selling medicines at a distance, and information "Click to verify if the website is operating legally" in the language of a given Member State.

Clicking on the common logo will automatically redirect one to the website confirming that the pharmacy or rural pharmacy operates legally, i.e. is authorized to sell medicines at a distance via the Internet.

As regards Polish regulations, pursuant to Article 115 Paragraph 2 Subparagraph 5 of the Pharmaceutical Law, the Main Pharmaceutical Inspector publishes the current list of Polish pharmacies and rural pharmacy shops authorized to sell non-prescription medicinal products at a distance in the "Public Information Bulletin" of the Main Pharmaceutical Inspectorate.

A question that needs to be answered now is about the mandatory elements of the website run by a legally operating online pharmacy.

The pharmacy website must contain, in a visible place, a set of relevant information that will allow each user to identify it:

- every pharmaceutical seller must have their registered office. Selling medicines without a registered office is illegal, so every pharmacy must have an address,
- a precise list of terms and conditions, e.g. time and method of delivery, rules of return and complaint,
- medicine prices must be set clearly and unambiguously.

Legally operating online pharmacies can not:

- offer discounts,
- sell prescription-only medicines,
- conduct advertising activities.

7 CONCLUSION

All medicinal products subject to serialization and placed on the market after 9 February 2019 have to have a unique identifier and 2D code. Needless to say, in the initial stage of the new system implementation, medicinal products that received marketing authorization before 9 February 2019, and thus do not have the discussed safety features, will be still available on the market until they are sold out or expire. It is estimated that 90% of medicines will have had the new safety features three years after the new system was implemented. A lack of safety features on the packaging of a medicinal product should not be a reason for refusing to dispense it to the patient.

The conducted analysis of the European and national legal regulations allows to draw the following conclusions regarding the Internet:

- it is a channel for disseminating information about medicines and their prices via web portals devoted to health,
- it enables patients to place orders for specific medicines and pick them up in traditional pharmacies or get them delivered to their home addresses,
- the transaction is carried out at a distance via the web.

Will the new safety measures protect potential patients against counterfeit medicines? At the moment - yes, but it should be borne in mind that medicine counterfeiters will always stay up-to-date with innovation processes taking place in the administration and IT. This means that after a certain period of time the safety features may be broken by entities operating illegally on the medicine market.

The activity of the Polish Main Pharmaceutical Inspector should be assessed critically. In the legal state as of today, the Inspector does not meet social expectations regarding supervision over the online sale of medicines.

A de lege ferenda suggestion to be put forward is to establish the so-called pharmaceutical police and a special section to counteract the sale of falsified medicines online.

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Received for publication: 08.08.2019
Revision received: 19.09.2019
Accepted for publication: 10.01.2020

How to cite this article?

Style – **APA** *Sixth Edition:*

Stych, M. (2020, January 15). Selected safety features for medicines sold in traditional pharmacies. (Z. Cekerevac, Ed.) *MEST Journal, 8*(1), 122-130. doi:10.12709/mest.08.08.01.14

Style – **Chicago** *Sixteenth Edition:*

Stych, Marek. 2020. "Selected safety features for medicines sold in traditional pharmacies." Edited by Zoran Cekerevac. *MEST Journal* (MESTE) 8 (1): 122-130. doi:10.12709/mest.08.08.01.14.

Style – **GOST** *Name Sort:*

Stych Marek Selected safety features for medicines sold in traditional pharmacies [Journal] // MEST Journal / ed. Cekerevac Zoran. - Belgrade – Toronto : MESTE, January 15, 2020. - 1 : Vol. 8. - pp. 122-130.

Style – **Harvard** *Anglia:*

Stych, M., 2020. Selected safety features for medicines sold in traditional pharmacies. *MEST Journal,* 15 January, 8(1), pp. 122-130.

Style – **ISO 690** *Numerical Reference:*

Selected safety features for medicines sold in traditional pharmacies. **Stych, Marek.** [ed.] Zoran Cekerevac. 1, Belgrade – Toronto : MESTE, January 15, 2020, MEST Journal, Vol. 8, pp. 122-130.

MEST Journal
DOI 10.12709/mest.08.08.01.15

CONSCIENTIOUSNESS IN THE IMPLEMENTATION OF STATE CONTROL AND ENTERPRISES-PARTICIPANTS OF FOREIGN ECONOMIC ACTIVITY

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JEL Category: **F31, O24**

Abstract

The modern reform of control and surveillance activity determines the main direction of verification measures addressed to persons engaged in unscrupulous entrepreneurial activity, thereby reducing the administrative weight on conscientious entrepreneurs. The modern essence of the principle of conscientiousness is set out in paragraphs 3 and 4 of Art. 1 of the Civil Code of the Russian Federation: in establishing, exercising and protecting civil rights and in the performance of civil duties, participants in civil relations must act in conscientiousness. No one has the right to take advantage of his illegal or unfair behavior. The application of the "conscientious" criterion in relation to enterprises engaged in foreign economic activity is due to the transition of customs authorities to the implementation of a subject-oriented model of a risk management system. In October 2017, the Charter of Conscientious Participants in Foreign Economic Activity was signed in Russia, where Russian and foreign legal entities and individual entrepreneurs conducting their business in the field of foreign economic activity, said on the establishment of bona fide forms of carrying out their foreign economic activity, as well as interaction with partners, contracting parties and government bodies. The categorization system of the Federal Customs Service of Russia is set up in such a way, that the fewer violations the organization makes, the higher the probability of classifying it as a low-risk category. At present, the categorization of participants in foreign economic activity is carried out in the industry and automated form.

Keywords: *conscientiousness of entrepreneurial activity, control and surveillance activity of state bodies, factors of an enterprise's conscientiousness*

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1 INTRODUCTION

The modern reform of control and surveillance activity determines the main direction of verification measures addressed to persons engaged in unscrupulous entrepreneurial activity, thereby reducing the administrative weight on conscientious entrepreneurs.

In the current legal field of the Russian Federation, there is no clear definition of the concept of "conscientious entrepreneur," however, signs of conscientiousness are described in sufficient detail in various documents. The modern essence of the principle of conscientiousness is set out in paragraphs 3 and 4 of Art. 1 of the Civil Code of the Russian Federation: in establishing, exercising and protecting civil rights and in the performance of civil duties, participants in civil relations must act in conscientiousness. No one has the right to take advantage of his illegal or unfair behavior. (Putin, 2019) From this provision, it follows that, firstly, the principle of good faith applies to all stages of behavior of participants in civil relations (applies to establish, exercise and protect rights), and, secondly, acts as a limiter to the manifestation of the autonomy of the participants' will in civil legal relations, the form of expression of which is the prohibition of such illegal or unfair behavior that may lead to the benefits arising from this behavior.

Also, in GOST R 57676-2017 "The conformity assessment. Ensuring conscientiousness in the production of goods, the provision of services, the performance of work. Qualitative indicators of assessment" (GOST, 2017) clearly defined signs of conscientiousness in the field of labor relations, in the field of tax legislation, in the field of ensuring responsibility to clients and customers.

The transition from comprehensive control (supervision) to differentiated inspection planning, as previously noted, will increase the coverage of potential violators of mandatory requirements that pose a direct threat of harm to legally protected values, and at the same time reduce the weight on legal entities and individual entrepreneurs who do not represent real threats to harm such values.

2 ANALYSIS

The introduction of a risk-based approach in the implementation of state control should lead, according to international experience, to a decrease in the number of inspections for bona fide market participants whose activities do not pose a significant threat to the values protected by law. At the same time, the preservation or even increase of the level of protection of values protected by law in the field of public administration should be ensured (figure 1).

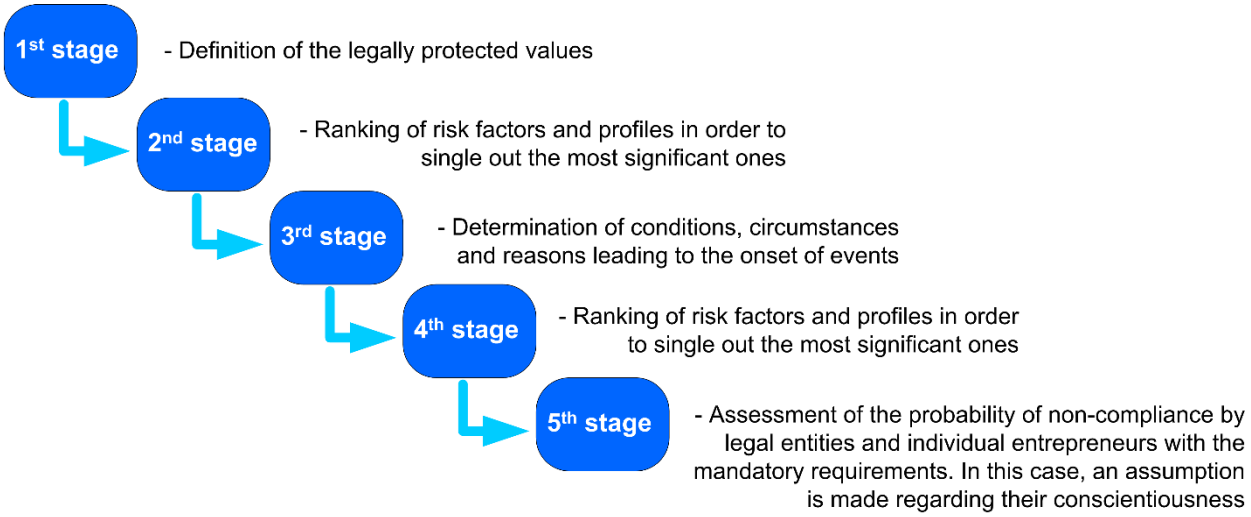

Figure 1. The main stages of the implementation of the risk-based approach to the implementation of control and surveillance activity.

The legally protected values are understood as the life and health of citizens, the rights, freedoms and legitimate interests of citizens and organizations, their property, the preservation of animals, plants, other environmental objects, objects of historical, scientific, cultural significance; maintaining public morality and ensuring the established order the implementation

of state administration and local governments, ensuring the country's defense and state security, stability of the financial sector, unity of economic space, free movement of goods, services and financial resources, support for competition and freedom of economic activity.

For each type of state control (supervision), the values should be determined, the protection of which the implementation of these powers is directed. In determining the legally protected values, it is necessary to strive for a quantitative determination of the units by which the amount of harm caused is recorded, including the intangible nature (i.e., the measurement of the harm done).

The application of the “conscientious” criterion in relation to enterprises engaged in foreign economic activity is due to the transition of customs authorities to the implementation of a subject-oriented model of a risk management system. The basis of this system is the distribution of participants in foreign economic activity into three categories of risk level (low, medium and high) depending on the assessment of the probability of violation of customs legislation with the differentiated application of customs control measures to them. In their activities, customs authorities most often do not proceed from the category of “conscientious”, but from the category of “participants in foreign economic activity with a low risk of violation of customs legislation”. Conceptually, the implementation of this approach means that for companies located in the "green corridor", i.e. working in risk-free zones, the forms of actual control will be minimized or eliminated by shifting the emphasis to control after the release of the goods.

In October 2017, the Russian Union of Industrialists and Entrepreneurs, the Chamber of Commerce and Industry of the Russian Federation, the All-Russian Public Organization “Business Russia” and the All-Russian Public Organization of Small and Medium-sized Enterprises “OPORA of Russia” signed the Charter of Conscientious Participants in Foreign Economic Activity (hereinafter - the Charter), where Russian and foreign legal entities and individual entrepreneurs conducting their business in the field of foreign economic activity (hereinafter FEA), said on the establishment of bona fide forms of carrying out their foreign economic activity, as well as interaction with partners, contracting parties and government bodies (Shokhin, Repik, Kalinin, & Katyrin, 2017).

In the Charter, as in many documents used in customs business, there is no clear definition of the category “conscientious participant in foreign economic activity”. Most often, it is a question of determining the signs of good faith. Within the framework of this document is meant:

1. the veracity of the declaring and the incentive to maximize the veracity of the declaring by other participants in foreign economic activity who are not members of the Charter;
2. the assistance to the implementation of effective customs control and the desire to minimize the number of customs violations up to their complete elimination.

Six basic criteria are applied, when identifying at least one of which a participant in foreign economic activity cannot be classified as a low level of risk, regardless of the results of calculation of indicators by other criteria:

1. Business entities that, without giving reasons, evade the submission to the customs authority of documents and information necessary for conducting a customs inspection after the release of goods.
2. Arrears in the payment of customs duties and taxes (taken into account on the tenth day after the expiration of the period of voluntary payment. This period is set in the customs payment notification and is 20 days from the date of its receipt. Thus, the person is given an additional 10 days to resolve possible objective factors of non-payment debt in a timely manner (for example, a postal item arrived late, an error in the details of a payment document, etc.).
3. As a criterion, the non-payment an administrative fine is triggered after 70 days from the date of entry into force of the decision of the customs authority. That is, in this case, the person is also provided with an additional 10 days. At the same time, the amount of arrears of customs payments and fines is not considered in any way.
4. The presence of a foreign economic activity participant in the phase of liquidation or termination of his activity.

5. The presence of a final conviction of a court under Article 194 of the Criminal Code of the Russian Federation
6. The assignment of a foreign economic activity participant to a high level of tax risk according to the categorization of the Federal Tax Service of Russia.

If there are no factors in the organization's activity that determine the identification of blocking criteria, then the category of risk level for this organization will be determined by the analysis of its activity according to the remaining 29, the so-called analytical criteria.

Such criteria are divided into 2 groups: positive and negative ones. Positive criteria evaluate the positive aspects of a foreign economic activity participant's working, such as:

- the size of the authorized capital;
- the period of foreign economic activity;
- the size of customs payments;
- the using of the services of the Personal Account;
- the classification by the tax service as a low level of tax risk;
- the export orientation.

Negative criteria, in turn, assess the presence of negative aspects in the organization's activity, including:

- the share of turnover with offshore zones;
- significant deviations of the main indicators of customs declaring (weight, cost) from the average values for similar goods;
- volumes of goods supply from a country that is not a country of origin;
- violations founded out by the results of customs control before and after the release;
- the taking to administrative responsibility, as well as the initiation of criminal cases.

Positive and negative criteria are evaluated exclusively in combination. That is, none of these criteria alone can be the basis for classifying the organization as a specific risk category.

The categorization system of the Federal Customs Service (hereinafter FCS) of Russia is set up in such a way, that the fewer violations the organization makes, the higher the probability of classifying it as a low-risk category. At the same time, a complete absence of violations or not exceeding a minimum of its value is not required. It all depends on the share of these violations in the total volume of goods delivered, as well as on the timeliness and completeness of the organization's actions aimed at minimizing the negative consequences of such violations and preventing them from happening again.

A special place among the factors affecting the assignment of the status of "conscientious participant in foreign economic activity" is occupied by tax risks.

The taxpayer's conscientiousness is determined by the degree of tax risk associated with its activities. Tax risk can arise if reduced tax rates, tax benefits, tax exemptions, favorable conditions of international treaties are applied, and the business is fragmented to apply special tax regimes. In these situations, the tax authority will assess whether the conditions for their application are artificially created in order to reduce taxes, and in this regard, the tax authority must provide evidence that the taxpayer is unscrupulous (FNS, 2017).

The tax authorities apply the procedures for collecting, recording and evaluation of the evidence, which are established by the tax and fees legislation (Article 54. of the Tax Code of the Russian Federation), and which make it possible to assess whether there was an abuse of the right or not (Putin, 2000).

The abuse of the right is the performance of business operations, the totality of deals or actions (inaction), the main purpose of which is the failure to fulfill (incomplete fulfillment) of the obligation to pay taxes and fees, as well as the unlawful receipt of the right to reimburse (refund, offset) taxes and fees (Putin, 2000).

According to the results of tax audits, tax authorities should correctly qualify the identified circumstances and, at the same time, refer to a specific paragraph of Art. 54.1 of the Tax Code of the Russian Federation.

The taxpayer distorts information about facts of economic activity, that is, receives unjustified tax benefit for the following purposes:

- reduction of the tax base and (or) the amount of payable tax,
- incorrect application of the tax rate,
- improper application of tax benefits,
- improper application of the tax regime,

- manipulation of taxpayer status, etc.,
- as well as circumstances indicating intentional actions by the taxpayer.

When analyzing the situation with the taxpayer, it is important to understand the manifestation of what signs even the most conscientious taxpayer can fall into the zone of increased attention from the tax authorities.

Based on the current arbitration practice in the Russian Federation, an additional list of criteria that tax authorities apply to prove the counterparty's "problematicity" is highlighted:

- the minimum amount of authorized capital, which is formed by property contributed by the founder;
- state registration is carried out on invalid or lost passports;
- a permanent executive body is absent at the location (place of state registration) of a legal entity;
- reporting to the tax authorities is not submitted;
- there is no staff capable of performing work (services) provided by the organization;
- the founder, the head and the chief accountant are the same person;
- there is no property which is necessary for doing business;
- systematically on an ongoing basis, the company claims for VAT refund, while declaring disproportionately the minimum amount of revenue.

Apart from the results of the analysis of the organization's activities according to the criteria established by the FCS of Russia, there are other two basic conditions for classifying as a low-risk category.

The first condition is the presence in the analyzed period, which is 2 years, at least 100 issued goods declarations. This meaning expresses the minimum volume of a statistical sample of information to be analyzed in order to recognize the result of such analysis as correct.

The second condition is the minimum period of foreign economic activity, which is 2 years; but for organizations that have a positive reputation with the tax authorities and are classified by the Federal Tax Service of Russia as a low level of tax risk; this requirement is reduced to 6 months.

Currently, the categorization of participants of foreign economic activity is carried out in the industry and automated form.

Industry categorization provides for the analysis of information to determine the level of risk and allows for the differentiated application of customs control in respect of industrial enterprises, car manufacturers, importers of fish and meat products, as well as exporters of domestic products. In this case, it is a question of the declarative nature of the categorization: an analysis of compliance with the established criteria is carried out based on documents and information submitted by the participant of FEA on his initiative. For each industry, the number of criteria varies, but a substantial part of the criteria is common. These criteria include:

- the size of the authorized capital;
- the value of the net assets of the organization;
- the main type of economic activity;
- number of staff;
- applicable tax system;
- volumes of foreign economic activity;
- fulfillment of obligations to pay customs duties, fines, and taxes administered by tax authorities;
- facts of taking to administrative responsibility.

Customs officials, on the grounds of the appeal of the Person, carry out the information collection and analysis. The date of the beginning of the information analysis is the date of registration of this appeal by the FCS of Russia.

The total period for the information collection and analysis should not exceed 30 calendar days from the date of registration of the Person's appeal. Based on the results of the information analysis, if the Person's activities comply with the above criteria, the FCS of Russia decides to classify the Person as a low-risk category. On the strength of this decision, the FCS of Russia issues an order to classify the Person as a low-risk category, indicating its name and TIN.

As of October 1, 2019, the list of persons classified as low risk by industry form includes 374 organizations, which accounted for about 10% of goods declarations and 13% of customs payments in respect of goods transported over the 9 months of 2018 (FTS, 2019)

However, most foreign trade activity's participants at low risk are determined using an automated

categorization form. Within the framework of automated categorization, regardless of the transported goods type, the information analysis on the FEA participants' activities is carried out in accordance with the Procedure for Automatically Determining the Category of Risk Level of Participants in Foreign Economic Activity, approved by order of the Federal Customs Service of Russia dated December 1, 2016 No. 2256.

The automated risk categorization procedure provides for the analysis of the FEA participants' activities for the two calendar years preceding the month of its conduct. This procedure defines 35 criteria characterizing a FEA participant's activity on the basis of various aspects, including the presence of trade with offshore zones, changes in the dynamics of key indicators customs declaration, results of customs control, administrative liability, level of compliance with currency legislation, export orientation, the results of categorization by the Federal Tax Service of Russia.

The risk categorization is carried out quarterly by the customs bodies' regular software using the information resources of the Unified Automated Information System's central database of the customs authorities, the Federal Tax Service and the Central Bank of the Russian Federation.

As a result of the risk categorization for the IV quarter of 2019, the number of low-risk organizations amounted to 9,841, of which 4,067 organizations carried out import operations, 1,625 - export operations, 4,149 – import and export operations. The Unified Register of Small and Medium Enterprises includes 5,303 organizations classified as low risk (FTS, 2019).

3 CONCLUSION

The aspect of conscientiousness in the implementation of entrepreneurial activity is the most important characteristic of the organization. In the implementation of control and surveillance measures, it is precisely this aspect that is most often used in making decisions on conducting verification activities. In the field of customs business, at present, the categorization of participants in foreign economic activity is carried out in the industry and automated form. Industry categorization provides for the analysis of information to determine the level of risk and allows for the differentiated application of customs control in respect of industrial enterprises, car manufacturers, importers of fish and meat products, as well as exporters of domestic products. However, the majority of foreign trade activity's participants in low-risk are determined using an automated categorization form.

Finally, it can be said that at present, both the enterprises-participants in foreign economic activity and the customs authorities of Russia are actively using conscientiousness criteria in their practice. The first ones do this to obtain some relief from the state control and surveillance in relation to their activities and the second ones do this to increase the effectiveness control and supervision measures.

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Received for publication: 27.12.2019
Revision received: 06.01.2020
Accepted for publication: 10.01.2020

How to cite this article?

Style – **APA** *Sixth Edition:*

Terekhova, E. A., Mineva, O. K., & Minev, V. S. (2020, January 15). Conscientiousness in the implementation of state control and enterprises-participants of foreign economic activity. (Z. Cekerevac, Ed.) *MEST Journal, 8*(1), 131-137. doi:10.12709/mest.08.08.01.15

Style – **Chicago** *Sixteenth Edition:*

Terekhova, Ekaterina Anatolyevna, Oksana Karlovna Mineva, and Vladislav Sergeevich Minev. 2020. "Conscientiousness in the implementation of state control and enterprises-participants of foreign economic activity." Edited by Zoran Cekerevac. *MEST Journal* (MESTE) 8 (1): 131-137. doi:10.12709/mest.08.08.01.15.

Style – **GOST** *Name Sort:*

Terekhova Ekaterina Anatolyevna, Mineva Oksana Karlovna and Minev Vladislav Sergeevich Conscientiousness in the implementation of state control and enterprises-participants of foreign economic activity [Journal] // MEST Journal / ed. Cekerevac Zoran. - Belgrade – Toronto : MESTE, January 15, 2020. - 1 : Vol. 8. - pp. 131-137.

Style – **Harvard** *Anglia:*

Terekhova, E. A., Mineva, O. K. & Minev, V. S., 2020. Conscientiousness in the implementation of state control and enterprises-participants of foreign economic activity. *MEST Journal,* 15 January, 8(1), pp. 131-137.

Style – **ISO 690** *Numerical Reference:*

Conscientiousness in the implementation of state control and enterprises-participants of foreign economic activity. **Terekhova, Ekaterina Anatolyevna, Mineva, Oksana Karlovna and Minev, Vladislav Sergeevich.** [ed.] Zoran Cekerevac. 1, Belgrade – Toronto : MESTE, January 15, 2020, MEST Journal, Vol. 8, pp. 131-137.

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ISSN 2334-7058 (Online)
DOI 10.12709/issn.2334-7058