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School of Education

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О.Г. Вагонова, д-р екон. наук, проф.;
М.С. Пашкевич, д-р екон. наук, проф.;
В.М. Шаповал, д-р екон. наук, проф.;
А.В. Бардась, д-р екон. наук, проф.

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Розглянуто нагальні проблеми економіки, інженерії, а також охорони навколишнього середовища. Особливу увагу приділено сучасному законодавству, спрямованому на вирішення цих проблем. Матеріали згруповано у розділи, що відповідають секціям форуму і відображають сучасні тенденції та інноваційні розробки молодих учених, представників різних країн світу в різних галузях економіки.

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Dear Students,

I would like to wish you all the best for your research in your subject field(s). Your detailed studies in your subject(s) will lead to discovering new information and reaching a new understanding.

Importance of research to the university

- Research discovers, elucidates and evaluates new knowledge, ideas, and the technologies essential in driving the future of society and humanity
- Research fosters professional excellence in faculty, important for delivering outstanding student education and training
- When our next generation of practitioners and leaders (students) engage in research, with its deliberate process and requirements for critical thinking skills, they become better students and are best prepared for the challenges and opportunities of the future.
- Research is an opportunity to make a difference and it is open to everyone and thrives on a diversity of approaches and perspectives
- Regionally, nationally and internationally, our research activities and services have critical economic, societal and environmental impacts (CSU,2018)

Research leads to original findings, products, and services. And an important underlying objective of research is the sharing and dissemination of the results of these activities - as during this event.

Good luck!

Ian Firth

[Ian Firth has worked as an EAP lecturer for the University of Ulster, the University of Roehampton, and the University of Leeds (UK)]

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Section 01. Modern Economics

Maryna Bohuslavskya

O.V. Varianychenko, research supervisor

S.I. Kostrytska, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Trade and economic relations between Ukraine and Lithuania: from retrospective to modernity

Lithuania is considered to be the largest trade partner of Ukraine among the Baltic States. In the 1990s, both countries signed the Free Trade Agreement, which was in force until the accession of the Republic of Lithuania to the EU. An analysis of the dynamics of bilateral trade indicators shows that, by 2005, Ukraine had a positive trade balance with Lithuania. After the bilateral free trade agreement expired, Ukrainian export was cut down sharply, while import continued to grow (with the exception of 2009, when import and export were cut down almost twice as a result of the crises in both countries). During 2015, for the first time since the economic crisis of 2009, the volume of bilateral trade was reduced.

The volume of bilateral trade in goods in 2015 amounted to 788.9 million USD and decreased by 43.4% compared with 2014. Ukrainian export amounted to 236.3 million USD and went down by 34.7%, import – 552.6 million USD and decreased by 46.5% as compared to the year before. The volume of bilateral trade in services for 2015 amounted to 47.4 million USD and decreased by 33.3%. Export of services declined by 28.0% to 33.1 million USD, while imports went down by 47.4% to 14.3 million USD. In 2016, the volume of bilateral trade increased by about 5% that reveals the positive trend.

Nowadays the main export from Ukraine consists of cereals, ferrous metals, petroleum products, machine building industry goods, wood and wood products, oil-cake and other solid residues of the food industry. At the same time, the main import from Lithuania includes petroleum products (the undisputed product-leader), polymers and plastics, machine-building products of the 84th-91st group of goods classification, as well as products of agriculture and food industry.

Investment activities are also an extremely important issue for the interaction between Ukraine and Lithuania. In 2017, the volume of investment in the Ukrainian industry (mainly in the processing industry) amounted to about 10% of the total investments, which suggests a strong cooperation between Ukraine and Lithuania in the economic area. To sum up, there are many examples of successful cooperation between Lithuanian and Ukrainian businesses. This enables Ukrainian enterprises to enter a new level of foreign economic activity. Regarding Dnipropetrovsk region, I believe that the coal, metallurgical and chemical industries have a potential for development, and therefore owners of top-companies should focus their efforts on bringing the product to new foreign markets. Taking into consideration that Lithuanian business has significant experience in foreign economic activity, in particular, re-export operations, Lithuania is a convenient platform for promoting Ukrainian export to the EU and other countries.

Efim Gosalov

O.V.Tryfonova, research supervisor

O.V. Khazova language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Problems of small business in Ukraine

Small business is an inalienable part of Ukrainian industry but now it is going through a really tough time as it reacts on market changes much faster than big enterprises. Small and medium business takes 58% of GPD and employs 68% of the working population in the developed countries. But in Ukraine small business accounts for only 5% of GPD and this situation negatively affects the Ukrainian economy.

In order to understand what changes should be made to improve the situation, it is necessary to identify the main problems of small businesses in Ukraine. There are some key barriers to small business development:

- permanent changes in the Tax Code;
- underdevelopment of small business supporting mechanisms;
- high cost of rent and utilities;
- low purchasing power of the population;
- lack of / or limited access to financial resources;
- high interest rates for credits.

Most of these issues require urgent changes in the law of the country as the current legislative system stunts industrial growth and increases the discontent of the population.

First of all, laws and regulations supporting and protecting small businesses should be adopted. There must be accessible credit resources and utility subsidies. Also, it would be useful to develop governmental programs and create favorable business environment to attract foreign investors.

To ensure business operation in a suitable environment, stable tax policy is required. Entrepreneurs cannot react to everyday changes in laws so they need a strict list of rules and requirements, otherwise they will not be able to pay taxes properly and it will have a negative impact on the governmental resources. Laws should be favorable not only for big business and governmental projects but for small business as well.

Then, banking reform must be implemented in order to make credits cheaper and money more accessible for business. Inaccessibility of financial resources constantly slows down the development of small business. A system of cashless payment should be developed to make purchases easier both for customers and employees. It will also simplify accounting for entrepreneurs.

These changes will promote formation and growth of many small companies and raise their profit. An increased number of small companies will contribute to higher GPD and more working places in the country that will result in higher level of life and more attractive environment for foreign investors.

Hanna Hlukhova

J.O.Volotkovska, research supervisor

V. V. Hubkina, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

The Cultural Environment of International Business

The meaning of culture is defined in international relations as a “collective mental programming” of people. The “software of mind” differentiates us from other groups and shapes our behavior. It should be noted that most international cultures not only differ but are similar as well. The culture evolves within each society to characterize people and distinguish them from others.

Firstly, it captures how the members of the society live, for instance, how they feed, clothe, and shelter themselves, secondly, it explains how members behave towards each other and communicate with other groups. Also it defines the beliefs, values of members and set the way of perceiving the meaning of life.

The process of adjusting and adapting to a culture other than one’s own is called acculturation. Culture signals the differences among societies on the basis of language, habits, customs, and modes of thought more than any other feature of human civilization. Most of us are not completely aware of how culture affects our behavior until we come into contact with people from other cultures.

Cultural issues mean a lot for International Business, because effective handling of the cross-cultural interface is a critical source of a firm’s competitive advantage. That is why the managers are required to develop not only empathy and tolerance toward cultural differences but also obtain a sufficient degree of factual knowledge about the beliefs and values of foreign counterparts. Cross-cultural proficiency is paramount in many managerial tasks, including: developing products and services, communicating and interacting with foreign business partners, screening and selecting foreign distributors and other business party sides. In addition, intercultural features affect on negotiating and structuring international business ventures, interacting with current and potential customers from abroad, establishing overseas trade fairs and exhibitions and developing advertising and promotional materials.

All challenges and differences in national culture having great impact on cross-border business people cannot attribute only to cultural features. Employees are socialized into three cultures: national, professional and corporate ones. Working effectively within these overlapping cultures is a major challenge. The influence of professional and corporate culture tends to grow as people are socialized into a profession and workplace.

Most companies have a distinctive set of norms, values, beliefs, and modes of behavior that distinguish them from other organizations. The corporate culture is influenced by the age of a company and its product portfolio. Such differences are often as distinctive as the national culture.

Cultural layers present another challenge for the manager: to what extent is a particular behavior attributable to national culture? In companies with a strong organizational culture, it is hard to determine where the corporate influence begins and the national influence ends.

In conclusion I would like to add that respect for representatives of different cultures is an indispensable condition for strong and productive work in the team. In their turn the employees must be flexible and able to adapt to any challenging conditions. It is vitally important to follow the stream and be open-minded to any changes.

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Rodion Horbunov

D.V. Kabachenko, research supervisor

N.V. Poperechna, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Bitcoin: Opportunities and Threats for Ukraine

The information technology world is constantly evolving. And Bitcoin has become one of the greatest innovations in economic decentralization since the late 20th century. Bitcoin is the first decentralized digital currency, which can be used through the Internet.

Every country should decide what Bitcoin means for them: possibility or threat.

First of all, Bitcoin has significant advantages for investors, companies, employers and employees, they are: solution of the problem of assets centralized nature; bilateral dealing system; it is not affected by inflation; geographic independence for transactions; transparency of bitcoin processes; comparative safety of cryptocurrency wallets; transaction fees and time level in comparison to SWIFT or SEPA; solution of the "double spending problem" of electronic currencies.

The possible advantage for the country in case of bitcoin legalization is new business activity and new tax registration. It is important to notice that cryptocurrencies were created to be uncontrolled by any financial institutions. So the superfluous interference of the government can have detrimental effect on the development of this type of currency as a way of effective payment and accumulation facility.

However, Bitcoin has some disadvantages: lack of awareness and understanding for society; risk and volatility caused by limited amount of coins and high demand; complexity and cost of cryptocurrency mining.

The main threats of bitcoin distribution in Ukraine are: reduction of the state control over currency transactions and decrease of the importance of the existing currency circulation system in settlements between counterparties for goods delivered and services performed.

Bitcoin is the most popular cryptocurrency in the modern world, but, despite the achieved heights, it is in the phase of development and constant improvement.

Considering the facts above, we can draw the following conclusion: the importance of bitcoin should not be underestimated for Ukraine with its developed shadow economy and instability in the east of the country. This can lead to the even greater share of shadow market and reduction of legalized transactions in the field of international payments.

A careful study of the currency features and analysis of its advantages and disadvantages allow to conclude that it is impossible to effectively combat the expansion and development of the cryptocurrency in the world economy. Therefore, it is advisable to take it for granted and to take the process of its development under control by adopting appropriate legislative framework and establishing the main directions for its using in the national economy.

Mykola Kolesnik
S.O. Herashchenko, research supervisor
O.V. Khazova, language adviser
National TU «Dnipro Polytechnic», Dnipro, Ukraine

Shadow economy in Ukraine: ways of overcoming

The burning problem of Ukrainian business today is the proliferation of the shadow economy, which covers all areas of business life, because every year new methods and schemes of creating non-declared capital are invented. Ignoring this contradictory and multifaceted phenomenon causes serious errors in determining the macroeconomic indicators and results in inadequate assessment of the most important economic and social processes and trends, tactical and strategic mistakes in decisions making.

Fighting the shadow economy and corruption has to be complex and of vital national interest. However, the current methods remain fragmented and not complex. They are mostly limited to punitive sanctions for violating the terms of the ban.

In Ukraine, it is the responsibility of the government authorities to overcome the manifestations of the "shadow economy". But we can often see incoherence in the work of these agencies with the duplication of the administrative functions. Therefore, it allows "shadow" businesses to develop their criminal activity. Underground economic relationships are gradually evolving, being softened or even legalized in some cases.

The consequences of the "shadow economy" include:

- total criminalization of the country and society
- deformation of the tax system
- significant decrease in the efficiency of macroeconomic regulation
- growth of investment risks and worsening the investment climate.

Under these circumstances, it is important to create a special state body which could control the situation with the illicit economy and interact with all other government agencies and foreign bodies. This agency must have broad rights and perform the following functions: accumulation, analysis, prevention, investigation and prosecution of illegal business. To facilitate its work, it is necessary to create and introduce the electronic database, which would contain information about dishonest taxpayers, as well as financial and economic activity of enterprises and individuals, with the possibility of further data exchange between the state bodies in case of suspicious transactions.

In result, overcoming the illegal business activity will stimulate further development of the national economy and society. Being legal and bound to the law, the country economy can tremendously increase its potential and become effective. In the opposite case, the economy of Ukraine will follow the Latin American way of development with a predominance of narrow-clan interests, being beyond the reach of the law, that will lead the population of the country to poverty.

Vitaliia Kurylo

M.S. Pashkevych, research supervisor

N.M. Nechai, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Tax on entrepreneurship across countries

Entrepreneurship is a capacity and willingness to develop, organize and manage a business venture along with any of its risks in order to make a profit. The most obvious example of entrepreneurship is the starting of new business. In economics, entrepreneurship combined with land, labor, natural resources and capital can produce profit [1]. Entrepreneurship is an integral part of a country's economy. The more entrepreneurs and companies registered in the country, the more jobs and cash flows from taxes go to the government budget in this country. And the more money is in the state budget, the higher a quality of life is in this country.

A tax is a compulsory monetary contribution to the state's revenue, assessed and imposed by a government on the activities, employment, expenditure, income, occupation, privilege, property, etc., of individuals and organizations [1]. Taxation is a complex system in every country. It is important, because taxation takes part in the regulation of money in the domestic economy of the country.

Each government establishes its own tax rates for entrepreneurship and its profits. The desire of individuals to do business in each country is directly dependent on the size of tax rates. Let's consider corporate tax rates in different countries of the world.

Worldwide average tax rate is 22,96%. Europe has the lowest regional average rate, at 18,35%. Corporate tax rate in Ukraine is 18,00%. Africa and South Africa tie for the highest regional average statutory rate, at 28,73%. United Arab Emirates have the highest rate – 55,00% [2]. As a rule, the highest corporate taxes are in the richest and more developed countries, for example, the United Arab Emirates, the United States. We can see difference of tax rates in countries of the world in this diagram:

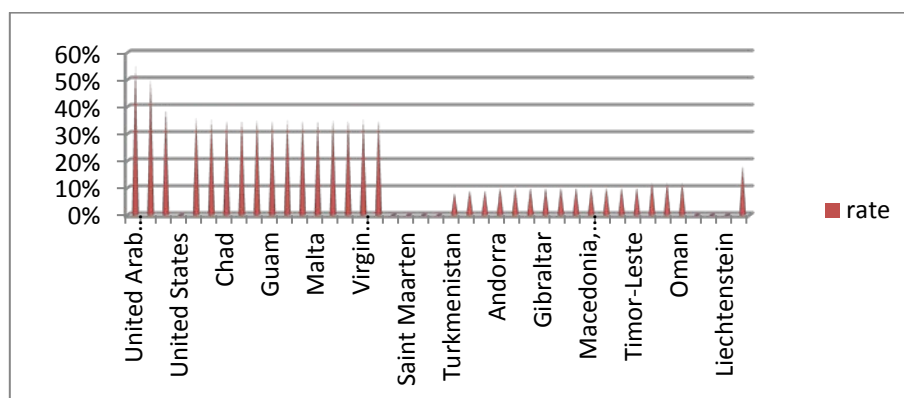


Fig. “Tax rates across countries”

We can see here that Ukraine has a middle tax rate if we compare it with all countries in the world. But if we compare it with European countries, we can see that Ukraine has one of the lowest tax rates. Many of the developed states in Europe have higher rates. For example, corporate tax in Germany is 30,00%, in France it is 33,00%, in Belgium – 29,00%. Switzerland has the same with Ukraine tax rate – 18,00%. The question is why our country has such a weak economy. A possible answer is that we have a complicated tax system, many nuances, which are so important to develop in business. As the result many of our entrepreneurs register their business abroad and pay taxes to budgets of other countries, small and medium businesses are not supported by our state, only monopolistic business can develop, get subsidies etc. So, Ukrainian economy system is imperfect and does not provide an opportunity to start and develop a business.

There are countries in the world without any general corporate income tax. Such countries are called offshore zones. Offshore companies pay a fixed fee to the government for registration and continuation of the license for activities, as a rule that fee does not exceed \$1,000 per year. People register their companies in such countries for two reasons: first – to get the maximum profit, not paying taxes to their states (mainly it is so-called “shadow” structures), second –to make ends meet. In both cases people who establish these offshore companies hide incomes and taxes from their state and as a result do not replenish the state budget and prevent it from developing. Tax Foundation made a list of countries without any general corporate income tax. They are Anguilla, Bahamas, Bahrain, Bermuda, Cayman Islands, Guernsey, Isle of Man, Jersey, Maldives, Nauru, Palau, Turks and Caicos Islands, Vanuatu, Virgin Islands (Britain) [3]. Some of these countries developed thanks to offshore money of foreign investors.

As we can see, a tax system is a complex mechanism which significantly influences the national economy and our everyday life. Every state is dependent on entrepreneurship money. Every state chooses its own way of development, establishes its tax rates, chooses to help new companies and businesses or not. In turn, entrepreneurs choose to pay taxes to their states or to register their business in other states with lower tax rates. Real examples of corporate tax sizes show us that different governments have different views on tax problem. Ukraine has one of the lowest tax rates in Europe, but its economic system is so imperfect.

In my point of view, government of Ukraine can adopt a law that forbid to register a business operating in Ukraine in other countries; can give more subsidies to small and medium businesses, support them, simplify the tax system. Then our entrepreneurs will be able to produce more Ukrainian goods for domestic sale and for export. I think, that these measures can help to raise the Ukrainian economy to a new level.

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Gleb Naydenov

A.G. Vagonova, research supervisor

V.O. Lapina, language advisor

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Financial Security of Enterprise

With the increase of the degree of Ukrainian economy's openness, great competition in the world market, the emergence of new spheres of production and accelerated development of computer technology against the background of the Ukrainian economy's weakening, the problems of ensuring financial and economic security of both the country and individual industries, sectors and business entities are becoming more and more actual.

The definition of the concept "financial security" in scientific sources is interpreted as the degree of financial interests' protection and as a certain financial state. Definition of financial security as a degree of financial interests' protection greatly reduces the feeling of financial security, because protection of financial interests is more appropriate to define as one of the tasks of financial security. For example, V. L. Bezbozniy notes that financial security is a degree of financial interests' protection of all external environment actors involved in its activities and employees of the enterprise; sufficient level of financial resources for the processes to meet the enterprise's needs and all its related entities. According to A. M. Gumenyuk, financial security is a risk management activity and protects the interests of the enterprise from external and internal threats in order to ensure a sustainable development of the enterprise and the growth of its own capital in the current and strategic perspective.

The consideration of financial security as a balanced state of certain systems also constricts the notion of financial security because the balanced state of a certain system is appropriate to define as the ultimate goal of the financial security system functioning. A similar approach is used in the definition of financial security as a state of using corporate resources. Y. V. Goncharov notes that financial security is a state of financial, monetary, currency, banking, budget, tax system, that is characterized by a balance, resistance to internal and external negative influences, the ability to ensure the effective functioning of the national economic systems. V. V. Krutov indicates that financial security is a state of the country's financial and credit sector characterized by resistance to external and internal threats, as well as the ability to ensure sustainable economic development of the state. According to V. Y. Nusinova, financial security is a state of the most effective use of information, financial indicators, liquidity and solvency, profitability of capital that is located in networks of its limit values.

After reviewing the main components of financial security, it can be concluded that the basis of the financial stability of any organization is an effective mechanism of the financial security system's management.

Valeriia Novykova

O.R. Mamaikin, scientific supervisor

I.A. Ivanchenko, language advisor

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Brief information about diversification of production

Diversification of production is the simultaneous development of many unrelated types of production, the expansion of the range of manufactured products within a single enterprise, concern and the like. Diversification is used to improve production efficiency, obtain economic benefits and prevent bankruptcy.

The main idea is that if one of the lines of business is unprofitable, the company will stay remain on top for successful results in another industry.

The enterprise is considered diversified if the share of production of non-target products exceeds 30%. The main objectives of production diversification are to minimize production risks, to develop a new type of product, to distribute assets between different industries, to enter new markets, to search for potential investors.

The main advantage of diversification lies in obtaining the maximum economic benefit from all sorts of diversity. In other words, more profitable and competitive in the market will be an enterprise that produces several types of products at once, rather than one, but popular. At the same time, the effect is achieved through: the multi-purpose use of all available resources; building an effective sales network for goods and services; versatile training and staff training.

There are two main types of production diversification: connected and unrelated. Connected diversification implies that the firm does not go far beyond its core business. This type is preferred for small enterprises that do not have sufficient working capital for serious re-equipment for the production of other products. Unrelated diversification implies the release of a completely new product. In this case, there is a way out to a completely unfamiliar market with a brand that is associated with another industry.

Forms of diversification of production can be defensive or offensive. The first form is "expansion", which is focused on the rapid seizure of new markets. This is an aggressively offensive strategy, which often brings instant results. Its essence consists in the absorption of one enterprise by another.

The second form is called "replacement" and it is a defensive strategy. It implies that the company removes products that could not stand competition, and introduces a new product in its place.

The next form of diversification is "deployment", which is offensive. It implies that the company begins to saturate the market on which it conducts successful activity by new products that are targeted at different target groups.

The last form "coagulation" refers to an over-the-counter strategy. This form implies the complete refusal of the firm to produce unprofitable products and transfer of freed up capacities to more successful industries.

Diversification is divided into horizontal and vertical. Vertical diversification implies a firm's transition to output from the previous or subsequent branch of the technological process. The horizontal diversification of production implies the development of new products at the same stage of the technological process.

All concerns and corporations are diversified enterprises. For small companies, it is difficult to independently survive under the influence of various economic factors, so they often seek to enlist the support of the largest players in the market.

The diversification strategy is a marketing action that allows the company to discover new promising directions for business that are different from the current production line. The main idea of the strategy is to redistribute funds and capital between different types of activities, which significantly reduces the risks of enterprise bankruptcy.

Among the existing strategies, there are three main types: conglomerate, centered, horizontal.

The strategy of conglomerative diversification is a process that seeks to start the production of goods and services, which are not related to the main products and their markets. This strategy is one of the most complex of all today. It depends on many surrounding factors, including the skills of managers and ordinary employees, the necessary funds and seasonal economic changes in the market. Opposite this strategy is a concentric diversification strategy, in which a new product is produced, which is technologically and technically identical to the existing one at the moment. Its role is to attract customers from different social resources.

The strategy of centered diversification is to find new technological opportunities on the basis of already existing technological processes and lines, as well as the main products. This strategy is to provide new production lines solely on the basis of the achievements of goods or services. At the same time, this part of the business develops and functions separately from the main portfolio.

The strategy of horizontal diversification implies the growth of the company's finances through the creation of a new product that requires new technologies that are not similar to the previous ones. With this strategy, the company creates technologically unrelated products, for which implementation existing tools can be used (for example, in logistics or wholesale sales). This strategy provides for the creation of products that must be consumed by the main products or become its accompanying part.

The development of a business diversification strategy can be both the best way to solve the company's financial problems and enable it to manage all kinds of risks in the company's business. However, the economic growth of the enterprise is possible only if the company is properly diversified.

Diversification of production is a strategic reorientation of the enterprise's activity towards expanding the number of types of products and expanding sales markets. Its main idea is to provide the company with stability on the market in the event that one of the directions of production becomes unprofitable, at the expense of other production lines. Often, in this process, a unique technology, process or product may arise.

In the new conditions for reforming managerial functions, decision-making mechanisms, the ratio of economic and administrative methods of managing the diversification process, are changing.

With the help of administrative methods, local governments regulate privatization processes, solve issues of using natural resources, and attract foreign capital.

The essence of economic methods is the indirect effect on the effectiveness of diversification through the economic interests of the actors with the help of such levers as taxes, credits, subventions, subsidies, etc. in the statutory framework.

At the heart of economic market methods of regulation are economic interest and responsibility of enterprises-subjects of territorial reproduction (or their owners) for the consequences of decisions made on diversification of production and entrepreneurial activity, the fulfillment of the tasks of the complex socio-economic development of the region.

Diversification in the mining complex should combine the internal interests of the enterprise with the interests of the region in order to ensure energy independence or its increase, creating new jobs, preserving the city-forming mining enterprises, and reducing the burden on the environment in the region.

Maria Pereverzeva

E.Y. Churikanova, research supervisor

N.V. Poperechna, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Conducting Business in a Booming World

In a world of rapidly changing technologies and developed economy, one must make every effort to maintain their business and bring it to a high level. That is why it is very important to understand and know how to manage a business in a fast-paced world.

The problem of conducting business is relevant, because to achieve results in business it is necessary to introduce innovations and change management, otherwise it will be difficult to survive in a rapidly moving world.

The Internet environment has significantly changed business processes nowadays and the structure of business is appeared to be one of the biggest fields of change. Change management is an ever-changing area of study. As the business environment continues to evolve and change, companies will need to be able to successfully implement changes. The key objective of any change management program is to involve strong leaders within the company in planning and implementing the change, and operating after the change.

One of the main aspects is taxation of e-commerce start-up as an important part of conducting business, and for establishing a stable e-Commerce business it is essential to understand the nature of business. The main aspects can be broadly classified into 3 categories: E-Advertising; E-Sales and E-Delivery. Concerning the transactions in an e-Commerce business they are generally automated and conducted without human involvement (even the Permanent Establishment of the e-Commerce company performs its primary business functions in an automated environment).

There are four best ways to manage business. The first one is to pay attention to video marketing, where the primary characteristic of conducting business using video marketing is described because now it is becoming a powerful online marketing strategy for promoting products and services.

Secondly it is important to pay attention to personal liability: if you are planning to start a business or protect investments you have several options in the type of entity you can form. The third way to manage a business is to avoid working with the wrong people. Today's business needs someone who performs effectively, demonstrates a commitment to the organization and its mission, and accepts, supports, and contributes to the unique business culture. The fourth way is protecting the business from hackers. The cyber attacks can happen to any business, so providing adequate protection for your business is a reliable way of keeping business afloat.

As a result, we can draw a conclusion that using these four ways of managing business will help to bring business to a new level.

Olena Pylypenko

A. I. Ignatyuk, Doctor of Economics, Prof., research supervisor

N. M. Semeniuhina, language adviser

Taras Shevchenko National University of Kyiv, Ukraine

Behavioral Economics as a Modern Direction of Economic Research

Richard H. Thaler, the American scientist, became the Nobel Prize laureate for Economics in 2017 for his contribution to the study of behavioral economics. In his writings, the scholar analyzed the influence of such factors as limited rationality, social advantages and the lack of self-control from individual participants in a market economy on individual decisions and general outcomes of market functioning. It should be noted that R. H. Thaler is not the first Nobel Prize winner in this field of Economics. In 2002 it was received by Americans D. Kaneman and V. Smith. Actually Daniel Kaneman is considered to be the founder of behavioral economics. He, along with his colleague Amos Tverski, laid the foundations for understanding universal mistakes arising from stereotypes and biases, and developed a theory of perspectives (1979).

The main subject of the theory of perspectives research is the influence of psychology on making economic decisions and the correspondence of such psychological principles as dependence on comparison (there is a "line of comparison" in human consciousness), avoidance of losses (we are more sensitive to losses than to achievements of the same size), nonlinear weighing of probability (usually a person overestimates a small one and underestimates a high probability).

The theory of prospects has become one of the areas of the general behavioral economics - the area of Economics, which studies the influence of psychological, social and emotional factors on the decisions of people in various economic situations. It studies the process of making market decisions as well as an analysis of the mechanisms of public choice.

The key principles of the study of behavioral economics are the following methodological techniques: heuristics (is based on the fact that people often build decisions on a rough estimate, rather than rigid logic); a frame (a set of anecdotal evidence and stereotypes that comprise mental emotional filters); market inefficiencies (wrong pricing and inappropriate decision-making).

From a practical point of view, behavioral economics explicitly takes the psychological features of human perception, judgment and action into account. We make irrational decisions, but they are predictable. And the knowledge of the comparison mechanism used by our brain helps to predict them. Graphic confirmation of the relativity of our perception is shown in Fig. 1. The black circles are the same size, but the one that is surrounded by big ones seems smaller than the one that is surrounded by small circles.

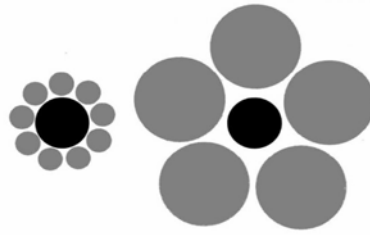


Fig. 1 Relation of human perception of reality.

How does the behavioral economics work in our lives?

Let's consider three situations with which, apparently, everyone encountered, and analyze the most probable actions on its part.

1. The effect of possession. You are a long-time fan of the American rock band Rolling Stones. The group arrives in Kiev and you have a ticket for 1000 UAH, for which you would not hesitate to pay even 3000 UAH. At the same time, you read on the forum that tickets are no longer available and some people are ready to buy the ticket for 10 thousand UAH.

Being a prominent fan of a group, will you sell it or not?

From the point of view of classical economic theory, it would be rational to sell this ticket and earn revenue. But the behavioral economy gives the opposite conclusion. If you are the same as most viewers of full-length concerts, then you will not sell this ticket for nothing.

2. An imaginary account. You need to buy a case for a mobile phone for 200 UAH. Exactly the same can be bought in the store in 10 minutes on foot for 150 UAH. And now imagine that you need to buy a more expensive case for 1000 UAH and the seller tells you about identical conditions: a store in 10 minutes and a discount of 50 UAH.

Will you agree? Most people are ready to go or go to another store for a discount for a cheaper cover, but refuses for the same discount for a more expensive thing.

3. Failure to accept losses. You are offered a game of throwing a coin. If you run out of money, you lose \$100. If you fall an eagle, you win \$150.

Will you agree to participate? To make a decision, you must weigh the psychological profit from receiving \$150 and the psychological cost of \$100 loss. What do you feel? Although the expected value of the game is positive, since you can win more than lose, you will most likely refuse – like most people.

Thus, the behavioral economy is a direction of economic theory, which is very closely related to psychology, since it deals with the study of the influence of psychological factors on the decision of people in various economic situations. This science studies the impact of psychological, social, cognitive, and emotional factors on the economic decisions of individuals and institutions and the consequences of such decisions for market prices, profits, and resource allocation. Much attention is paid to situations where people behave differently than the classical economic theory predicts with its assumption of rationality and selfishness.

Diana Pivniak

G.M.Pylypenko, research supervisor

O.V. Khazova, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Challenges of modern Ukrainian economy

Modern economy has a variety of fundamental economic issues to deal with. One of the central problems that Ukrainian economy faces every day is the discrepancy of needs and opportunities. And this problem affects both a poor student and an oligarch. But needs and opportunities are very different and needs usually prevail. What is more, the society often encounters the lack of resources such as money, time, skills, talents, etc. to meet the needs.

The main reason explaining why modern Ukrainian society cannot overcome the problem with the resource lack is oligarchic system of social and economic relations, which originated in the 90's and reached its peak at present. This system was created for strengthening the positions of the representatives of the highest echelon of the Ukrainian government and significantly enriched the narrow circle of businessmen. Subsequently, this system mutated from an oligarchic to an even more regressive oligarchic-bureaucratic model of governance where almost all the representatives of the administrative authorities are either direct protégés of oligarchic-financial groups or these groups control and manage them.

Another problem in the Ukrainian economy is the currency depreciation. Even the beginning of the year 2018 was not without regular financial surprises in Ukraine. In early January the hryvnia had dropped by 10% to 25 UAH/\$. By January 26 it reached 26.7 UAH. The US dollar disappeared in almost all currency exchange offices that was explained by the fact that the currency during the rate increase goes to the "black" bourse.

There are several reasons of the currency depreciation. Firstly, the pace of global economic development as a whole has slowed down. Therefore, the demand for the commodity groups typical for Ukraine such as grains, metals and chemicals has decreased. Secondly, all foreign banks working in Ukraine have started to convert their savings into hard currency and thus they provoked a strong demand for it. The third reason is uncertainty with the IMF cooperation. According to the agreement with the International Monetary Fund, 1.7 billion dollars were promised to be lent to Ukraine, and soon could be delivered to Ukraine's foreign exchange reserves. However, Ukraine already has an external debt of \$100 billion because of external loans of 2006-2008, as well as a debt to Russia that has reached the amount of \$ 3 billion. So, experts think that the situation in the Ukrainian exchange market will change as soon as the government solves all the problems with debts, resumes cooperation with the IMF and carries out radical reforms. In addition, solving the conflict with Donbass can be another positive moment for rehabilitation of the Ukrainian economy as well as political stability of the country. Because very few investors want to invest in a country where the war is going on.

Katerina Rusakova

T. V. Gerasimenko, research supervisor

L. A. Zaika, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Profitability Analysis of the Enterprise

Products produced by the company, provided that they are sold to the consumer, become a commodity. It is at the stage of sale when the value of a product is included, which includes the cost of past labor and living labor. The cost of living labor reflects the newly created cost and falls into two parts: the first represents the wages of employees who took part in the process of production. Its size is determined by a number of factors due to the need to reproduce the workforce, and it represents a share of production costs. The second one reflects the net profit that is realized as a result of sales of products and at the enterprise level takes the form of profit.

Profit is one form of cost of an additional product that serves as the difference between the sales price of the product and the cost of its reproduction, the source of budget revenues, the financing of expanded reproduction and the promotion of employees. Profit is the main indicator of economic efficiency.

In the commodity market enterprises act as relatively separate commodity producers that sell products to the consumer making profit. To reveal the financial result from the sale of products, it is necessary to compare the gross income with the gross expenses for production and turnover, which take the form of the cost of production. When the gross income exceeds the expense, the financial result indicates a profit.

There are several functions of profit: the estimation function reflects the effect of using the company's main resources; the stimulating function of profit is aimed at reducing production costs by introducing innovations, which increases the possibilities of increasing production and increasing the scale of business; the function of economic calculation shows that the company's revenues can not only cover the costs but also the reserve; the distribution function provides the choice of entrepreneurial activity among alternatives; the indicative function of profit provides the enterprise with information about the assessment of its activities and the market's fullness of goods, giving an economic signal of the need to increase or decrease production volumes; reproductive function serves as a source of expanded reproduction of fixed and working capital of the enterprise.

There are several types of profit: gross profit, standard income, operating, financial and investment income, profit from ordinary activities, profit from extraordinary activities, taxed profits, net profit.

Gross profit, P_g , is calculated as the difference between net income (revenue) and the cost price of sold products:

$$P_g = NP - C_z$$

P_g – net income (revenue); C_z – entrepreneurial cost of production; NP – net profit.

Normative profit, P_n , is a part of the net income from the main activity, which remains after deduction of expenses for its realization.

$$P_n = NP - C_k = NI - (C_z + E_s)$$

C_k – commercial cost; E_s – expenses for the sale of products.

Normative income is calculated when planning the company's activities for the next year, therefore, it is defined as the minimum amount of profit when a company can survive under market conditions, to ensure its financial stability, maintaining the necessary level of competitiveness. Can be calculated by the formula:

$$P_n = \frac{K \times R_K}{100 - T_{pr}}$$

K – value of own capital; R_K – return on equity; T_{pr} – tax rate.

Operating profit, P_o , is defined as the algebraic sum of gross profit, other operating activities, administrative expenses, expenses on sales of products and other operating expenses. Profit from investing activities is the profit that investor receives from investing in any assets of an enterprise that is not part of the equivalent cash (reconstruction, new construction). Profit from financial activities is the profit from placement and turnover of securities (dividends, interest). Profit from ordinary activities (financial result before taxation) is an algebraic sum of all types of entrepreneurial activity. Net profit, NP, is a part of the profit from all activities remaining after tax and after adding the amount of income tax revenue.

Each company should provide for planned measures to increase profits. In general, these measures may be of the following nature: increase in output; improvement of product quality; the sale of surplus equipment and other property or leasing it; lower cost of production at the expense of more rational use of material resources, production capacities and areas, labor and working time; diversification of production; expansion of the sales market, etc. From this list of measures follows that they are closely linked with other measures at the enterprise, aimed at reducing production costs, improving product quality and the use of factors of production.

Despite the fact that profit is the most important economic indicator of the company, it does not characterize the effectiveness of its work. It is necessary to compare the results (in this case, profit) with the costs or resources that provided these results to determine the efficiency of an enterprise.

Thus, profit characterizes the financial result of the entrepreneurial activity of the economic entity. Profit serves as an indicator that most fully reflects the efficiency of production, the volume and quality of manufactured products, the state of labor productivity and the level of cost. Profit, on the one hand, is a financial result, one of the main indicators of the evaluation of the enterprise, and on the other – the main source of own financial resources of the enterprise, which really provides the principle of self-financing. At the expense of profits, funding is being made for scientific, technical and socio-economic development of enterprises and an increase in the wage fund of their employees. Finally, profit is one of the sources of budget formation and extra budgetary funds. It enters the budget in the form of taxes and along with other revenue streams is used to finance public consumption.

Daria Savchuk

S.O. Herashchenko, research supervisor

O.V. Khazova, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Methods of competitive recovery

It is impossible to achieve a durable success under market conditions unless:

- effective business development strategy is planned;
- information about company prospects, opportunities and competitiveness, the status of the target market is constantly analyzed.

Competitiveness is a relative characteristic describing the difference between a company and its competitors in a particular field of production. A company is highly competitive if it meets the quality standards at competitive prices and consumers are ready to buy this company product again and again.

Economic agents should strive to improve their competitiveness by using specific competitive practices. These methods can be classified as non-price, price, unfair and fair. The main tool of price methods is product value. It is a struggle for the reduction of production costs by the use of scientific and technical innovations, improving workplace management, increasing productivity, etc. According to the forms and purposes of competition, monopolistically high, monopolistically low, dumping, and discriminatory types of prices can be set. Non-price competition is aimed at creating the preconditions that will improve sales. So, in this case, a firm primarily cares about meeting consumer demands while developing strategy and tactics of its market behavior. Unfair competition deals with the violation of current legislation, ethical, professional, moral norms and rules of conduct in order to achieve improper advantages in competition.

Therefore, promotion of competitiveness is connected with the improvement of development, production, sale and maintenance of products. The efforts should be directed at achieving such goals as improving the quality, reduction of production costs, improving the operational efficiency of the equipment, marketing development.

Porter's theory of competitive advantage considers two main sources of advantage: marketing and costs. Advantages in marketing are advantages in products and services that better meet consumer demands than competitor's products. Advantage in costs appears due to lower production and marketing costs which allow the company to reduce the price or use the savings on advertising and distribution.

So, to be competitive an enterprise should: 1) ensure its product higher quality at lower price in targeted market segments; 2) raise its competitive potential to the level of the manufacturers in the industry (this indicator determines the company successful in the future). A company must also consider such internal factors as financial conditions of the enterprise, effectiveness of marketing strategy, return on sales, company image (brand capital), and management efficiency.

To sum up, if a business efficiently uses its production, research and development, labor potential, and financial capacity, its effective disposal of goods and services will be an integrative indicator of company viability.

Natalie Zaiets

A. V. Dudnyk, research supervisor

O.V. Khazova, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Shadow economy

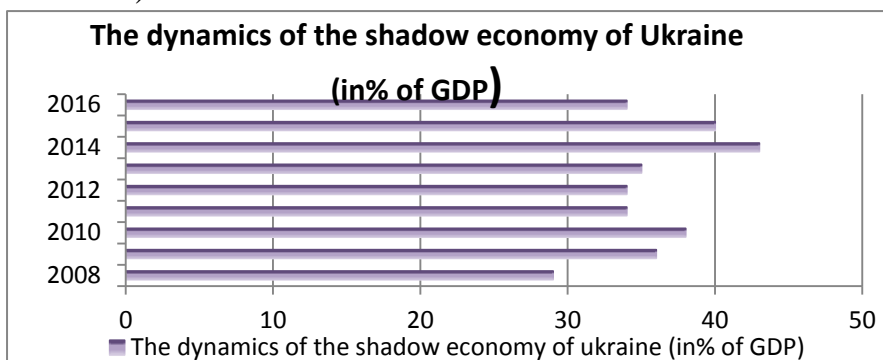
Shadow economy, which is an illegal economic activity developing out of state budgeting and control, is one of the largest barriers to economic development, welfare, level and quality of people's life as well as strengthening the national security of the state. The problem of shadowing exists in many countries of the world. However, this problem has a negative social and economic impact.

Economists identify the following types of the shadow economy:

- gray economy that includes legal economic activity where the production of goods and services is not revealed in the official statistics;
- illegal actions (bribery, speculative transactions and other types of fraud involving money receipt and transfer);
- underground economy (all types of economic activity prohibited by law).

The level of shadow economy directly depends on the economic prosperity, level of corruption, bureaucracy and social responsibility.

Ukraine's economy is characterized by a high level of shadowing (about 40% of GDP) that is demonstrated on the chart below.



In order to take the economy out of the shadow, coordinated actions of all legislative and executive branches of power are required. So, it is necessary to introduce a number of reforms that will include:

- legalization of the shadow sector;
- prohibition of shadowing;
- support to legally operating entrepreneurs;
- punishment for violation of the law;
- overcoming corruption.

The immediate actions should be aimed at improving the legislation because, first of all, the government should be interested in stimulating the economy get back from the shadow. The next step involves changing fiscal policy. It is also necessary to increase penalties for committing economic crimes. But these steps should be deliberate in order to encourage the existing shadow business to become legal.

However, the most important thing is the personal attitude of every citizen to the shadow economy. It must be treated as an abnormal functioning of society. But the way to achieving these changes in individuals' minds is overcoming the corruption in the country.

Section 02. Innovative Management

Dasha Boyko

Y.P. Pilova, research supervisor

V.O. Lapina, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

SEO Optimization

Today's Internet user is extremely spoiled and not used to spending a lot of time searching. If they do not find you, they turn to competitors, finding information about which will be easier and faster. This all leads to the loss of customers and the promotion of competitors' sites. It is obvious that for most internet companies, site optimization is a necessary and effective marketing tool.

Search engine optimization (SEO) is the process of affecting the online visibility of a website or a web page in a web search engine's unpaid results-often referred to as "natural", "organic", or "earned" results. SEO texts are classic optimized texts, often found on the pages of online stores. For example, descriptions of the sections of the catalogue in which the main key requests for promotion are "sewn up." Often such content is partially hidden from users, because the material isn't selling.

Search engine optimization is a very effective way of attracting customers, but with one caveat: professionals should perform it. Not so much that inept optimization can cost penalties to the site, but that the number of visitors to the site will increase, and the number of buyers will not. To promote the best result, you need to determine the list of promoted requests and the promotion strategy.

Search engines take into account a lot of internal and external site parameters when calculating its relevance: keyword density, citation index, text water content, etc. There are situations when the user has already chosen for himself several alternatives and is inclined to contact your company and the competing companies for more information. Then the user searches for sites or contacts of these organizations. In this situation, few will open a city telephone directory or call the information service to find out information. The majority will look for information on the Internet. If the site is not SEO-optimized, then the user, most likely, simply will not find information about the company on the Internet.

SEO is the main way to drive traffic to a site that exists since the creation of search engines. At each stage of its existence, SEO changes, adapts to new ranking algorithms, filters and factors.

Under the current conditions of competition and the complexity of the market, the promotion cannot do without the use of programs, services and assistants. Thus, search engine optimization will be in demand and necessary for all companies until people stop searching for information on the network.

Alisa Butenko

A.V.Dudnik, research supervisor

V. V. Hubkina, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

How Gender Diversity Makes Companies More Innovative and Successful

Have you ever thought about such aspect as controlling most of today's rather successful companies? Even if not, then you guess that most executives, top managers and company owners are males. And, it would seem that we are already living in the years of not such clear gender discrimination. But, unfortunately, this fact is not remained to be the true.

However, male managers are in vain to be kept so skeptical with regards to female executives, because a research conducted in Germany comprised the fact that each of the tested companies were asked only two questions: "How many women are involved in the company's management?" and "How much is the company innovative?". About 171 companies were involved in this research and it has proven that companies with at least one woman in the management are more innovative. Although, it is hard to understand whether the company is innovative due to women's leadership or vice versa. But, unfortunately, one woman can not change the situation. To improve the firm's position on the market about 20 percent or more women should be employed for management positions.

Women have a different vision of the world as they could see the prospects being neglected by men and would solve the task more easily using female intuition. And that could be explained taking into consideration biological and psychological differences between male and female. In spite of these obvious advantages, women are still underrepresented in corporate enterprises and are less likely to be promoted to manager positions. This results in much less number of women following the path to leadership and providing the opportunity to get top positions in management, administration and politics. Many graduates of higher education institutions, business schools are women who, as a rule, show better results in studying process. But being aware of the fact that in some cases excellent marks will not guarantee successful and much promising working place decreases the desire to overcome gender inequality in the management of the firm.

Fortunately, there are some indicators presenting the changes taking place in business world. Some companies are starting to launch programmes on sponsoring junior female managers and this kind of sponsorship represented as a structured form of support differs from mentorship having a form of occasional conversations and informal career advice. Current data definitely demonstrate that gender diversity results in better operational and financial performance and achieving this kind of success could happen in the case of joint efforts of both genders working for achieving the same goal as creating an equitable workplace.

Andrii Duiun

O.O.Novikova, research supervisor

O.V. Khazova, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Ukraine-Belgium freight transport logistics improvement

This publication describes the research of the freight transport logistics between Ukraine and Belgium. The calculations of the road transport vehicle capacity necessary to meet the freight market demands are based on the export data between Ukraine and Belgium in 2013-2017. The data about the export volume are received with help of the regression analysis.

First, it was found out that 3147 round trips are required to transport 62930 tons of cargo between Ukraine and Belgium over a distance of 4960 km. Each round trip takes 15 days.

The next step involved the analysis of cargo types with relation to the technological and freight transport logistics peculiarities, specific requirements for vehicles, and transportation and cargo safety demands. The type of cargo that is vulnerable to atmospheric influence and can be transported only in the covered trucks has been taken for further consideration as this cargo type share is the biggest in the total amount.

Taking into account the nature of transportation, vehicle technical characteristics, the cost of technical service, and vehicle compliance with the international standards, the decision to use a heavy truck Volvo FH12D12C420i and a semi-trailer Kogel S24-1 was made. To minimize the risk of downtime because of unstable demand during a year, the optimal number of 56 vehicle units has been identified taking into consideration a maximum annual profit of 803846 UAH.

The total cost of an international round trip counted for 205006,167 UAH in 2017 and included payments for driver, benefit-related deduction, fuel and lubricant costs, operation costs, costs of maintenance, cost of car tires, amortization, etc. The optimal travel cost per km was 56,43 UAH/km and transport work rate - 2,25 UAH/tkm (tonne - km)

According to the freight transport logistics arrangements and the international agreement on the driver mode of operation and work on vehicles with trailers or semi-trailers, the “relay” method of transportation with three drivers has been chosen as the most productive and cost efficient. In this case the drivers can meet the requirements for safety which prescribe that crew members must change each other after 450 km with each person minimum daily rest period of 11 hours. If a vehicle is not equipped with the sleeping space, each driver must have a daily rest of 10 consecutive hours within the 27 hour period. If a truck has sleeping facilities, the drivers should have at least 8 hour daily rest within the 30 hour period outside the vehicle or in the vehicle when it is stationary.

All the calculations are effective for the period of 2017 and should be modified according to price and cost fluctuations in the future.

Katherine Feshchenko
A.V. Bardas, research supervisor
O.V. Khazova, language adviser
National TU «Dnipro Polytechnic», Dnipro, Ukraine

Gender differences in the global mindset

The problem of gender differences in leadership styles and organizational effectiveness has become of great interest for many scientists in psychology, management and sociology since women began to hold more leadership positions. So, the issues of the organizational effect of various types of leadership and the influence of masculine and feminine leadership styles on business effectiveness are the focus of this report.

In the traditional society, leaders mainly used to be males. The assumption that leadership equates with maleness is deeply embedded in our thinking and language. Leaders are often described as “competitive”, “aggressive” or “dominant”, which is typically associated with masculinity [1]. Indeed, Gender Role Theory [2] proposes some social role expectations and people’s perceptions of how men and women ought to behave in the workplace. For example, “men are considered more leader-like, intellectual, analytical, able to think abstractly, and able to solve problems, whereas women are considered kinder, warmer, more expressive, more supportive, and gentler” [2]. So, it is obvious that men and women differ in a range of competencies, characteristics, and styles related to leadership.

AMJ researches show that women demonstrate specific features of the global mindset such as intercultural empathy, diplomacy and passion for diversity. First, women have been found to be more interested in friendship and community, they are generally more empathetic, better able to manage sensitive relationships and have higher emotional intelligence than men. Therefore, it is plausible to expect that women will show a higher level of intercultural empathy. Second, women are more collaborative, team-oriented, participative, socially facilitative, and show stronger self-efficacy in diplomacy [3]. Su, Rounds, and Armstrong [6] emphasize that women prefer working with other people, whereas men prefer working with things and gadgets or being outdoors. Third, women’s genuine interest in individualized consideration, friendship, and community, their excellent people skills may explain why women have been credited with boundary-spanning and bringing international diversity to their corporate boards [3]. *Organizational culture* is another important factor in leadership. Corporate climate is the atmosphere of an enterprise which reflects the way of interaction between people within the organization. Women tend to create company cultures oriented towards human relations and ensuring equality of employees. It is based on the idea that a company is a place for self-realization, development of talent and self-expression [4].

On the other hand, various researches on gender differences show that men are better at global business savvy, cosmopolitan outlook, and interpersonal impact. Moreover, men have been found to be more effective and willing negotiators, to have better access to social network, and to spend more time building broader professional

networks because they are more active and engaged and have greater exposure than women. Thus, it is plausible to expect that men can show higher levels of self-efficacy in terms of interpersonal impact i.e. the ability to negotiate effectively and to build global networks. It also comprises experience in negotiating contracts and agreements with people from other countries, strong networks with influential people from other cultures, and one's reputation as a leader [3].

To sum up, both leadership styles have benefits and limitations depending on the working environment. The feminine leadership style is more effective in people-centered environments which are becoming more popular today (e.g. "family culture" and "incubator" types of organizations). Their natural inclination to support subordinates' personal growth and emphasize open communication helps create comfortable work atmosphere and achieve exceptional results. The masculine leadership style offers more autonomy for subordinates, that is good for independent and creative people who do not prefer to be frequently interrupted or forced to work under supervision [5]. However, we need to get away from thinking about one perfect style of leadership. As Epstein writes: *"It is up to the leaders of business to affirm the humanitarian values that women are associated with but that men can (and do) express if they are not made to feel embarrassed about showing them. And those qualities of toughness and drive that men are made to feel comfortable with should be prized in women who wish to express them when they are appropriate"* [1]. So, both men and women should feel free to adopt leadership strategies that will help them succeed. The recognition of the diversity of leadership styles can encourage a leader to develop his individual strengths in order to improve the effectiveness of an organization.

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Vyacheslav Grykhorenko
O.V. Bormotov, research supervisor
O.V. Khazova, language adviser
National TU «Dnipro Polytechnic», Dnipro, Ukraine

Land boundaries inconsistency in Ukraine: reasons and solutions

From 1992 to January 2013 the main document certifying the right of land ownership was the State Act about land possession. The issuance of the Act was preceded by the registration of the land documents. First, land ownership acts and land documentation were issued only in hard copy. But starting from July 2003, both hard copy and electronic format on magnetic media were introduced.

As a consequence, not all information about land ownership registration dated before January 2003 was converted into digital form, so now some owners may face the challenge of rejection or validity of their property rights. It happens because in some cases geospatial location of land parcels was determined inaccurately as some land management companies didn't make measurements on the spot but provided data on the paper only without binding the turning points of the parcel boundaries to the national geodetic network. This caused data inaccuracies in land deeds and led to the errors in determining the boundaries of land parcels, i.e. when one land parcel overlaps another, usually a neighboring, land. This is the reason why many users and owners encounter difficulties while registering, re-registering, getting the cadastral numbers of the previously registered land parcels.

Another serious problem is that the state geodetic network has not been updated for 30-40 years. So, each land management organization still uses its own geodetic network. Basically, the starting points of the survey are temporarily fixed coordinates which are determined by GPS observations. And if the boundaries are measured by different land management agencies, errors may occur.

To solve these problems, it is necessary to develop the state geodetic network in a unified coordinate system which will be comprehensive, current and accessible for all the agents of surveying and land management with fast coordination and communication over the Internet. In this case, standard geographic information system (GIS) software should be used at all levels. This unified geodetic network must also comply with international standards based on satellite positioning.

However, the accuracy of surveying also depends on the qualification and practical skills of a surveyor who has to strictly follow the instructions for the factual survey to prevent errors in measurements. According to these instructions, the average error in the position of objects and boundaries of a land parcel in relation to the nearest fundamental points should not usually exceed 0.4 - 0.5 mm on the territory with multi-storey buildings or 0.7 mm in mountainous and forest areas.

So both an updated nationwide geodetic system and strict fulfilment of the surveying rules could eliminate the problem of land parcel overlaps in Ukraine. However, many technical, financial, legal, organizational, educational and political challenges must be overcome to introduce these changes.

Daria Kirtsova

E.V. Trifonova research supervisor

O.V.Khazova language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Shortage of Qualified Management Staff as One of The Main Problems of Ukrainian Management

The lack of qualified management personnel is a burning problem of the modern Ukrainian economy as it results in a slowdown of the country economic development. An observation of the situation in the world labor market shows that Ukrainian specialists are not always recognized as high quality professionals. One of the reasons is that they have not been accustomed to working efficiently or under heavy loads since childhood. The youth have not developed the ideology of living and working in a tense rhythm in order to win the competition for obtaining a prestigious job. Even having advantage in knowledge, Ukrainian specialists often lose by the criteria of intensity, responsibility, discipline, attitude to labor duties.

The purpose of this publication is to identify the reasons for the shortage of qualified management staff in modern Ukrainian business environment and offer some solutions to this problem.

It is well known that a manager is a hired administrator responsible for an effective functioning of a company. The main functions of a manager include: management and planning of enterprise commercial activities; control over the development of business plans and commercial terms of agreements; hiring staff; development of innovative and investment policies; ensuring the growth of profitability, competitiveness and quality of goods etc. But now it is difficult to find a manager who could make efficient decisions and meet the requirements of modern business. The reasons for this are shown in Table 1.

Table 1

Reason	Description
Out of date technical and theoretical background	Most educational institutions provide training based on outdated resources which do not reflect modern management trends and approaches typical for current economic environments.
Educational services are supplied by the outdated education system	University education is focused on developing general skills not considering complex or specific situations that may arise in the process of management. Classes are conducted by scientists who are often not practitioners.
Absence of motivation among specialists who have worked for more than 5 years in the organization	Most employees with more than 5 year experience start to believe that they have reached the peak of their professional development and do not want to put their effort into further growth. It can be explained by the low level of strategic planning in the company, low level of applied technologies and tools, poorly developed corporate

	culture. However, modern social and economic trends change so fast that a successful employee has to evolve all his life, acquire new skills in order to achieve high results, both personally and professionally.
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Table 2 focuses on the possible solutions of the problem with the qualified management.

Table 2

Solution	Description
A contract between educational institutions and employers	An employer pays for the education of future specialists and arranges their practical training in his company. The company experts can be invited to share their practical experience or to carry out common projects. In its turn, an educational institution guarantees that an employer will receive a highly qualified professional with necessary practical skills in the field of study. In a result students will not have problems with employment.
Attraction of highly qualified managers from other regions	Various benefits (low mortgage rate, vacation abroad, free travel to work place, etc.), higher salary, lower taxes and more convenient working conditions can help attract highly qualified management staff from other regions.
Re-qualification and/or professional development	Development of the company managers' skills can be provided by various lectures, workshops, seminars, CPD courses or trainings. In a result new knowledge and skills will be gained.

Thus, it was revealed that the main problems of Ukrainian management are the insufficiency of the resources and the low level of professionalism, as well as the problems with proper training of specialists in most of the country's universities. These problems can be solved by a number of changes in the educational system of Ukraine. It is necessary to adjust education programs to the latest labor market requirements, update books and equipment, attract practical business experts to the educational process, and change teaching techniques in order to conduct problem-based classes focusing on real-life situations.

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Yana Kogun
O.V.Usatenko, research supervisor
O.V.Khazova, language adviser
National TU «Dnipro Polytechnic», Dnipro, Ukraine

How to save a business in the “off-season”

Statistics indicates that only 60% of the established enterprises survive in a year, about 30% still operate in five years, and only 15% can remain on the market in ten years. And it is a responsibility of a manager to help his organization develop and make a profit in the period of crisis.

In order to succeed, a manager has to plan everything carefully as planning is strategically important to survive in the off-season. So, this publication provides managers with some advice how not to get bankrupt in the crisis.

The first recommendation, which can be really useful for private entrepreneurs, is to have three different bank accounts: the first account should be used to cover expenses; the second one is cumulative where the additional profit, which can be used for business development or survival in the off-season, is saved; and the third account is for entrepreneur’s salary which should account for up to 25% of the total revenue. CEO should also make a list of needs or limitations for cumulative account resources. If there is no such a list of strong needs, a manager is often tempted to put the money in circulation immediately. However, the availability of such an account and a list of emergency help the organization stay alive in the period of crisis.

The second tip is to prioritize payments. First, a manager should pay those obligations that threaten the operation of his business. For example, if employees do not get salary in time, they will likely leave to find a better work. Or if a company is unable to order necessary production resources or services because of some payment delays or problems, it will run out of business as well. So, paying employees and resource suppliers is typically a top priority. Next priority is payment obligations that will result in large penalties like paying taxes, loans or interest rates. All other payments should be prioritized according to the deadlines.

The third advice implies working out the system of discounts. A company manager should make a thorough analysis of expenses and incomes and determine a range of discounts which can be offered to different categories of customers. On the other hand, it is also recommended to reach an agreement with resource suppliers so that they could also provide a discount during this hard period. The “offseason” is also peculiar for them, that is why a mutually beneficial agreement can be reached. However, in order to succeed, a manager should use both his diplomatic, communicative and leading qualities.

All these principles are not very hard to follow. But they just let the organization stay on the market as long as possible, increase the efficiency of work, and always be competitive.

Mariia Korol

T. V. Khomyak, research supervisor

N. M. Nechay, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Innovations in warehousing as a branch of logistics

Logistics is a process which organizes a transfer of deliveries to the ultimate consumer. Like some business structure it has its pain points. The vast majority faced with such problems as fuel expenses, long time of delivery and low-quality service. In the following article possible ways of solving these problems will be described.

The alternative for increasing the accuracy and speed of "manual" operations is the use of data collection terminals. By scanning barcodes, a terminal sends the information about shipment to the operator's soft. In Sweden and Norway some logistics companies use a pick-up-by-voice system. This approach allows to achieve an increase in productivity and sampling accuracy, which is substantially improving the quality of the service.

For the last five years the situation in logistics had improved. Due to technical innovations, which help to speed up and streamline warehousing, automatic sort lines had appeared. Their main point is to replace human labor to improve effectiveness and satisfy consumers' needs. In comparison a human sorter is able to make 70 000 departures per day while robots do up to 200 000. According to Forbes, the new forklifts, called "vision-guided fully autonomous mobile robots," have the ability to process orders (pick and on-board for delivery) four times faster than a human. Prognosing the development in sphere of logistics, there is a real possibility of fleets and truck platooning become totally autonomous by 2030. While replacing or aiding man was a criterion for technology in material handling, for fleets, the value of autonomy centers around fuel economy. Truck platooning, for example, could save as much as 20 percent on fuel costs.

One more idea to reduce fuel expenses is to replace them with data. With big data we can notice the conversation shift from estimating the volume to the variety and value of data. This is a good way which helps to recognize a spam in the large amount of information. For example, Amazon is trying to avoid that and create predictive analytics around making orders. It has a strategy to ship products even before a potential buyer knows he wants it.

Not so far along, a mobile app, called Uber, had appeared on soft market. It also can be used in logistics purposes. It was manufactured to match truck drivers to shipper needs on rates, routes, and schedules. This is expected to automate a number of processes which refers to delivery status, dispatch, load-finding and driver payment, apart from providing critical real-time information about shipment. The result of using this app will minimize operating costs by improving asset utilization and fuel efficiency.

The blockchain technology could emerge as the new operating system for supply chain networks that combines B2B connectivity with software apps. For

instance, if you are the warehouse head responsible for flow of goods, there could be occasions where suppliers fail to deliver goods intact or on time, leading to potential time-consuming disputes and punitive legal recourse measures. Blockchain technology will avoid such situations as it would allow you to negotiate smart contracts with suppliers that clearly define terms, conditions and the mode of functioning between the two parties, while further monitoring of all goods generates critical information on the state of goods and the time of delivery.

For cutting delivery time and getting orders as soon as consumer wants it, deliveries by drones and robots had been developed. But the problem is that drones can only make deliveries of small packages and for a certain distance without charge. Despite that, there is a possibility to send out orders partially: to street addresses or zip codes in order to get the shipment as close as possible to the consumer and then in-transit complete the address and route it to someone who has placed the order.

Summing up the information above, logistics should be a complex and dynamic process. On the one hand, human labor is going to be replaced by the newest generations of robots which are easier to program, more flexible and affordable but on the other hand the quality of service will be improved, the revenue will be grown and, perhaps, more powerful inventions are going to be created.

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Anton Kravchuk

Y.V. Terekhov, research supervisor

V.V. Gubkina, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Project Management Effectiveness by Applying Neural Networks

The artificial neural networks (ANN) are a new form of artificial intelligence that use mathematical algorithms built on the principle of biological neural networks. Project Management is a difficult running system affected by such internal factors as quality, cost, schedule, security and other aspects, and by such external ones as social, economic, legal, natural and environmental factors. For this purpose, artificial neural networks allow project managers to forecast and perform all aspects of schedule control, budget adjustment, project duration and successful completion of the project.

It should be emphasized that a neural networks model is similar to the human brain. Each neuron can be considered as a simple microprocessor where signals are received and processed, and then transmission of another signal takes place. The structure of a neural network includes an input layer that receives data from the outside world, a hidden layer that serves the purpose of modifying an internal signal according to the problem, and an output layer that represents the solution of the problem.

Forecasting by applying neural networks involves two steps: training and learning. Training process is to give reliable data, containing inputs and desired outputs into the network. In the learning process, a neural network adjusts the weights and biases based on minimization of error measure between the produced outputs and the desired outputs. The model operation steps include:

- Defining learning rate, momentum factor and random numbers between 0 and 1.
- Calculating for each unit output from the input layer to the output layer.
- Computing the network error. If the error satisfies error requirements, the study is finished.
- Correcting the learning signal on each layer and weights accordingly.

Historical data or previous cases to make a neural network having an impact in all aspects of effective management are generally required. In constructive management, ANN are the main analysis tool that allows managers of construction company to indicate the importance of each factor for particular project outcome, find the best way to avoid overruns, downtime and examine the construction cost variation tendencies. Therefore, it makes project management more objective and effective.

The artificial neural network can be used as a tool to predict effectively the project duration, prevent project overruns and incorrect scheduling. That is a good alternative to conventional methods as it works faster, smarter and gives precise results. Moreover, the neural networks model allows the project managers to focus on the key success factors and reduce the level of economic, social, and production risks.

Diana Kulkova

O.Y. Churikanova, research supervisor

N.V. Poperechna, language adviser

National TU «Dnipro Polytechnic», Dnipro,
Ukraine

How to motivate people nowadays?

Today the biggest question of innovative management is ‘How to motivate people nowadays?’

Firstly, I want to tell about the experiment “Candle problem”, created by Karl Duncker. It consists of the next. The experimenter brings someone into the room, give a candle, a box with thumbtacks and matches. And this person must attach the candle to the wall in such way, so that the wax does not drip onto the table. And a lot of people do this task not right. Because they “doesn’t see” that they need to use box. They see, that this box can be used only for thumbtacks. And they can’t see another function of this thing. This is functional fixedness.

But after some time, 5-10 minutes, people in this room find the solution. They “open their mind”, don’t think about typical function of the box and try to use it like a platform for the candle. This is candle problem.

Secondly, I want to explain the first Glucksberg's experiment. It shows the power of incentives. The experimenter got two groups of people. To one group he said, that he wants to see, how much time normally people need for doing this task. To the second group he said, that people with best results will get money bonus. And the best person will get the biggest money bonus. It was incentives for second group.

The result showed, that second group was doing this task longer on 3 minutes, then first group. Money incentives didn’t help in that task. Such motivators, like ‘if you do this, then you get that’, work in some circumstances. But for a lot of tasks, they don't work or, often, they do harm.

A lot of firms nowadays use methods of entirely around these extrinsic motivators, around carrots and sticks. It was good solution for a lot of tasks of the last century, but in 21st century tasks, that mechanistic, reward-and-punishment approach doesn't work, often doesn't work, and often does harm.

The second experiment Glucksberg's was the same with the first, but it was only one difference. Thumbtacks were not in box, but near it. And it was the same: two groups, one - normal, second - with money incentives. In this experiment the second group won. Because when the thumbtacks not in the box – the task is easy.

Incentives work really well for those sorts of tasks, where there is a simple set of rules and a clear destination to go to. Now in 21st century are important tasks which needs the more right-brained creative, conceptual kinds of abilities. Because simple tasks can do computer or cheap labor.

Thirdly, I was interested of Dan Ariley and his experiment with MIT students. The experiment consists of different games and tasks. Students knew that, based on

the results of their productivity, they expect three levels of reward. Small, medium, large. Better result – higher reward. This experiment was repeated a lot of times in different countries. If the task was easy and just mechanical work, all was expected. Students showed better results for bigger regards. But it was surprise, when they started to do more difficult and creative tasks. As soon as the task presupposed the presence of the most elementary mental efforts, a larger premium led to worse performance.

In 21st century we need new methodology: intrinsic motivation. This method is based on desire to do things because they matter, because we like it, they're interesting, or part of something important.

The company Atlassian created specific FedEx days sometimes in a year. In that days they say to their engineers, "Go for the next 24 hours and work on anything you want, as long as it's not part of your regular job. Work on anything you want." Engineers create something very interesting, new and special in that days. And then present it in the end of the day. They have no borders. And it helps them to create something unique, that's why this days are very important and productive. One day of intense autonomy has produced a whole array of software fixes that might never have existed.

The name 'FedEx days' because you have to deliver something overnight.

This is a type of ROWE system. ROWE - Results Only Work Environment. In a ROWE people don't have schedules. They show up when they want. They don't have to be in the office at a certain time, or any time. They just have to get their work done. This method showed, that productivity goes up, worker engagement goes up, worker satisfaction goes up, turnover goes down. This system it works. Autonomy, mastery and purpose help people to work better.

The last example is Encarta. It is an electronic library from Microsoft. In 1990s the company was doing all incentives for workers, they had money for writing and correcting texts. But after some years appeared Wikipedia. It was really another model: 'Do it for fun. No one gets paid you money. Do it because you like to do it.' And people were doing it. They are doing it even now. Wikipedia won. Intrinsic motivation won. In 21st century it is more important, then method of rewards and punishments.

In conclusion I would like to say, that in 21st century methods of doing business have changed. Now the model of rewards and punishments doesn't work in a lot of situations. The tasks nowadays need creative mind, new ideas. Intrinsic motivation helps to improve best results, to create new products, to solve difficult tasks. Innovative management need to use new model of motivation and the results will be successful.

Maria Mischenko
E.V. Trifonova, research supervisor
O.V. Khazova, language adviser
National TU «Dnipro Polytechnic», Dnipro, Ukraine

Improvement of logistics management as a factor of increasing the economic efficiency of a company

Under the current conditions of economic development, the improvement of logistical support is one of the most important factors in increasing the economic efficiency of an organization as a whole.

Logistic processes are of vital importance for the successful operation of any enterprise. Effective functioning of the logistic chain - ordering, procurement of material resources, delivery, distribution and storage of goods - depends on the efficiency of an enterprise as a whole and the successful implementation of its production plan. The costs related to the movement of material flows reach 50% in the cost structure of almost any enterprise. So, a successful management of these expenditures greatly influences the value of the company final product.

Thus, the logistics management includes a number of functions which support an enterprise productivity and efficiency:

- 1) planning that determines the optimum amount of resources necessary for a single production cycle and production of a specific batch of goods and services using such indicators as materiality and return on assets;
- 2) procurement which follows the demand plan, controls the process of making contracts, and processes all "errors" of production;
- 3) storage that focuses on developing guidelines, principles, standards and instructions of a company stock storing and using;
- 4) counting and control of supplies and raw materials necessary for production.

Many scientists and practitioners describe different methods of the logistics system optimization. Some of them include application of new technologies in production; joined or combined production; capitalization of the renovation of enterprise durable means of production through investments, etc.

Planning of material supply influences the process of decision making on procurement. Inventory and logistics management deals with a big number of calculations required to determine the nomenclature composition, volume, and target destination of the resources, the sources of supply and the amount of expenses needed for the introduction of the procurement system.

Therefore, the effective functioning of an industrial enterprise depends on the logistical supply arrangements and requires the improvement of the supply system as a part of a company strategic management plan.

Kostyantyn Paplik

E.A. Novikova, research supervisor

O.V. Khazova, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Factors influencing the cargo delivery method

Cargo delivery by trucks can be carried out in two different ways: straight and terminal. The straight method implies the delivery of goods by one transport unit without the change of drivers. In contrast, the terminal technology allows the replacement of both drivers and vehicles during the transportation process.

As terminal method of transportation can significantly increase the speed of goods delivery, it is widely spread nowadays. This is achieved due to breaking the "vehicle-cargo-driver" connection. Breaking the "cargo-vehicle" connection is carried out by replacing cargo modules at terminals and binding certain trucks with particular delivery lines. Sharing several cargo modules by some vehicles entails the problem of module storage in the process of transportation. Breaking the "vehicle-driver" connection implies the replacement of drivers at terminals and binding the drivers to the particular areas. Sharing one truck by multiple drivers raises the problem of maintaining a vehicle proper technical condition. However, all these measures are aimed at reducing the time of cargo delivery with the simultaneous increase of a vehicle available time.

Taking into account a driver mode of operation and rest in a trunk line service, the following methods of cargo delivery can be used: a «relay» method with the replacement of drivers after 4 or 8 hours; a straight method with two drivers and availability of sleeping facilities in a car cabin; a straight method with two drivers without any facilities for sleeping; a straight method with one driver; a traction method with a tractor change after 8 hours.

According to the international agreement on the driver mode of operation and work on vehicles with more than one trailer (semi-trailer) or an automobile train with a weight of more than 20 tons, two drivers are required to replace each other after 450 km. Each crew member daily rest period must be at least 11 hours, with an exception of going down to 9 hours maximum at the place of permanent residence two times a week. If a crew consists of two drivers and a vehicle is not equipped with the sleeping facilities, each crew member must have a daily rest of 10 consecutive hours within the 27 hour period before the beginning of the operation. If a car contains equipment for sleeping, the drivers should have at least 8 hour daily rest within the 30 hour period. Drivers should have rest outside the vehicle or if there is a place for sleeping, the rest in the vehicle is allowed when it is stationary.

In order to compare different methods of transportation such characteristics as the time of a vehicle operation period during the day, the speed of connection, the maximum possible mileage are considered. However, the calculations do not take into account possible delays at the borders or replacing a driver or a vehicle at any point of the route, as well as constant traffic along the highway and the possibility of a rest at any time.

Andrii Parfenenko

I.V. Novitsky, research supervisor

N.M. Nechai, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Development of the inventory management system into scientific-production enterprise “Alliyans”

The problems of inventory management for the manufacturing company are the most numerous classes of economy sums. Correct and timely definition of optimal inventory management strategy and normative level of resources allow liquidating assumed stoppage of production process. Many optimization algorithms were developed to solve this problem and one of the most effective of them is stochastic version of a model to identify economic size of order. This algorithm was used to develop inventory management system for company “Alliyans” whose the main field of work is production of paints and varnishes. It was suggested to analyze the most popular ingredients for production and find out which economic size of order will be the most optimal to avoid pauses in the production process.

Firstly, statistic data were analyzed for 2 years of work to understand how we can approximate the statistical distribution function to one of the standard distribution functions. It was proved that this function can be described by the standard distribution functions by using standard general formula of the statistical distribution function [1].

After this an approximation was made for demand distribution using normal distribution. Normal distributions are important in statistics and are often used in the natural and social sciences to represent real-valued random variables whose distributions are not known [2]. The next step was to test the hypothesis about the normal distribution of demand at a level of significance 0.05 by using Pearson criterion. The results showed that the difference between experimental and theoretical data is negligible. The study data are in good agreement with the normal distribution.

After conducting such studies for each constituent components, we can say that the demand for 3 types of main composite components of paint and varnishes are distributed according to the normal distribution.

The main step was to determine the economic size of the order of components. In this case the resulting function of total costs per unit time has this form [3]. This formula was purposed firstly by Hemdy Taha in 1971 [3]. By using mathematical transformations to this formula, the optimal order will be found from formulas and [3]. Since the equations can not be determined explicitly, a numerical algorithm proposed by Hadley and Whitein[3] is used to find optimal size of order and level of stocks when we need to make a new order. The final part of this research was sensitivity check. The main idea was to check if some parameters of normal distribution are changed, how it will influence on the size of order and on the level of stocks after which we need to make a new order (further R^*). Firstly, the expected value was gradually increased and it showed only linear dependence. That means that

with increasing of expected value it does not show any significant changes: with increasing of expected value R^* also increased and size of order was still the same. After this expected value was fixed and standard deviation was increased. This experiment also showed almost linear dependence, that is mean no specific or unforeseen deviations were observed. With increasing of standard deviation both R^* and the order size increased.

Having compared the indicators of total costs of the existing inventory management system at the enterprise and developed this research, it was concluded that the stochastic version of the model of the economic order is more advantageous. The savings amounted to 0.077 thousand hryvnias on each order of the 3 main components. So it helped to reduce total costs up to 11% for each order. This is significant result for big manufacturing company because the volume of orders per year can be amount to millions. The development of the inventory management system has minimized total costs compared to the total costs of the existing inventory management model at the enterprise.

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Andriy Patruchev
L.O. Anischenko, research supervisor
I.P. Nikitina, language adviser
National Metallurgical Academy of Ukraine, Dnipro

Investment Process in Management

For increasing the competitive ability, stability, effectiveness of company it should fulfil improvement changes according to changeable business-environment. Most of the changes are occurring as investment projects.

In general management system investment project can take up different places in compliance with project character and scale of changes, area of activity, budget and other characteristics. It may belong to strategy management level, tactical management or executive management. By the area of activity, it may be market projects, production projects, personal development projects, operational improvement projects and many others.

Investment process should not contradict with adjacent processes of the company.

Investment project — is a temporal measure, directed to unique product, service or result creation.

Following algorithm of project realization may be proposed for practical activity.

Investment process is subdivided into four main stages and has the following structure:

- 1) initiation and planning;
- 2) development and approval of project business plan;
- 3) execution/realization of intentions;
- 4) closing and tracking of the effect on the project.

Each stage has a range of control points — milestones and responsible people.

Stage I "Initiation and planning". The phase of investment process start occurs if there is the investment idea and includes 5 control points:

- 1) creating and sending the initiative to responsible department;
- 2) estimation of information sufficiency and completeness;
- 3) first check project effectiveness calculation (based on indicators — NPV, IRR, DPP, PI, sensitivity analysis of the project);
- 4) comprehensive audit of the projects, decision is made on reasonability of further development of business plans;
- 5) approval of the schedule of business plans development for the investment projects.

Stage II "Business plan". In terms of the stage "Business plan" a project manager is appointed. The core staff and plan of actions of the project teams are set by the project manager.

This stage includes:

- 1) development of process description, check of availability of raw material resources etc.;
- 2) development of Technical Assignment for the supply of main equipment;
- 3) development of Technical Assignment for basic engineering fulfillment;
- 4) assessment of technical parts of the equipment;
- 5) assessment of civil and installation work value;
- 6) calculations and estimation of the projects economic efficiency, project sensibility and risk analysis;
- 7) calculation of annual effect as well as operational costs under the project;
- 8) working out the project funding and implementation schedule.

Stage III "Object/purpose fulfillment" includes:

- 1) approval and making agreements regarding design and engineering equipment purchasing;
- 2) tracking and control of equipment manufacture and supply schedule, operating financial plan formation;
- 3) monitoring of relevancy of the project implementation;
- 4) accomplishment of project design work;
- 5) accomplishment of civil and installation work, contractors` management, scope and work quality acceptance, collection of as-built documentation, signing of work completion certificates, commissioning work;
- 6) launching the operational process;
- 7) attainment of project capacity subject to target values and project objectives;
- 8) putting in operation, object transfer to project user.

Stage IV "Completion and tracing of project effect'.

This stage includes:

- 1) analysis of project goals achievement;
- 2) factor analysis of investment project implementation effect and analysis of the causes of deviation from target result;
- 3) analysis of received experience;
- 4) monitoring and confirmation of investment project results in the process of post-project control.

So the investment process is a combination of actions on investment resources accumulation and usage, improvement of production, quality, development the new types of products, etc. with the purpose of company`s commercial cost growth and competitiveness increase at the world market.

Daria Popova

V.I. Korsun, research supervisor

V.O. Lapina, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Quality Control

Quality control is a process that is used to ensure a certain level of quality in a product or service. It might include whatever actions a business deems necessary to provide for the control and verification of certain characteristics of a product or service. Most often, it involves thoroughly examining and testing the quality of products or the results of services. The basic goal of this process is to ensure that the products or services that are provided meet specific requirements and characteristics.

The quality of products/services can be evaluated in several ways. It is important to identify different dimensions of quality Garrin (1987) under following criteria:

performance (Will the product do intended job?)

reliability (How often does the product fail?)

durability (How long does the product last?)

serviceability (How easy is it to repair the products?)

aesthetics (How does the product look like?)

features (What does the product do?)

perceived Quality (What is the reputation of the company?)

conformance to standards (Is the product made exactly as the design intended?)

Quality control performs many different functions.

Firstly, it sets the desirable norm or standard of quality expected of the article, product or service. This factor is composed of two attributes: the nature of the product and the consumer or user satisfaction that is expected of it. Thus for a sophisticated machine tool are an automobile part or aircraft component or a ball bearing the highest precision, quality and rigid tolerance are necessary. For an ordinary kerosene stove the different components need not observe such rigid quality standard. Secondly, quality control provides the desirable quality. Each article carries a quality assurance. It seeks to establish production condition, by which variations in the form of the expected quality standard are minimized.

The next point is to ensure that both excess quality and under-quality are avoided. In addition to it, the range and frequency of variability are minimized according to quality standard.

Lastly, cost and quality have to be optimally matched. In fact, almost any quality can be achieved if the price is paid for it. No businessperson aims at achieving quality at any cost. Good business consists in coordinating cost and quality, which puts the best margin between cost and sales.

The benefits of quality control are encourages quality consciousness, consumers satisfaction, reduction in production and inspection costs, improved techniques and methods of production, effective advertisement and increased sales.

Vladimir Sidochenko

I.A.Taran, research supervisor

O.V.Khazova, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Supply Chain Management

The paper considers the problem of creating a rational chain of grocery supply to a retail outlet where the delivery of the whole range of products is carried out from a company single logistics center (SLC) located outside the city. The focus of the research is to ensure the efficiency of the supply chain by minimizing the total costs and providing direct deliveries through the distribution center located in the city.

First, the optimal number of outlets should be determined. The increase of the total economic effect of the company's activities is achieved by optimizing the customer service coverage which is calculated based on the market share which includes such indicators as volume of sales, market capacity and half of total demand. Then, the necessary number of outlets is calculated and their coordinates are added to the sketch map of the city. Reduction of the supply chain length to decrease costs is achieved through the complex optimization of the supply chain structure and parameters. Thus, the optimal length is calculated based on the coefficient of static use of a vehicle's carrying capacity and the coefficient of SLC's relative remoteness from the city. Then the adjusted costs of the delivery to the outlets are calculated.

The second step is choosing a strategy for managing inventory. There are two inventory management strategies: a fixed order size strategy and a constant replenishment strategy. Choosing one or the other strategy is guided by the minimum of the adjusted costs. These costs include the following components: the cost of replenishment, the cost of immobilizing funds, the costs of reserve storage and checking, and the deficit related costs. Having calculated the value of each component, the most profitable strategy can be chosen.

The optimization of transport unit parameters is made based on the periodicity of supplies, the vehicle's carrying capacity and the average daily consumption of products in the distribution center. The next step is delivery of goods to the outlets which requires the optimal number of check-in points on delivery routes to guarantee the total number of outlets to be served at a particular time, and a maximum load capacity of the vehicle. The position of the DC in the city should minimize transporting when delivering products to the outlets.

The calculation of the required warehouse parameters takes into account a useful area of the warehouse, receiving and dispatch bays, an additional area and a staff area. The warehouse-related costs include lease and utility costs, equipment and salary expenses which are added to the costs mentioned above. The calculation of the economic performance indicators considers annual costs of inventory management, transportation costs, freight processing costs, and the distribution center costs.

So, company logistics development and implementation requires substantial management efforts, time resources and proper investments into staff professional training, but it definitely provides competitive advantages for a company.

Vladislav Symonenko

Y.V. Terekhov, research supervisor

V.V. Gubkina, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Project Management for Developing Countries

Today the project management process is highly problematic. Many foreign and domestic economists have devoted their research papers address emerging problems in project management and they are offered a variety of approaches.

Projects are the basic building blocks of development. Without successful project identification, preparation and implementation, development plans are no more than wishes and developing nations would remain stagnant or regress. A project is a finite activity, not only in time, but also in the use of resources. Examples of projects include construction of a bridge, highway, power plant, repair and maintenance of an oil refinery or an air plane; design, development and marketing of a new product, research and development work, etc. Project management is defined as an application of knowledge, skills, tools and techniques to project activities to meet project requirements (Kloppenborg, 2012).

The types of project most common in developing countries, and which are considered to be the backbone of their developmental efforts, include but not limited to the following: Public Housing, Literacy, Industrial Facilities, Commercial Buildings, Power Plants, Dams, Irrigation Systems, Roads and Transportation, Water Purification Plants, Health and Sanitation Facilities. In the process of creating productive assets, projects optimize the process of resource allocation. Since projects can be successfully completed only with a focused attention on goals by the project team members, projects act as a means for consolidating the experience and expertise of the organizational members effectively, create a learning environment, encourage team spirit and help to achieve organizational objectives.

The probability of project management being successfully implemented can be greatly improved by carefully choosing the organizational model, the project manager, and the personnel to be involved in the project. Project management may be applied effectively to any ad hoc undertaking. If such an undertaking is unique or unfamiliar, the need for project management is intensified. In some cases, such as that of an undertaking whose successful accomplishment involves complex and interdependent activities, a project manager can pull everything together to accomplish an organizational goal (Cleland & Ireland, 2007).

Unfortunately, project management will not always be directly applicable. Small projects and those that are very simple or very repetitive will not justify the use of project management. It should therefore be used judiciously, i.e. only when the organizational climate looks likely to adapt successfully to its use, and only when its advantages are really needed.

It should be concluded that project management has proven to be an effective and flexible management approach, which has the potential of being of great value to

developing countries. A stronger emphasis on project implementation as a training mechanism for developing indigenous skills is still required. Moreover, improved planning, administrative and technical capacity must be defined as project outputs. The need for highly trained development administrators, especially those with project management skills, is a recurring theme of international assistance evaluation reports. It should be emphasized that developing countries require two types of trained project administrators: those who can plan and coordinate the entire project cycle and those who can manage the project.

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Andrii Volotkovskiy
V.V. Tkachev, scientific supervisor
M.L. Isakova, language adviser
National TU «Dnipro Polytechnic», Dnipro, Ukraine

Improving the reliability of an operational product quality management system

One of the most important tasks of development of countries is the development of production on the basis of scientific and technological progress with the effective use of materials and raw materials, reducing their prime cost, improving the quality of manufactured products and increasing the number of automated processes. The level of development of the country is characterized not so much by quantitative (output and price of manufactured products), but by qualitative indicators (quality and assortment of these products). To improve the quality of products, manufacturers must invest in the technical control of production or use additional personnel for this. The constant increase in the requirements imposed on the quality of products leads to the need to develop (create) models and tools for automated diagnostics and quality control of products.

At the same time, for the production of high-quality high-tech products, the study of physicochemical materials, the application of the newest methods of their control and research acquire special significance. So, at the present stage there are a number of methods that can be conditionally classified as follows:

1. Using human resources;
2. Hardware (automated quality management systems);
3. Chip or digital (specialized software).

The scientific and technical problems of research into the reliability of automated control systems (hereinafter - ACS) remain relevant at the present stage of the development of science and technology, which is characterized by a significant penetration of information technologies into all branches of production.

Practice shows that the problems of reliability of the automated control system are given insufficient attention. Such studies do not keep up with the growing complexity of production systems, their components and links, which can lead to failures, as well as interruptions and breakdowns of planned production schedules or provision of services to enterprise customers. At the present stage, the efficiency and reliability of managing production systems directly depends on the accuracy and timeliness of the information received. The facts of the occurrence of software and hardware failures, as well as hardware damage during the operation of the automated control system, lead to failure or deterioration of management efficiency, which proves the urgency of research of the software and hardware complex of the automated control system for reliability, namely, determination of quantitative

parameters of reliability and search for ways to improve them.

Thus, the task of increasing the reliability of the automated control system for its full or partial solution requires an integrated approach that takes into account the features of the structure and functioning of both hardware and software mathematics.

In case of abnormal situations, the production process can be either partially or completely stopped for a certain or indefinite period of time, which will result in a loss of cash. In the process of technical systems, there are bound to be times when they work in an abnormal mode. In this case, abnormal situations can arise either because of hardware, or because of software problems.

In practice, during the adjustment of the automated control system, a significant number of errors are detected (about 5% of the total number of commands in the program). At the same time, the costs of identifying and correcting them are comparable to the costs of software design. Errors are classified as follows [1]:

1. System (errors in the formulation of the task and the conditions for its implementation);
2. Algorithmic (incorrect formulation and implementation of algorithms);
3. Software (algorithms encoding errors);
4. Technological (arise in the process of preparing documentation for the program).

The process of debugging and implementing programs is divided into the following main stages:

1. Software debugging - for individual testing of individual programs on test model data, in the course of which the various algorithmic, software and technological errors are manifested and eliminated;

2. System debugging - to check the correctness of the operation of a complex of programs using real information arrays of incomplete volume. In the process of system adjustment, the equivalence of the logical scheme of the program complex to its functional purpose is verified. This eliminates most of the complex algorithmic and system errors;

3. Experimental operation - to verify the functioning of the system using real-world full-size data arrays and in real time.

Nevertheless, the situation when the hardware part of the control system goes out of order is problematic. Such problems can be classified as follows [2]:

- Failure of equipment due to exhaustion of the equipment operating period;
- Hardware failures due to a defect in the manufacture of equipment;
- Hardware failures due to changes in operating conditions;
- Damage caused by external factors;
- Hardware failures or damage are caused by a violation of the order of performance of routine maintenance.

All these situations require the immediate intervention of maintenance

personnel to perform diagnostics and eliminate problems in the operation of the automated control system in order to return the system to its normal operating mode. This can lead to a violation of the operational and calendar production plans, which leads to a decrease in the profitability of the entire enterprise.

In this case, the diagnostics system is an integral component of any system for which a reliability study is carried out in order to apply its methods, increase when emergencies arise in the system.

To solve the problem of diagnosing non-receipt (loss) of data on the state of the production process, the necessary step is the design of a technical diagnostics system that includes, according to [1], the following three steps:

1. Analysis of the diagnosed object, the purpose of which is to determine possible states;
2. Limitation of the list of these states and selection of observable parameters;
3. Development of an algorithm for determining the operability of an object and localizing a defect.

This implies the problem of diagnosing losses and obtaining inauthentic data in the control system. To combat unreliable data, preventive methods are used - routine checks and tests, and to identify them during the course of the production process, separating the fact of the sensor failure from the fact of equipment failure, information about the progress of which the sensor collects, is almost impossible.

However, there is another situation, characterized by a complete failure of the sensor. Such cases can theoretically be separated from the breakdown of production equipment, since they lead to complete losses (lack of fixation of information) of data on the progress of the production process.

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Polina Yehorova

H.V. Varyanichenko, research supervisor

S.I. Kostrytska, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Developing a Marketing Strategy for Effective Enterprise Management

Due to the increased competition in markets, economic instability, emergence of new technologies, political crises, increasing requirements for goods, constant influence of internal and external environment enterprises need to build corporate and functional strategies. The first functional strategy that company develops and which links all functional strategies is the marketing strategy.

There are twelve classifications of marketing strategies. The management of the enterprise may have considerable difficulties when choosing one strategy, which should take into account all the features of the enterprise and its position. To solve this problem the process of choosing a marketing strategy will be presented below. It consists of five stages developed and supplemented by such authors as F. Kotler, G. Armstrong, S.S. Garkavenko, D.V. Rayko, L.E. Lebedeva.

The analysis of the market and the enterprise takes place at the first stage. This allows to determine the current position of the enterprise. Information about the macro and microenvironment of the enterprise is processed during the analysis of the market. The research of the enterprise supposes the complex analysis of its activity. The result of the first stage is the Situational, GAP, SWOT and STEP analysis, which combine all the information processed.

The actual mission and objectives of the enterprise which are based on the results of previous analyzes are developed at the second stage. The mission and objectives are the basis for building a clear strategy and plans.

At the third stage the enterprise management develops a strategy. Initially, segmentation is performed, then the target market is determined (it is the customers who will be served). At the end of stage three the firm decides how to position itself on the market and how to differentiate the products. The company chooses the strategy among portfolio, competitive and growth strategies. Tools at this stage are matrices (BKG, GE-McKinsey, Ansoff, M. Porter, and others).

The tactics of the enterprise or 4P's model is developed at the fourth stage. Tactics details the strategy with the help of a marketing mix.

At the fifth stage the enterprise implements strategy and tactics, builds profitable relations with customers and partners. During the implementation, there is always a need for monitoring activities and adjusting the current plans. After capturing value from customers in return the enterprise must evaluate its marketing performance.

The presented process of developing a marketing strategy which unites the functional strategies will help those enterprises that strive for the smooth functioning of all units, profitable position in the market and customers' satisfaction.

Olha Zubenko

D.S. Tymofieiev, research supervisor

N.V. Poperechna, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Categories of Controlling Risk Management

Annually organizations all across the world lose billions of dollars because of the threat posed by authorized personnel. That includes sabotage, human error, negligence and exploitation by outsiders to consider. There are some approaches how to decline the risk of data leakage by controlling personnel. To protect data and system organizations should use the following clauses.

Classification and Analysis. First, you should classify information by availability, confidentiality, integrity using CIA rating and identify system boundaries.

Identification of Controls. After classifying valuable information establish control standards to impact categories: high, medium and low. Pay special attention to controlling the categories.

Human Resources. Lots of crimes committed by insiders were suspected by employees. Personnel should do background checks of employees, people in high positions, service staff. Take their signs in document about security policies.

Security Awareness Program. Personnel must be aware of security policies. Make the introductory briefing or informational program with tests for staff. Give personnel the chance to ask questions of advocating security initiatives.

Access Control. Control access of personnel. Make the structure of classes with different types of roles. Check the different access to avoid the mistakes. Create the application for remote access and for providing data confidentiality. To prevent unacceptable file downloads use terminal servers to provide remote access to data and systems.

Social Engineering. Provide the safety of information. Create certain processes for protection of information, ensure an escalation path and spread the information about techniques used by social engineers.

Implementation. Next step is to bind business risks of the organization and information security controls. The simple process of applying controls based on sensitivity of data and impact ratings will appeal most compliance problems. All possible changes should be agreed by information security managers.

Audit. To keep data and valuable assets safeguarded it is necessary to take a hard look at who has access to data and also monitor systems. Compare a list of the current personnel of the company with their active accounts.

In conclusion, it should be noted that there is a real threat from authorized personnel in organizations that can cause lots of damage. Although trust to employees is important, control is an integral part of information security.

Section 03. Legal Issues

Alex Bakhchev

V.E. Kirichenko, research supervisor

V.O. Lapina, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Electronic Digital Signature in Protecting Documents and Goods

To protect information from deliberate or accidental distortions in electronic document circulation, electronic digital signature (EDS) is widely used.

The electronic digital signature is formed according to a standard algorithm using the secret key of the marker. It is unique and guarantees the integrity of the control and accounting information from forgery. Attempts to change at least one bit in the control-accounting information or in the electronic digital signature will be revealed during the verification.

General concepts of this protecting method are the following:

- *Electronic digital signature* is a special requisite of the document, which makes it possible to establish that there is no distortion of information in the electronic document since the formation of the electronic digital signature and to confirm the ownership of the electronic digital signature by the owner. The value of the props is obtained in a result of cryptographic transformation of information.
- *The certificate of electronic digital signature* is a document that confirms the ownership of the public key (verification key) of the electronic digital signature to the certificate owner. Certificates are issued by certifying centers or their authorized representatives.
- *The owner of the electronic digital signature certificate* is an individual, in whose name the certificate is issued in the certifying center. Each certificate holder holds two EDS keys: closed and open.
- *The private electronic digital signature key* (EDS key) allows you to generate an electronic signature and sign an electronic document. The owner of the certificate is obliged to secretly store his private key.
- *The public key of the electronic digital signature* (the verification key of the electronic digital signature) is uniquely associated with the private key of the electronic digital signature. It is intended to verify the authenticity of the electronic digital signature.

According to the Federal Law №63-FZ "On electronic signature", there is a division into: simple electronic signature enhanced unqualified electronic signature and enhanced qualified electronic signature.

Thus, the use of electronic digital signature in combination with other protective technologies allows solving the task of protecting goods, products and documents from falsification. It also allows to automate the processing of paper documents, to apply the instrumental methods of controlling the authenticity of security signs that ensure the objectivity of inspections.

Andrey Khukhrianskiy, Anton Solonovich
E.A Zhukova, research supervisor
I.A Ivanchenko, language adviser
National TU «Dnipro Polytechnic», Dnipro, Ukraine

The Anonymity on the Internet: pros and cons

The idea of anonymity is often associated with those ones of privacy, freedom, confidentiality, together they are considered to make comfort for many people. However, in the era of rapid information technologies development, these notions are facing constant changes. The anonymity on the Internet has been a highly debated issue so far, and we need to border between its good and bad aspects.

First, we should distinguish between anonymity and privacy as they are often confused. These two terms are similar concepts but they have slight difference. Privacy is when people can know who you are but no one can know what you do. Anonymity is when everybody can see what you do but nobody knows who you are.

Hence, anonymity is valuable for people that need to freely speak their mind being protected. It can be useful in countries where Internet usage is heavily restricted and citizens' activities on the Web are heavily monitored. It allows dissidents in politics, journalists, activists groups etc., to safely communicate with each other, without being persecuted by government.

On the other hand, anonymity is not always used for only good things. Moreover, there are some types of Internet users that are hiding besides the computer screen anonymously for malicious actions. Thus, it makes easier cyberbullying, stalking, Internet trolling (harassing other users on line just for fun). Thereby, it can be a powerful tool for cybercriminals.

According to statistics, more than 40% of criminal activity occurs in hidden networks, called "Messengers" where the confidentiality of actions is guaranteed. Thriving for keeping the idea of anonymity, or being unaware of what's happening there, their creators don't share any information about users. Unlike them, the content of common social networks e.g. Facebook, is looked through by governmental structures to avoid any criminal actions. Mostly project makers dislike being under surveillance as it casts doubt the existence of anonymity itself, raising the question "What is the purpose of anonymity in these cases if it carries a negative contrast?"

While other 60 % of people are using the anonymizing technologies like social networks to express their opinions often contrary to the public as for many of them it is a way to stand on their own.

To sum up, anonymity gives safety in freedom of expressions as well as the right to privacy. On the one hand, the majority of state structures do not benefit from anonymity among citizens mostly for reasons of safety. In future not every technological project beneficial to society, being investigated by governmental structures to avoid criminal context, can be realized as having "wrong content". For reasons of security the idea of anonymity and privacy might be eliminated.

Vasilisa Holoborodko
V.I. Mieshkov, research supervisor
S.I. Kostrytska, language adviser
National TU «Dnipro Polytechnic», Dnipro, Ukraine

Social Engineering in Information Security

People are very focused on the new computer attack techniques. They forget about the “human attacks”. Social engineering is a method of unauthorized access to information or to the storage systems without technical means. The term has been determined recently. However, the method has been used for a long time.

The main goal of social engineering is getting access to the confidential information, passwords, bank data and another protected systems.

All techniques of social engineering are based on cognitive distortions. The main techniques of social engineering are fishing (stealing user confidential information), phreaking (hacking phone systems by manipulation with tone set), pretexting (using the prepared plan to make the victim to divulge information), getting information from open sources (gathering information from open sources as social networks), shoulder surfing (getting the victim personal information over his shoulder), and reverse social engineering.

Some social engineering experts separate the reverse and direct social engineering. The former is a method to organize the situation when a victim asks a malefactor for help.

In the classification of threats from social engineers the following threats can be determined: phone threats, e-mail threats, instant messaging threats.

The main way to protect users from social engineering is training. So, forewarned is forearmed. Ignorance of the law is no excuse. All employees must know the danger of disclosing information, and the methods that can prevent it.

Besides, the employees must have clear instructions as for the themes they can talk about, and what information for exact authorization they need to get from interlocutor.

There are no common rules to counteract the social engineers, because it is impossible to be protected from all techniques of the method. However it is possible to reduce the success of the method thanks to working out the appropriate policy of data classification; protecting information about clients with data encryption or using access control; training the employees the skills they need to identify the social engineer, to suspect those people, who are not familiar; forbidding the employees to exchange the passwords or to use the common ones; forbidding to give information with secrets to person, who is not familiar or not authorized in any way; using the special verification procedures for all who have requested access to the confidential information and testing the security system.

Maria Petukhova
V. I. Mieshkov, research supervisor
S. I. Kostrytska, language adviser
National TU «Dnipro Polytechnic», Dnipro, Ukraine

Protecting Confidential Information from Unauthorized Users

The use of technology always has its consequences, especially when we sacrifice the inviolability of private life in return. Security on the Internet is quite an urgent problem, which is almost impossible to be solved totally, as malware and websites are being improved all the time. Because of this, protecting your personal information and privacy is important to the World Digital Library.

Keeping information secure offline means locking financial documents in a safe place and keeping information secure from anyone. After using all receipts, physician statements, checks, bank statements and expired charge cards must be shredded. The security of the company allows its employees to feel protected from the leakage of personal offline information. A limited number of documents taken with us can protect against the loss and long recovery of important personal information.

Protecting information on the Internet is extremely difficult. Personal data must be prevented from being used against their owner. When first get on the Internet, computer users are immediately asked for their name, email address and phone number. It is not recommended to connect a chain of these three records, otherwise in case of information leakage, with the help of these data hackers can get access to such possessions as a credit card or any social network account. Using the photos of a person someone can determine where he/she lives. Moreover, a plan of an apartment can be made, work schedule can be established and the value of property can be determined.

The strong password has a key role. To avoid leakage of information, the user needs to get rid of all the personal information it stores. Opening a file from unknown person could expose the system to a computer virus that captures the typed information. So, using security software keeps devices secure. Installing security patches for operating system protects against intrusions and infections that can compromise the computer files or passwords. It is not recommended to use an automatic login that saves user name and password to avoid stealing of financial information and using of another's bankroll.

Volodymyr Stogov

A. A. Martynenko, research supervisor

V. V. Zabolotnikova, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Cyber crime as a problem of Ukrainian economy

According to the UN, in 2018 access to the mobile Internet will receive up to 70% of the world's total population. With the number of users the number of potential victims is increasing as well as the ability to use the Internet to commit unlawful acts. Over the past few years, the threat of cyber crimes has become an acute problem requiring action at the international level. Ukrainian lawmakers began to pay it considerable attention.

Cyber crime in Ukraine. For the day of his work, one hacker could make more than 40 "bank" cards and purchase products for four or five thousand dollars. For example Petya malware, a network worm and an extortion program that attacks computers running Microsoft Windows. The program requires a cash ransom in bitcoin for decrypting and restoring access to files. It first appeared and spread in Ukraine.

The system of countering criminal attacks. The system of countering criminal attacks on security in the sphere of computer and information legal relations is lagging behind in its development. First of all, the complexity of counteraction is determined by the specifics of this type of crime, which consists in:

- Availability - in connection with the tendency to the constant achievement of prices for computer equipment;
- Remoteness of the object of criminal encroachment - it can be thousands of kilometers from the crime scene;
- Complexity of tracing criminals;

First of all, the reason for the popularity and rapid growth of cybercrime as a business is its incredible profitability, as well as the fact that the success of the case is not associated with greater risk. The revenues that cybercriminals get in a few seconds or minutes can exceed millions of dollars. Therefore, today cyber crime is the number one problem in the world. And as a response to this challenge the Department of Cyber Police has been established as a subdivision of Ukrainian police.

Alina Varianychenko
B. Zygmunt, research supervisor
S.I. Kostrytska, language adviser
Lazarski University, Warsaw

Administrative Stage of Extradition Proceedings in the Legal Systems of Selected Contemporary States

There is no universal regulation of the stages of extradition proceedings in the legal systems of contemporary states, in particular, there is no universal regulation of the administrative stage of this procedure.

The extradition procedure of Great Britain is regulated by the Extradition Act 2003, amended by the Crime and Courts Act 2013, which came into force in July 2013. In the United Kingdom's legal system, the first stage of extradition proceeding is conducted by the Secretary of State, who performs initial check of the extradition request. If there is a valid request for the extradition (the request is valid if it meets the conditions of section 70 (3), (4) and (7)), Secretary of State must issue a certificate of a person to the foreign state under the section 70 (1) of the Extradition Act 2003 and send documents to the appropriate judge under the section 70 (9). *A contrario* if the request for the extradition is not valid, the Secretary of State must not issue a certificate of a person to the foreign state and send documents to the appropriate judge, and therefore, the extradition procedure will be finalized.

If the judge decides that there are no juridical obstacles towards the continuation of the procedure of the extradition (section 79), the person's extradition would be compatible with the Convention rights within the meaning of the Human Rights Act 1998 and the extradition would be in the interests of justice (section 83a (4) *a maiori ad minus*) - the proceeding goes into the administrative stage and the Secretary of State makes the final decision on the motion of the foreign State.

The decision of the Secretary of State *a priori* can not be arbitrary and discretionary, because the situations in which the extradition is inadmissible or may be refused are exhaustively enumerated, and are clearly and unambiguously worded.

A decision of the judge or the Secretary of State may be questioned in legal proceedings under the section 116. It is also possible to appeal for the decision making under the section 116.

The Polish extradition procedure includes three stages, which are regulated by chapter 65 of the Polish Code of Criminal Procedure - act of 6th of June 1997.

The first stage is referred to as 'quasi-preparatory phase'. At this stage the state prosecutor shall examine the surrender and, if necessary, secure the material evidence in the country, whereupon he shall file the case with a District Court having territorial jurisdiction over the case (art. 602 § 2 of the Polish C.C.P.).

The second stage is the jurisdiction phase. The jurisdiction stage of the extradition procedure is a two-stage procedure. District Court, after checking if the extradition is inadmissible or not (whether there are any of the enumerated in the art. 604 § 1 of the Polish C.C.P. obligatory grounds for the refusal to extradite), shall

issue an opinion on the motion of the foreign State. The surrender has the right to appeal under the decision of the District Courts. Besides it is also possible to make a cassation complaint to the Polish Supreme Court. It is important, that only the General Prosecutor-Minister of Justice and the Ombudsman have the right to make a cassation complaint.

District Court refers the valid and final order together with the files of the case to the Minister of Justice. Making the decision, the Minister of Justice may take into account not only the situations in which the extradition may be refused (art. 604 § 2 of the Polish C.C.P. contains non-exhaustive list), but also as political factors. This decision is final and not subject to appeal (decision of the Constitutional Court of Poland from 21th of September 2011, case no. SK 6/10; separate opinion of judge Zbigniew Cieslak). The Ukrainian extradition procedure is regulated by chapter 42 and 44 of the Ukrainian Code of Criminal Procedure. Unless otherwise specified by the international treaty of Ukraine, central authorities of Ukraine for extradition shall respectively be the Prosecutor General's Office (for extradition of a prosecuted person in order to conduct criminal proceedings against him) and the Ministry of Justice (for extradition of a prosecuted person in order to execute a penalty or a preventive measure previously imposed). Administrative authorities verify if the extradition of a person to a foreign state shall be refused under article 589 of the Ukrainian Code of Criminal Procedure, which contains non-exhaustive list of the obligatory grounds for the refusal of extradition. At the moment of taking the decision on the motion of the foreign State the administrative stage of the extradition procedure ends, and – if there is no appeal from the surrender against that decision – the extradition procedure ends too. Then, in the Ukraine extradition procedure the court is almost completely omitted, and the role of the court is limited to the outcome of the complaint against the decision of the public administration body, which complaint may be, but not always will be, lodged.

All things considered, it is clear that the administrative stage of the extradition procedure (then the political and international aspects are taken into account) plays an important role in this procedure. Carrying out a comparative analysis of relevant provisions of the legal systems of contemporary states makes possible to create the “ideal model of the extradition procedure” – the model which will guarantee that the institution of extradition does not become a political tool. Against the background of the comparison of legal provisions governing the extradition proceedings, only British extradition provisions ensure protection of the rights of the surrender. The Polish and Ukrainian extradition proceedings require urgent legislative changes to enrich them with new comprehensive and complementary legal solutions. It is necessary to introduce regulation to the provisions of the Polish C.C.P. which would give the surrender the right to appeal against the decision of the Minister of Justice. Provisions of the Ukraine C.C.P. in turn should contain the obligatory jurisdiction stage of the extradition proceedings. The decision of the administrative authorities must be a subject to instance assessment, which is particularly important in cases where the decision is probably arbitrary and discretionary.

Pavel Volyk

I.G. Hulina, research supervisor

V. V. Hubkina, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Perils of Artificial Intelligence Development

Not long ago Artificial Intelligence (AI) was just a part of science fiction and nowadays it surrounds us and makes our lives easier. As any powerful tool its use has some risks. Let us examine what perils the development of AI may bring and which of them have essential reasons to worry about.

The first thing to be considered is the main feature of AI. Generally, it is an artificially created entity (device or programme) being able to perform tasks usually requiring human intelligence. Such unity is usually divided into Artificial General Intelligence (AGI) that could successfully perform any intellectual task that a human being can and Artificial Super Intelligence (ASI) that possesses intelligence far surpassing that of the brightest and most gifted human minds.

The most worldwide known danger of AI development is the possibility to obtain self-consciousness and conquer the world resulting in extinction mankind. This kind of hazard is widely extended because of Hollywood films, for instance Terminator or Matrix, but chance of such scenario is quite low, at least nowadays.

The first reason is the fact that now science is far from making so powerful ASI. Another occasion is that such features as the desire to obtain power, unjustified accumulation of resources, self-preservation, etc. are not indispensable and typical for any intellect as well as natural or artificial ones. These dangerous features may be brought into AI accidentally or intentionally rather not appear independently.

Another peril, namely, as an unemployment rise, has substantial grounds to worry about. The progress in AI development, robotics and other connected fields makes it possible for machines to carry out more and more complicated works faster and cheaper than a person does. According to the estimates of Oxford scientists, about 47 percent of total US employment is at risk of being redundant in a decade or two. Similarly, Moshe Vardi from Rice University in Houston, Texas, admits, that robots will take 50 percent of jobs by 2050.

Not so obvious but still serious risk may be called post-truth world. Current technologies allow creating quite believable video counterfeits being able to imitate speech and its manner. These technical possibilities are often used in film production. Further development may lead to complete identity and blurring of the boundary between truth and fiction, making all people able to create media indistinguishable from the original. Audio, video and photo materials will not be proof of the truth for the trial any more, but still will be able to wet one's reputation.

Finally, we should not forget about trivial human factor. This item concerns ways of AI development rather than its results, but it should be mentioned for the sake of completeness. Artificial Intelligence is created by people that are supposed to make mistakes. Different errors during designing, checking, training and improving of AI may lead to appalling and catastrophic results, which cannot be predicted and avoided.

Section 04. Modern Issues in Philosophy, Social Studies and Linguistics

Diana Atamuratova, Hlib Cherevko
Y.M. Pazynich, scientific supervisor
M.L. Isakova, language adviser
National TU «Dnipro Polytechnic», Dnipro, Ukraine

Problems of Educational and Methodical Basis of Educational Process in Higher School

The analysis of modern labor market shows that for the last decade employers' requirements to experts have considerably increased. Today there is a demand in experts who are comprehensively competent in different spheres of professional activity, have high information and administrative culture, have knowledge in the field of economy, ready to change their character and content of own professional activity. Therefore, the necessity of changes not only in society, but also in approaches to the organization of educational process is indisputable. Important component of high-quality training of specialists is providing students with necessary educational and methodical literature. Investigating the system of educational literature for higher education institutions, professor S.G. Antonova, the deputy director for scientific work of NTs of researches of history of book culture of RAS at NPO Nauka Publishing House, has established that it was created in the 60th years of the last century and includes four types of editions: the first group – program and methodical editions (includes curricula and programs which carry out a task of the organization of educational process). The second group includes educational and methodical editions – methodical guidance, tasks for performance of control and laboratory works.

The most difficult and at the same time the most significant for mastering a subject are textbooks, manuals, abstracts of the lectures entering into group of the training editions. The separate group was made by auxiliary editions: readers, anthologies, practical works, collections of tasks and others [1, p. 32]. The author notices that the university publishes editions which correspond to typological characteristics of legacy system which needs reforming long ago.

We will address the analysis of the third group of the educational and methodical editions used in the course of training of specialists: textbooks and manuals. It should be noted that despite the existing standard and legal base [6, p.104], each university defines types of educational literature to publish, and establishes requirements [3, p. 26] therefore there are certain complications in the comparative analysis of the state of educational and methodical basis of educational process in various higher education institutions.

For example, S. Goncharenko in "Ukrainian Pedagogical Dictionary" includes textbooks, dictionaries, reference books, educational maps, pictures, tables, movies, filmstrips, devices, models and so forth to the concept of "manual", that is objects and

materials which are used in the course of training to provide the best gaining of knowledge and skills by pupils [5, page 223].

As the textbook is the central component in each educational and methodical complex, there is a problem of providing qualitative modern literature, irrespective of a profile of educational institution and its status. At the end of 2006, in Ukraine scientific research of the market of textbooks for the universities for the first time was carried out, and its results were unfavorable: level of providing with educational literature was extremely low and was about 6% by title, and 9% - by the number of copies. Publishing houses and the organizations which are engaged and specialize in educational and scientific literature aren't sufficient. They are only 40 (about 2%) from more than two thousand of total registered in the country [4, p. 16].

But, there is also a problem of fast aging of information that is on printed media. Information provided in the textbook can quickly lose its relevance.

Creation of an electronic repository on the official site of the university which contains references not only to the majority of textbooks, but also electronic abstracts of lectures of teachers, the multimedia presentations of lectures, video records university professors and borrowed in Internet network can become a solution of this situation.

Informatization of education facilitates access for students and teachers to education - to methodical materials, educational multimedia complexes, - simplifies communication of the student with the teacher, receiving on-line consultations. [2, p. 14]. At the same time, we have to consider the corresponding professional training of pedagogical workers. According to O.Ya. Savchenko, training of future teacher demands strengthening the cultural components in the teacher's model. In these conditions, assimilation of psychological, pedagogical and subject knowledge becomes first of all means of enrichment and development of the identity of the teacher who has to be "the person of culture" that defines inherent worth of each child or student. And consequently, professional training of future teacher can be realized only on the humanistic principles: the subject - subject interaction of participants of professional training which provides cooperation and coauthorship of teachers and students, introduction of the personal focused multilevel model of professional training of future teachers.

One of components of modern educational and methodical basis of practical occupation is workbooks. Teachers actively work in this direction both individually, and in dynamic creative groups. The results of these practices are:

- activization of cogitative activity of students;
- application of various forms and methods of training;
- increase in level of educational achievements of students on disciplines.

For the fullest optimization of educational process, computer classes with Internet access to use computers in training, control and self-checking is extremely necessary in the conditions of intensive innovative technologies of training have priority value.

There is an imperative need of development and improvement of system of assessment of quality of education in educational institution.

It is possible to estimate work of the student by means of test control. It can be formative, at almost each practical class, and also at the end of a semester – total check of theoretical knowledge. Existence of test control allows not only to minimize time expenses, but also in due time to receive objective assessment.

Therefore, scientific and methodical and organizational support of educational process is a necessary condition of high-quality assimilation of programs of training of specialists and includes: standards of the higher education; educational and organizational documents of dean's office and departments; educational and methodical complexes of disciplines; information support of educational process (textbooks and manuals, methodical materials, visual aids, computer programs of a subject matter and oth); quality assurance of educational process.

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Kateryna Fedorets

Y.M. Pazynich, scientific supervisor

M.L. Isakova, language advisor

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Nowadays Education

Talking about education we should understand that it is one of the social institutions and it depends on needs of society. Changes are determined by the nature and achievements of scientific, technical and social progress. We are living in the most progressive time of human existence and this reflects in the quick changes, new technologies and interesting absolutely innovative approaches. On the one hand, there are many advantages, but on the other hand there are many problems and questions. How can teachers and educational institutions keep the attention and interest of students? So we should search ways to improve our methods and technologies of teaching, update information and definitely use modern technologies.

First trend is educational technologies. Technologies envelop our lives more and more every day. A modern person needs more to keep attention and interest, which also applies to education. It is very difficult to make children keep attention on usual books when they have a smartphone or tablet with wide Internet world in their bags. There are two main trends: using technologies during lessons and introducing online learning. As technology continues to integrate and change the world we live and operate in, higher educational institutions is increasingly implementing BYOD (bring your own devices) and allowing students and staff to use mobile devices on the Wi-Fi network, and it is not hard to see why. BYOD comes with many benefits, including student engagement, more opportunities for personalized learning access to a host of trendy pedagogical apps not to mention the savings on tech, free-flowing information and data, and greater independent learning.

The other part of educational technologies is online learning. In the past, if you wanted to get a qualification, or even simply learn something new, you would sign up for a course and pay any relevant fees, and then physically attend class. That was until the online learning revolution started. Online lessons open a wide range of opportunities. This is not only convenient, but also accessible education for people with different problems. What are the benefits of online courses? This is an opportunity to save money and time, also having the time for work and family (for adult people who are married and have children). But the most important thing is the opportunity to get education for people with impairments. Our country only starts to try this modern tool in education, taking into account all the benefits, we should develop such important and perspective part of modern education.

One of the largest trends in education is the recognition that education needs to serve a digital world. Classrooms that exist as 'free technology zones' are preparing students for the jobs of the future. In 2018, we cannot deny anymore that it is simply impossible to work and have a high salary without the skills of working with computers and other modern devices. As a result, schools are changing focus from

traditional teaching, with its focus on facts and information, to teaching the 21st century skills, with an emphasis on digital literacy, problem-solving, creativity, and communication. In future classroom, students will need to know how to search for, evaluate, and process information from a variety of sources. But to become more close to this process we need much money to upgrade our technical resources in schools and universities. This problem should be solved at the level of the political program of education in Ukraine. Only in this case our specialists can be a worthy competition in the world market.

Another issue of concern relates to the impact on cultures and languages of new technologies and media. In the conditions of developing the world, in addition to computer knowledge, there is a demand for knowledge of the languages. It is very important to improve teaching of English beginning from primary school. Many countries include English as a second language in their school curriculum, and children start learning English at a young age. We have enough reasons to start developing level of English skills of children and adults as English is the language of science, of aviation, computers, diplomacy, and tourism. Knowing English increases chances of getting a good job in a multinational company within Ukraine or finding work abroad. English is also the language of the Internet and many websites are written in English. The percentage of people in Ukraine who know English is extremely small in our time. It becomes a problem in learning, developing science, cooperation with other universities and finding a job. So, if students know English they have access to much more information, educational publications and works of foreign scientists.

Also national internationalization strategies are trendy for national governments to design strategies that include or focus on the internationalization of higher education. In many cases, the rationale for these country-level internationalization strategies includes trade and economic growth, recruitment of skilled labour force. While the strategies take various forms according to the national context, one common aspect is the aim of international student recruitment, which is clearly of paramount importance for the future of our country.

In our time we have all opportunities to have quick result in learning. It is enough to have the desire and just use any gadget that you have. Internet allows you to quickly learn about global trends, techniques and experiments in education. Some trends are new and should be tested in their usefulness. Unfortunately, there are many trends that are very efficient but they still remain out of use in our country. There are a number of reasons for this: finances, intellectual resources and psychological barriers. Our recommendations would be to invest more money into such education, set new goals and raise learners' awareness.

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Kudria Andrey, Riabii Oleh
Y.M. Pazynich, scientific supervisor
M.L. Isakova, language adviser
National TU «Dnipro Polytechnic», Dnipro, Ukraine

What Do We Mean by a Quality Education?

In past years, there was an opinion that the quality of education implied focusing only on literacy and numeracy. However, talking about preparing students for modern life, they need much wider range of skills and abilities than twenty years ago. So, we can clearly see that this curriculum is now insufficient and outdated. The term Quality Education means not only measuring test scores and read rate per minute, it is much deeper.

In 2016, two leading educational organizations released a statement in support of development goals of the education and course for education for all. According to this statement, education focuses not only on the provision of knowledge, but on each student individually. Attention is paid not only to each student, but also to how they communicate with each other, in this way the Quality Education monitors the physical and emotional state of students.

As we all know, the key factors of quality education are teachers, using of quality learning tools and quality learning environment [1]. But there is a question, how parents can find out which school provides such kind of education? Tracy Dell'Angela, the education blogger, tackled this issue. The easiest way for parents to find it out is to come to school and observe it, watch how kids interact and meet the principal. At the same time, not every parent has so much time to choose the school this way. So, schools accountability comes to help parents in their complicated decision. Tracy Dell'Angela in her article describes the whole situation about introduction of school climate surveys as a part of school accountability, only three states - Illinois, Nevada and New Mexico implemented this point of accountability. The author of the article demonstrates that more and more states need to accept this measure to facilitate the choice of the right school [2].

As far as individual approach to each student is concerned, this contributes to the fact that the student begins to act independently, without the need for external help. In the future, these skills will be necessary for him in obtaining higher education.

To become a developed country in the future, we need to educate intelligent and capable members of society. This can be done through Quality Education that includes the above factors, rather than just the provision of knowledge.

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Iryna Levdyk

G.M. Korotenko, L.M. Korotenko, research supervisors

N.M. Nechai, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

DevOps Culture and IT Education

Nowadays the increasing load of preparing students according to the modern state of IT-sphere, falls on Universities. This sphere is developing so rapidly that there exists a constant need to create software quicker, better and safer. But there is a response to this challenge in IT-sphere: a methodology called DevOps.

For the first time this term was introduced by Andrew Shafer and Patrick DeBois [1] during the discussion about Agile Infrastructure, at the Agile conference, which took place in Toronto, 2008.

In general, DevOps is a culture and practice of creating software, which is aimed at unification of software development (Dev) and software operation (Ops). The basic characteristic of DevOps culture is a strong support of automation and monitoring at all stages of software creation: from integration, testing, to deployment, infrastructure management. And, as a result, there are shorter development cycles, more rapid software deployment, safer launch in close relationship with business objectives. However, the leading IT-experts have pointed out that constant development of approaches, practices, tools and technologies which define DevOps infrastructure development is concentrated at its foundation, which is based on the code of software units, which are continually being developed, accumulated and improved. So, it is not surprising that work on standardization of the great range of program code specifications continues.

Meanwhile, the set of standards is currently developed under the aegis of organization Consortium for IT Software Quality (CISQ). The main direction of the Consortium activity is development and implementation of different standards for the targets, demands and norms, which are aimed at the development of the metric features, that provide the high quality and optimum size of software units. The complex of the standard quality indicators CISQ (or “CISQ Indicators”) is intended for providing security, reliability, effectiveness and convenience of the servicing of software for different levels of application. It is a set of metrics used for the assessment of the level of compliance with necessary requirements to the eighty-six (86) well-recommended rules of software creation.

The proposed metrics are included in the special analysis tools of the statistic analysis of the source code of the programs under study. They let identify critical shortcomings in the developed software for addressing these shortcomings.

Referring to any program component as the subject of work of different interacting groups of participants, it is reasonably to point that substantive contribution is made, primarily, by the developers (programmers, coders). That is why the standardization of writing the program source code, in the authors’ opinion, should significantly simplify all further stages of interacting with it.

This work is supposed to be done in universities within the framework of programming language courses. In particular, at the State Higher Education Institution “National Mining University” at the Department of Software for Computer Systems a Standard of teaching C++ for imperative programming is developed. The Standard is based on *Stanford University CS 106B Style Guide* [3] and *Google C++ Style Guide* [4]. From the Stanford University Standard authors used so-called “CamelCase” for variables initialization and functions description recommendation. The basic concepts of Google Standard were adopted in principle. Needless to mention, the elements of object-oriented programming were excluded.

Guided by the provisions of structural theorem of Bohm and Jacopini [5], the authors focused their attention on the basic structures of C++ language: consecution, branching and cycle. However, it was taken into account that the consecution-structure in C++ does not apply to the group of governing structures, which includes if, if/else, switch, for, while, do/while operators. That is why the commenting of these structures functionalities is put in the individual subsections.

The proposed approach was applied to teach students to think about the meaning of the entered structure, while commenting it. The special attention is also paid to the understanding the elements of the modular programming.

It is mentioned in the Standard that it is necessary to provide comments on function parameters assignment in its description as well as write the short shapes of the functions; follow “standard” in the naming of functions; follow the order of its parameters (functions with input data in the beginning and with output data at the end). Having reviewed the current state of IT industry, the authors reached the conclusion that in general there is a lack of initial phase in DevOps, namely, teaching undergraduate university students the standards of programming for the further use in developing programs in the IT organizations. The standards for different programming languages should be based on the top-down program design by the turn-based granularity and on the structured programming with using main, basic language structures, so that students could focus on the program design and construction, not on the features of programming language.

It is obvious that the best solution would be the consolidation of the best practices for the high-quality training of the future experts. To make the process gradual it is proposed to divide the programming standards into university and professional ones.

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Diana Potaptseva
R.M.Sytaniak, research supervisor
Horlivka Institute for Foreign Languages of
the SHEI “Donbas State Pedagogical University”
(Bakhmut, Ukraine)

Translating literary prose

Translation has always been a complex activity including various linguistic and extralinguistic factors. Translation of literary prose is also the art of conveying the beauty of different genres and an author's inner world and intentions to share something special with the audience. It is more or less exact literary replication of the original 'text', taking into account literal, cultural, psychological and other realities of the target language.

Evidently, 'prose-translation' is the translation of novels, essays, fiction, short stories, comedy, folk tale, hagiography, works of criticism, science fiction etc. It is a type of literary creativeness where the written-work of one language is re-created in another. It is an inherent idea that the translation of poetry is very problematic, yet we have to agree that the translators also have to face lots of difficulties when it comes to translating prose.

However, when the source and target languages belong to different cultural groups, the first problem faced by the prose-translator is finding terms in his or her own language that express the highest level of faithfulness possible to the meaning of certain words. For example, there are some words that are related to typical fabrics, cookery specialties, or jobs; they also represent specific culture and the translators should be very careful in translating such words. They also find it difficult to render ambiguous puns. Similarly, the titles of stories and novels provide many examples of such ambiguities, which are hard or even impossible to translate.

A literary translator must also be skilled enough to translate feelings, cultural nuances, humour and other delicate elements of a piece of work. In fact, the translators do not translate meanings but the messages. That is why, the text must be considered in its totality.

The translation of literary prose is different from literary creativity because its existence depends on the existence of an object of translation, a work to be translated. However, it is not always possible to sketch a separate border line in the real literary procedure between prose-translation and all creative literature. In some examples, a work may not be a translation in the common sense, but it may not be possible to express it absolutely as a work of literary creativeness.

The most particular problems that the translators face include- illegible text, missing references, several constructions of grammar, dialect terms and neologisms, irrationally vague terminology, inexplicable acronyms and abbreviations, untranslatability, intentional misnaming, particular cultural references etc.

Nonetheless, there are some theorists who think that 'literal translation' is not possible. They present three main reasons supporting their stance:

1. Because a particular word in one language often contains meanings that involve several words in another language. For example, the English word 'wall' might be rendered into German as *Wand* (inside wall) or as *Mauer* (exterior wall);
2. Because grammatical particles (verb tenses, singular/dual/plural, case markers etc.) are not available in every language;
3. Because idioms of one language and culture may be utterly perplexing to speakers from another language and culture.

In conclusion, the following solutions for the translators of literary prose can be offered.

Initially, the translation of literary works - novels, short stories, plays, poems, etc. - is considered a literary recreation in its own right. However, as far as the solutions are concerned, the prose-translators should start with the careful adherence to the following principles:

1. a great understanding of the language, written and verbal, from which he is translating i.e. *the source language*;
2. an excellent control of the language into which he is translating i.e. *the target language*;
3. awareness of the subject matter of the book being translated;
4. a deep knowledge of the etymological and idiomatic correlates between the two languages;
5. a delicate common sense of when to *metaphrase* or 'translate literally' and when to *paraphrase*, in order to guarantee exact rather than fake *equivalents* between the source- and target-language texts.

Oryna Shapovalova

I.I. Zuyenok, research supervisor

I.I. Zuyenok, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Using Social Networks in Education

At the modern stage of the society development, there is a mass introduction of information technology in all spheres of human life, including education. Today, social networks are one of the most popular services that keep attention of the majority of the Internet users. Nowadays, they are a universal tool for communication. Moreover, they allow to solve a wide range of tasks in the field of marketing (advertising, promoting etc.) and personnel management. The possibilities of using social networks in education are actively discussed in the world pedagogical community during last years. This paper shares the results of the research aimed at discovering benefits, advantages and disadvantages of social network use in education.

The idea of social networks as a social group of researchers were proposed by Emile Durkheim and Ferdinand Tönnies in the late 1890s, who thought that social groups can exist as a personal and social links between individuals who share their values and beliefs. In a century, with the development of the Internet as a global system of interconnected computers, this idea has found its application in modern social networks which are often referred to as a website that brings people together to talk, share their ideas, interests and news as well as to find and to make friends, being in the virtual environment and communicating via the Internet. They are no more groups of the researchers, but virtual community of individuals.

The range of the purposes of social network use is wide: from personal needs for communication to the desire to develop professionally and grow personally. Social networks can be seen as a good marketing tool which allows to advertise, promote and make a brand not only goods or services, but individuals themselves by creating their Profiles how they would like to be seen by others. Apart from successful marketing business, social networks contribute to promoting education and personal development via e-learning and communicating.

Indeed, over the last decade there is a great change in the ways and forms of people's communication via the Internet, and social networks, in particular. The most popular social networks «Facebook » (at the international level) and « VKontakte » (at the CIS countries' level) meet the needs of the Ukrainian youth and adults in prompt and quick interaction and communication as well as in building their own learning or working space with the help of these publicly available social tools.

Study possibilities by using social networks for education are rooted in the theory of social learning, the assumption that people learn most affectively when they interact with their peers on a topic or within a subject. Strong evidence of the need for social interaction in the learning process is set out in the study of Richard J. Light of Harvard, who discovered that one of the strongest factors in the success of students in

education is their ability to create or participate in small research groups. Students who studied in groups at least once a week were better prepared in the subject than students who were engaged by their own. Experience of being a student and undergoing such patterns of interaction also proves this.

From my perspective, in social education the focus of teachers' attention should be shifted from sharing the content of the subject in a learning activity to giving a task which needs interaction of people around the content being located in groups. That is the reason of foreign experts in the field of e-learning to have encouraged software developers to create LMS (Learning Management System) being integrated with popular social services

Analyzing the international and national experience of using social networks in education from the perspective of students, we can point out the following benefits arguments in favor of their application

1. Social networks are **free to use**. So, there is no need in buying special software for storing digital data if not to open the university network. Moreover, all social networks are accessible for free.

2. **Easy to use**. Students are more involved in social networks than in any other web resources. Many teachers are familiar with and use of various learning management systems, but usually students appear there rarely only when necessary, while they drop in social networks several times a day.

3. **Easy to be engaged** in the classroom work. Supporting the training course with the use of a social network allows students who miss classroom classes to follow academic work in the classroom and take part in it online, being at a distance.

4. **Asynchronous work** gives the possibility of constant interaction of students and teachers in the network in the time more convenient that provides the continuity of the learning process.

However, there are some problems of introducing social networks in education process: additional efforts to organize and support the learning process by providing continuing teacher training; possible lack of open access to social networks of universities; the presence of some factors distracting students from learning activity (rapid information flow, abundance of entertainment content etc.).

Undoubtedly, social networks are becoming a full-fledged educational environment, but it is necessary to examine the educational possibilities of social networks thoroughly to overcome the problems by developing specialized applications for social networks, which can expand the opportunities for organizing and managing the learning process, that is possible by common efforts of IT specialists and educators.

Svetlana Sokolova, Ph.D, associate professor,
Krivyi Rih National University, Kryvyi Rih

Cognitive linguistics in foreign language teaching

Foreign language teaching and learning may profit substantially when discussed from a cognitive point of view. Cognitive linguistics is no longer in its infancy but has grown up in the last years and is now mature enough to be applied.

So, these applications seem to centre mainly around language acquisition and learning issues. The state of foreign language teaching is largely lamented and new methods and strategies are strictly needed.

Starting from the assumption that nothing in language is arbitrary, it might be a good idea to make learners aware of this non-arbitrariness in order to get them understand how the foreign language works and not just to learn rules by heart. This means that subjects such as history or law are taught in English instead of in the mother tongue, thus exposing the learners of the foreign language to a degree that cannot be offered by traditional English lessons. Furthermore, in this content foreign language is used in a much more authentic and holistic way. So far, the results have been very promising.

Combining some reflections on this new kind of teaching with insights from cognitive linguistics seems to be a way of introducing the learners not only to more exposure to the language, but also offers a way to provide the learners with insights into the way language works as well as with insights into the conceptual world behind the foreign language and it tries to prevent the students from generating an indiscriminate mixture between their home culture and the foreign culture.

Considering such experience of Germany we may state that current trends in teaching foreign languages is what the Germans call “bilingual teaching”. As it is stated above, this kind of “bilingual” teaching means that social studies and others are taught in English to German learners, English is then no longer the focus of those lessons rather, the content are foreground. Thus, the learners’ “fluency” in the foreign language is improving along with their knowledge about English-speaking countries because the topics discussed would generally deal with those cultures.

“Bilingual” teaching aims at giving the learners a better chance to express themselves in the other language in a quasi-authentic situation, while the same time offering plenty of opportunities for using the foreign language. This training necessarily leads to a better command of the foreign language. As English currently seems to be the “unofficial” language of the European Union learners are prepared for a European job market where English is lingua franca that is a necessary precondition for any kind of professional success or for further studies at English-speaking university.

One of the most important tenets of cognitive linguistics¹ is that everything in language is permeated with meaning. Meaning, thereby, is considered to be a matter of conceptualization – of how particular language users construe the world anthropocentrically, subjectively and under the influence of a specific cultural surrounding they find themselves in.

Alexander Telipko
Ilya Verner, research supervisor
National TU «Dnipro Polytechnic», Dnipro, Ukraine

Actual Design Solutions in Educational Process and Scientific Activities

Under the university entrance, students already have the skills to work with computer technology, as well as methods of searching for information using the global network. Informatization of society, on the one hand, reduces the time for training in the use of technology, on the other hand, there is now an urgent need to learn how to analyze and process the information received, and also to update these methods.

In the conditions of constantly developing information and communication technologies (ICT) on the basis of the development of computer technology, the problem of forming a high level of knowledge and increasing cognitive activity of students is becoming more urgent. Since there is a clear correlation between the efficiency of ICT use and the pace of economic development of states, as well as the level of its competitiveness, the training of specialists with high skills in mastering modern technologies is a priority. In modern society, the level of development of the country is estimated according to the level of its information potential, therefore the most countries of the world make a lot of efforts to optimize the information sphere.

To successfully solve problems that inevitably arise in the future, in a context of uncertainty, university graduates and teachers must have the ability to change the characteristics of thinking in their discretion. Acquaintance with actual design solutions in the process of teaching allows not only to discover new possibilities for designing and transforming the living space, but also to gain an experience in making creative decisions, without which it is unthinkable to obtain new knowledge and research activities. Designer thinking is characterized by the ability to embody virtual ideas through language into geometric and plastic images, solves functional, planning and constructive tasks. Their thinking includes graphic and imaginative characteristics.

Studying of design methods and means allows to prepare specialists with developed complex of creative abilities, formed by aesthetic views, possessing project language, ready for constant self-development and self-realization. Design activity is aimed at visualizing information for mass distribution using cinema, television, creating graphic styles of enterprises and elements for industrial products, the subject environment, as well as designing complex objects in order to create a harmonious environment. The object of this activity is the process of creating a harmonious aesthetically perfect subject environment in the social and cultural sphere of human life, as well as competitive products.

Throughout its existence, the Chair of the Machinery design fundamentals department of the National Mining University actively implements modern ICT in the educational process and scientific activities. Beginning with the first-year course, the staff of the department gives students of the mechanical and engineering faculty the

following information disciplines: informatics, information systems and technologies, computer technology and programming, computer and engineering graphics. Within these disciplines, students receive the skills of working and developing modern information systems, as well as creating graphic primitives of varying degrees of complexity in modern graphics packages, computer-aided design and electronic document management systems. These disciplines provide basic training in the use of information systems for its further advanced study at senior courses.

Starting from the second year within the course design on the disciplines "Theory of Machines and Mechanisms", "Machine Parts" and other specialized disciplines, students realize the knowledge gained in the first year for modeling and designing machine parts and planning production buildings in modern computer-aided design systems: Ascon Compass-3D, Autodesk AutoCad, Autodesk Inventor, PoweShape in the framework of academic licenses obtained for these software products by the Department.

Within the framework of this design disciplines, students make up a script for a video clip presenting the administering sub-department or their scientific work. After that they get skills and knowledge on working with recording audio and video equipment. In the editing programs, the video clip is assembled and special effects added to emphasize the key points of the video.

The essence of educational practical design works is an independent creative and research activity that unites the cognitive and transformative activity of the student, while ensuring the development of creative abilities and thinking, forming his value orientations.

In the context of introduction of information technologies in all spheres of human activity, the study of the disciplines of the information cycle opens up multifold possibilities for the future specialist to solve a wide range of problems from different subject areas, involving ICT.

In this connection, the problem of organizing training in design decisions in higher education not only in the study of specialization disciplines with the use of information technologies (computer science, CAD, etc.), but also disciplines that did not previously use technical and software tools, became currently important.

The disciplines of the design direction contribute to the training of future specialists as competent professionals who have the knowledge and skills of research work: the ability to quickly navigate information flows, the ability to create new models, and cognitive and practical innovative models of new products, services, technologies in production and technological, economic, educational and other fields focused on innovative ways of thinking and acting, competitive and mobile who have creative activity, a complex of knowledge and skills in the field of design, successfully implemented in educational institutions and in the real sector of the economy.

Mykhailo Tereshchenkov
G. M. Saksonov, research supervisor
I.I Zuyenok, language advisor
National TU «Dnipro Polytechnic», Dnipro, Ukraine

Perspectives of Cyber Security

Nowadays cyber security is an area of employment that offers a lot of well-paid and prestigious jobs. At the same time we can see that the value of information in our life is growing exponentially. It is obvious that soon information will become the most important resource of our world. Consequently, role of cyber security which main purpose is to protect information should rise in a direct ratio. So, it is undoubtedly that jobs of this area will become even more popular and social necessary than now. In this paper the importance of cyber security is described from the perspective of sociology.

The social importance of cyber security depends on the importance of information in our society. The more mankind progresses, the higher the value of information is. Seven centuries ago physical strength and material wealth were appreciated more than information and data. People achieved greatest heights by sword and gold. The ones who tried to expand the horizons of knowledge were ruthlessly burned by the flame of inquisition. But about thirty years ago everything has changed. Both money and strength have found a digital form. Even money mostly turned into consequence of zeros and units. Today people use electronic money much more often than their paper analogue, because of their ease of use. So, by now, all of the things valuable for people have become a part of information making it significance almost infinite.

By the end of twentieth century there had been a strong need to protect information that people had from attack or unauthorized access. People had understood that most of systems can be easily hacked and fraud came to the next level. Thieves replaced their masks and knives with laptops. Stealing someone`s private information or financial data became the easiest way to manipulate this person. Of course, nobody wants to be manipulated and no one will allow other people to interfere in his privacy or arrogate, make public his moral and physical values. Also it should be mentioned that lack of control over funds will lead to destabilize of world economy

This is exactly what cyber security deals with. It protects networks, devices, programs, and data from attack, damage or unauthorized access, so you do not have to worry about safety of your information. That is why it has appeared.

To conclude, while nowadays cyber security is important and prestigious area of employment, in near future it is going to become simply irreplaceable part of our life, because people`s prosperity will depend on it.

Nataliia Tyshchenko
O.A. Yasynetska, scientific supervisor
Horlivka Institute for Foreign Languages of
the SHEI “Donbas State Pedagogical University” (Bakhmut, Ukraine)

Symbolic Meanings of Phytonyms in the English and Ukrainian Languages

The naming of objects and phenomena of the environment is based on people’s spiritual and cultural experience. Linguists have been interested in researching phytonyms as words that both name plants and reflect the cognitive principles of denoting flora varieties in cultures of different nations. One of the components of the national world picture is the image of a plant, which is reflected in the nation’s folklore and language. Names of plants are based on both objective characteristics and subjective perception, with some emotional attitude of native speakers, too. Symbols embody certain moral values and mental insights that have been developed by mankind for millennia. They help enrich the world of signs and meanings. Plants symbolization is present in the culture of any people, and it is one of the earliest forms of artistic developments in history. This viewpoint has been explored and illustrated by folklorists, including J.E. Cirlot [4], O.A. Kutsyk [2], A.S. Mercatante [5], J.M. Paterson [6], I.N. Podolian [3], and N.F. Zolotnitskiy [1], and it remains a highly important and interesting research domain for language learners and translators. Flower names that symbolize the ideals of beauty and ugliness, high and low, earth and divinity, female and male have a significant place in the rich variety of symbolic designations in British and Ukrainian cultures. Therefore, the present study is aimed at specifying the linguocultural peculiarities of symbolic phytonyms in English and Ukrainian comparatively.

For example, a *rose* is a complex symbol. It is ambivalent as it symbolizes heaven perfection and earth passion, time and eternity, life and death, fertility and virginity. A rose that has faded is a symbol of death and sorrow, silence and mystery. A single rose is a symbol of completion, of consummate achievement and perfection. Accruing to it are all ideas associated with these qualities: the mystic Centre, the heart, the garden of Eros, the paradise of Dante, the beloved, the emblem of Venus, and so on. More precise symbolic meanings are derived from the colour of the rose and the number of its petals. The golden rose is a symbol of absolute achievement. The blue rose is symbolic of the impossible. When the rose is round in shape, it corresponds in significance to the mandala. The seven-petalled rose alludes to the septenary pattern – that is, the Seven Directions of Space, the seven days of the week, and the seven planets. The eight-petalled rose symbolizes regeneration [4, p. 193].

In Christianity, the rose is a flower of heaven. The white rose stands for virginity, purity and chastity, Virgin Mary; the red one symbolizes charity and agony, as if developed from Christ’s blood drops. The rose’s thorns are sins, and a rose without thorns is the Mother of God who was liberated by the Immaculate Conception from consequences of the original sin.

In Ukrainian culture, the rose represents health. The white rose stands for silence; the rose bud is a heart that has not yet met love; the yellow rose is a betrayal

and doubt in sincere love. In England, the rose as a symbol has been known since the internecine feudal war of the Red and White Roses in the struggle of the dynasties of Lancaster and York.

The symbolism of the phytonym *rose* is reflected in phraseological units, comparisons, and persistent metaphors. Among the common cross-cultural symbolic meanings, the rose reflects both positive and negative shades: e.g., *no rose without a thorn* – немає троянди без колючок; *red as a rose* – як червона троянда; *not all roses* – не тільки всипаний трояндами, тобто, не все так легко. Differences in English and Ukrainian are obvious in the perception of the symbolism degree in the following examples: *to gather life's roses* – зривати квіти задоволення (generalization); *to blush like a rose* – червоніти, як мак/перець (substitution of the image); *milk and roses* – кров з молоком (demetaphorization and concretization by the colour); *to lose one's roses* – зів'янути, зачахнути (omission of the specific symbol). Ukrainian folklore has songs and expressions that are based on this flower. However, the name of the rose is frequently used in its obsolete form – *рожа*: e.g., *Моя врода, як повная рожа* – *I am beautiful as a rose* (Ukrainian song); *дівчина, як рожа* – *the girl is as like rose* (beautiful). Also, the Ukrainian phytonym is a component of lexical phrases: e.g., *гайова рожа* – *шипшина* – *briar* (thicket); *панська рожа* – *троянда* – *a rose*; *собача рожа* – *польова, дика троянда* – *a wild rose*. An *oak* stands for patriotism, triumph, and victory. Its symbolic meaning can be found in phraseological units and comparisons: e.g., *as strong as oak* – *сильний як дуб*; *mighty oaks from little acorns grow* – *могутні дуби виростають із маленьких жолудів*.

The British people also celebrate the so-called Royal Oak Day (May 29) with the oak leaf as the attribute. The tradition started with the historical fact when Charles II escaped from captivity after the Battle of Worcester, hiding under oak trees. The symbolism of the triumph came from the ancient tradition to put wreaths of oak twigs on the heads of winners.

Slavic mythology is full of legends and retellings about the oak. This tree was considered sacred and associated with the name of Perun who could take fire from it. The Slavs believed that souls of dead ancestors live in oak trees. Besides, the oak has been honoured as a tree of fertility and used to be planted to celebrate the birth of a baby in a family. Ukrainian folklore describes the oak as a strong, iron, handsome Cossack fellow. This symbolism is present in Ukrainian songs: e.g., *Ой у полі дуб зелений, / Під тим дубом вишня, / А там козак конем грає / Щоб дівчина вийшла*. In English, the phytonyms *narcissus* – *нарцис* and *daffodil* – *жовтий нарцис* are associated with Easter. The cultural meaning is also reflected in the phytonym *Easter Lily* – *Великодня лілія* [3, p. 195].

A *blackthorn* is depicted in many fairy tales throughout Europe as a tree of ill omen. This species of flowering plant in the rose family has the most sinister reputation in Celtic folklore. A long hard winter is referred to as a *blackthorn winter* – *теренова зима*. In witchcraft, the plant often represents the dark side. It is a sacred tree to the Dark, or Crone aspect of the Triple Goddess, and it represents the Waning and Dark Moons. The blackthorn is known as “the increaser and keeper of dark

secrets” [6, p. 82]. The national character of the Ukrainian phytonym *терен* represents romantic heartbreak and woman’s loneliness: e.g., *Цвіте терен, цвіте терен / Листя опадає, Хто в любові не знається, / Той горя не знає.*

A *carnation* comes from the Greek *dianthus* for “heavenly flower” of the flower of love. The carnation expresses love, fascination, and distinction. According to a Christian legend, carnations first appeared on Earth after the crucifixion of Jesus carried the Cross. The Virgin Mary shed tears at Jesus’ plight, and carnations sprang up from where her tears fell. Thus, the pink carnation became the symbol of a mother’s undying love.

The red carnation can be understood as a symbol of socialism and the labour movement. Historically, it has been used in demonstrations on the International Workers’ Day (May Day). Light red carnations represent admiration, whereas dark red ones denote deep love and affection. White carnations represent pure love and good luck, while striped carnations symbolize regret that love cannot be share. Purple carnations indicate capriciousness. However, the Ukrainians often perceive the carnation as a flower of revolution, funeral, and commemoration.

A significant number of symbolic meanings of phytonyms are culturally specific. There are connotations that are presented in both languages compared, but their number is smaller. In general, it is possible to speak about the common European basis of ancient mythology and Christianity, in which case the symbolic features are motivated by some commonality or similarity of traditions, customs, and rituals. The origin of semantic connotations in English and Ukrainian phytonyms is present in Indo-European, Slavo-Germanic and modern international traditions, folklore, pagan and Christian beliefs and rituals. Different nationally-specific components, however, are based on separate cultural and historical traditions and language factors (etymology of phytonyms, idiomatic meanings, phraseological (stable) expressions, national traditions, and folklore rituals). Symbolic differences are more typical than similarities, and this can be an interesting prospect of research in terms of linguistic peculiarities and translation of phytonyms.

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Viktor Tsymbalov
Yu. O. Shabanova, scientific supervisor
M. L. Isakova, language adviser,
National TU «Dnipro Polytechnic», Dnipro, Ukraine

Testing: What Kind of Education Should be in Ukraine?

To date, there has been sweeping progress in science and technology. Ubiquitous globalization supersedes almost any specific forms, models of individual manifestations and original social formations. The achievements of one country gain world recognition and become open to public. In this situation, the education system should not lag behind. Therefore, more and more advanced educational programs, new assessment systems are being created.

What is the essence of education? Education is a social progress (and the result) of the constant transfer of knowledge and experience, the formation and becoming of personality in accordance with its inherent biological, psychological and personal qualities in the process of its active social development [1, p. 290].

The large scale of education, achieved in the 20th century, influenced the change in the tasks and functions of the education system, changed its paradigm. One of the innovations of modern education was testing as a tool for assessing learning outcomes, which was finally formed in the first half of the 20th century. Its most successful implementation was realized in the education systems of Western countries. American psychologist E. Thorndike identifies 3 stages of introducing testing into practice of the American school, according to which 1931 was the beginning of the modern stage of school testing development [2]. This time was the beginning of the process of ubiquitous introduction of tests not only in the primary and secondary, but also in higher education. In evaluating the testing system itself, as an example, one can take the most popular classification of tests, according to which there are tests of closed and open types. In closed-type tests, each question is accompanied by ready-made variants of answers, from which it is necessary to select 1 or more correct answers. Open-type tests are distinguished by the fact that here for each question the examinee has to offer his/her own answer: to add a word, a phrase, a sentence, a sign, a formula etc [3]. In closed-type tests, the possible answers are as follows: alternative answers (yes or no answer); correspondence (the examinee is asked to restore the correspondence of the elements of the two lists); multiple choice; elimination of a distractor; sequence.

In open-type tests, the following answers are distinguished: supplement (the examinee should formulate answers in view of the restrictions provided for in the assignment) and free statement (the examinee should independently formulate the answers, because no restrictions are imposed on them in the assignment) [4].

Testing is really a very convenient form of assessing the acquired knowledge. A huge amount of material is reduced to a simpler and more convenient number of key verification competencies. A very useful consequence of creating tests is the processing by scientists, specialists in their fields of all the accumulated knowledge from a period of deep antiquity. There is a general standardization and, in fact, a summation of the experience of mankind.

It should be noted that testing is a pragmatic and rational approach to assessing students' knowledge. With the large scale of people receiving education, there is a problem of the same qualitative and rapid assessment, as before. And the testing system solves this problem, at first glance. However, as a result, educational institutions receive narrow-focused specialists, who lack an outlook. In addition, modern graduates do not have the skills of conscious goal-setting. In some countries (for example, Russia), a Unified State Exam (ЕГЭ) has been introduced, which, in our opinion, narrows the range of knowledge gained, bringing training closer to narrowly pragmatic goals [5, p.61].

Mass introduction of tests in Ukrainian schools, in our opinion, was a mistake for our nation. An Independent External Evaluation (ЗНО), like ЕГЭ, provokes to put efforts only in necessary subjects. The testing system has its own sphere of application. For example, it is suitable for people with fast associative memory. This form of assessment programs a person to memorize correspondences, to memorize numbers and small data related to them. Meanwhile, quantitative knowledge is often not involved in the narrow profile of the work. Tests of closed type (with alternative answers) are very generalized. When using these tests as an assessment tool, it is impossible to understand the real depth of knowledge and the state of thinking of a person. The probability of guessing is 50%, because the student has two choices: "yes" or "not".

Tests of closed type of a variant of correspondence estimate ability of knowledge selection by different categories, sequence of thinking and knowledge from a specific area. But again attention focuses more on the chronological and associative aspect, on the ability to compare, but not to understand or be conscious of this knowledge. Tests of closed type of a variant of excess elimination contain an extra variant of the answer, which provokes the danger of memorizing incorrect answers. Instead of concentrating attention on real knowledge, such tests confuse the student.

Open-type tests are much more informative, because they provide more wittings not only about the results of mastering students' knowledge, but about the work of their consciousness, thinking and character traits. Formulation of the student's answers in open-type assignments can tell a lot and direct the student in the right direction to reveal his capabilities. At the same time, closed-type assignments serve as a destructive force for the student's thinking and energy. In this case, he is deprived to demonstrate his skills, abilities and potential. William James thought:

“the most important property of human nature is an irresistible desire to be appreciated” [6, p.26]. Dale Carnegie in his book “How to win friends and influence people” notes that “the desire to feel one’s own importance is one of the main differences between a person and an animal” [6, p.26]. Everyone needs space to discover their own lights, inclinations, knowledge, skills and abilities. Closed-type assignments cannot provide this capability. Many students lose the motivation to understand and realize at the very beginning of such assignments. They subconsciously collide with the fact of the already formed compulsory answers, quickly getting used to the fact that understanding and comprehension are not tested and are not a criterion of learning. As a result, the majority are demotivated to get education. In today’s increasingly competitive world, Ukraine must take care of its nation. The proof of importance of investing funds and efforts in education can be as follows: according to UN experts, 1/3 of the differences in the socio-economic potential of developed and developing countries are explained by differences in economic models, and 2/3 – by differences in the level of education [2, p.290].

To resolve this situation, we need to significantly narrow the application of testing in the Ukrainian education system. First, it is necessary to abandon all types of test assignments at the level of primary and secondary education, since the foundation of the personality is laid and formed in the school, and also to cancel the Independent External Evaluation (ЗНО) and introduce a new assessment system developed in accordance with the national specifics of education. The new assessment system must be based on assignments that require an individual response from each pupil, which implies the need to include open-type tests of the free statement. Secondly, closed-type tests can be used as one of the types of assessment of final control in small numbers or modular work of technical specialties in universities. At the same time, students of technical specialties must fully explain the logic of solving the problem, demonstrating the course of thinking and conscious knowledge.

Thus, the model of the development of consciousness and awareness of getting education must become the defining one for Ukraine.

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Mykhailo Yevstratiev

M.O. Alekseyev, research supervisor

I.I. Zuyenok, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Developing New Knowledge and Awareness of EU Social and Corporate Culture by Participating in Erasmus+ Programs

Academic mobility of students, various exchange programs are realia of today's internationalization of Ukrainian higher education. This paper is about experience I have gained while participating in Erasmus+ program as an exchange student.

Erasmus+ is the EU's program to support education, training, youth and sport in Europe. Set to last until 2020, Erasmus+ doesn't just provide opportunities for students. It has widened its opportunities for a variety of individuals and organizations by merging of seven prior programs. The aim of Erasmus+ is to contribute to the Europe 2020 strategy for growth, jobs, social equity and inclusion as well as the aims of ET2020, the EU's strategic framework for education and training.

The possibility to get a grant for this kind of Erasmus+ by students is provided in the form of competition by the International Mobility department of the University I study at and the IT department where I study as a postgraduate student. Erasmus program supplies its participants with funds required for living, accommodation, healthcare etc. It covers all expenses, which you may face when going to another country's university. So, I was a lucky one to win this grant and to experience by myself the value of academic mobility.

According to my Erasmus+ program, I studied at the Koblenz-Landau University of Germany. Exploring German culture and facing the specific features of the country educational system was a great and valuable experience. The main difference of study process in the German University is that it is far less strict than in Ukraine. For example, students are given up to five attempts to write the exam paper, but no matter how many attempts they take, this doesn't prevent them to show high performance and/or limit to get high grades. In their turn, professors strive to fill their courses with the up to date information and technologies required in the market right now and give actual examples of their usage. All these factors give students an inspiration to study that one could not resist, me too. As a result, I have raised my awareness of new fields in IT and the latest innovations in this area that caused my high interest to go deeper into the subjects learnt in Germany, especially Web-science and Machine learning. The experience described proves the effectiveness of international student exchange programs which contribute to obtaining new knowledge in the area of study, raising awareness of the other country social and corporate culture and putting hands on practice of the understanding of the newly learnt and having been constructed in the international environment with the help of peers and professors. From my perspective, the programs like Erasmus+ are of high value for Ukrainian students, because they help young people to educate, connect and get a taste of new environment both social and learning. Otherwise, it is a choice of a person to take this chance or not.

Section 05. German language section

Akastelowa Olena

M.S.Paschkewitsch, Fachbetreuerin

I.A. Iaremenko, Sprachbetreuerin

Nationale Technische Universität "Dniprovskaya Polytechnika", Dnipro, Ukraine

Risikos und Gefahren für die deutsche Wirtschaft

Das kommende Jahr steht für die deutsche Wirtschaft unter guten Vorzeichen. Sie wird nach Ansicht der Bundesbank 2018 weiter kräftig wachsen. Zwar geht man davon aus, dass der Aufschwung bald seinen Höhepunkt erreicht hat. Eine spürbare Abnahme des Schwungs erwarten die Zentralbanker wie auch die führenden deutschen Wirtschaftsinstitute jedoch erst im Jahr 2019.

Die deutsche Wirtschaft - die fünftgrößte Volkswirtschaft der Welt (gemessen an der Kaufkraftparität) und die größte in Europa - ist der größte Exporteur von Maschinen, Fahrzeugen, Chemikalien und Haushaltsgeräten. Die Industrieproduktion ist einer der führenden Bereiche der deutschen Wirtschaft. Ihr Anteil am BIP des Landes beträgt 29% und am Gesamtexport sogar 87%. Eine gewichtige Rolle für das BIP spielen auch die Landwirtschaft und die Energiewirtschaft. In den letzten Jahren hat sich jedoch die Gewichtung einzelner Wirtschaftszweige verändert. Ausgebaut wurde der Dienstleistungssektor, der gegenwärtig fast den Stellenrang der Industrie in Deutschland erreicht hat. Die führenden Positionen weltweit haben deutsche Informations- und Biotechnologie sowie Technologien zur Nutzung erneuerbarer Energiequellen und umweltfreundlicher Technologien.

Die Vorhersagen für die deutsche Wirtschaft sind gespalten. Während Wirtschaftsinstitute ihre Prognosen noch nach oben korrigieren, rechnet die Bundesbank damit, dass der Aufschwung der Wirtschaft sich einem Höhepunkt nähert, wenn auch noch nicht im kommenden Jahr.

Das Hauptproblem der deutschen Wirtschaft ist heute die hohe Arbeitslosigkeit und die langsame Wirtschafts- oder Konjunkturentwicklung, weitaus weniger die Inflationsrate. Schon seit den 1980er Jahren versuchte die Bundesregierung mit verschiedensten staatlichen Eingriffen und Programmen sowohl die Konjunktur steigern als auch den Beschäftigungsstand zu erhöhen. Das 2006 beschlossene Wirtschaftsprogramm soll z.B. den Unternehmen durch die Senkung der Lohnnebenkosten Anreize zur Neueinstellung von Arbeitskräften geben. Die hohen Lohnnebenkosten führen dazu, dass viele Unternehmen ihre Produktion ins Ausland verlagern.

Für die deutsche Wirtschaft haben die Analysten für das kommende Jahr verallgemeinernd fünf große Risiken ausgemacht: Protektionismus, Übernahme deutscher Firmen, deutsche Politik, Terrorismus, Cyberattacken. Dass die Gefahr für Unternehmen durch Cyberangriffe wächst, zeigt auch eine Befragung von 450 deutschen Unternehmen durch die Unternehmensberatung EY. Demnach wurden 44 Prozent der deutschen Unternehmen in den vergangenen drei Jahren ausspioniert.

Aber auch niedrige Geburtenraten und ein Rückgang der Nettozuwanderung erhöhen den Druck auf das System der sozialen Sicherheit und erfordern Strukturreformen.

Igor Baranov

N.L.Kurnat, Fachbetreuer

I.A. Iaremenko, Sprachbetreuerin

Nationale Technische Universität "Dniprovskaya Polytechnika", Dnipro, Ukraine

Probleme der Entwicklung des Bergbaus

Um die Sicherheit des Abbaus und die effizienteste Nutzung der Ressourcen unter Berücksichtigung des Umweltschutzes sicherzustellen, muss man über die Perspektiven der Entwicklung der geologischen Erkundung in naher Zukunft klar sein. Es ist daran zu erinnern, dass die geplante Entwicklung des Bergbaus durch grundlegend neue Trends und Richtungen gekennzeichnet ist, die dabei berücksichtigen, welche Maßnahmen ergriffen werden müssen, um die Umwelt zu schützen.

Die wichtigsten Maßnahmen sind die Ausbeutung der immer schlechter werdenden Lagerstätten und damit die Zunahme der Produktionsmengen; Konzentration von Bergbauunternehmen in Gebieten mit billigen Arbeitskräften mit einer vergleichsweise geringen Bevölkerungsdichte, wobei die Umweltverschmutzung die Durchführung von Bergbauvorgängen nicht einschränkt.

Dazu gehören auch die Erhöhung der Tiefe von Tagebau- und Untertagebau-Arbeiten, die die Verhinderung von Leckagen bei der Gewährleistung der Stabilität der Steinbrüche sichert und grundlegend neue Herausforderungen an die Bergbau-Wissenschaft und Technologie stellt, sowie das Ausblasen des Abbauraums und der Transport vom abgebauten Gestein.

Eine große Rolle spielt die Umsetzung der Produktion von Bergbaubetrieben in die ständig steigende Menge von Maßnahmen zum Schutz der Umwelt vor Verschmutzung, Lärm, Dehydration und Störungen der Erdoberfläche. Derzeit wird der weltweite Abbau von mineralischen Rohstoffen im Tagebau dominiert. Deren Anteil liegt bei etwa 60%, davon 57% liegen in der Produktion von verschiedenen Metallerzen. 34% - 97% des Abbaus kommen auf Kohle und Baustoffe. Im Vergleich zu den unterirdischen Arbeiten sichert das zwar eine 3-7fach höhere Produktivität und 2 - 3mal niedrigere Produktionskosten

Daher ist eine Reihe spezifischer Aufgaben für die sichere und effiziente Gewinnung von Mineralien aus den tiefen Horizonten zu lösen. Unter ihnen scheinen die folgenden Probleme am wichtigsten zu sein: 1. Lösung des Problems, den Gebirgsdruck in großen Tiefen zu kontrollieren, Gebirgsschläge zu verhindern, klimatische Arbeitsbedingungen zu verbessern. 2. Erhöhung des Niveaus der integrierten Mechanisierung des Untertagebergbaus bis zu 95%, teilweise Automatisierung der Produktionsprozesse und Übergang zur Software-Fernsteuerung von Bergbaumaschinen und -komplexen. 3. Erforschung der bergbaulichen Bedingungen und ihrer Organisation bei erhöhter Temperatur und Feuchtigkeit. Im Zusammenhang mit der Tendenz, den Mechanisierungsgrad und den Nutzungsgrad von Maschinen in mehreren Ländern zu erhöhen, hat es sich als zweckmäßig erwiesen, kleine oder einzelne Bergbaumaschinen zur Mechanisierung der Produktion bei atypischen Bergbau- und geologischen Bedingungen zu schaffen.

Irina Chocot

V.A. Derbaba, Fachbetreuer

I.A. Iaremenko, Sprachbetreuerin

Nationale Technische Universität "Dniprovskaya Polytechnika", Dnipro, Ukraine

Der technologische Prozess des Werkstücks

Um ein Werkstück effizient und wirtschaftlich zu bearbeiten, muss man die beste Bearbeitungsreihenfolge im Voraus festzulegen. Auch muss man die Werkzeugmaschine, Schneidwerkzeuge, Messwerkzeuge, Geräte und die besten Schneidregime wählen. Das ist ein technologischer Prozess. Er besteht aus einigen Stufen. Auf der ersten Stufe macht man eine Zeichnung. Eine Zeichnung ist ein Dokument, das ein Bild eines Teils oder einer Montagemaschine und andere Angaben enthält. Sie sind notwendig für Herstellung und Kontrolle. Um Zeichnungen in der Industrie zu erstellen, gibt es die so genannte Konstruktionsabteilung. Jetzt verwenden Konstrukteure Computerprogramme, um Zeichnungen bequemer und schneller zu erstellen.

Auf der zweiten Stufe wird die Zeichnung an die technologische Abteilung übertragen. Dort beginnt der Betriebsingenieur mit der Entwicklung des technologischen Prozesses für die Herstellung von Teilen in der Werkstatt. Das heißt, der Betriebsingenieur realisiert die Bearbeitung des Teils an der Werkzeugmaschine, wählt das Schneidwerkzeug, die Geräte, die Werkzeugmaschine, die Schneidregime und das Werkstück aus. Das Werkstück muss der Form des Teils entsprechen, um so wenig Material wie möglich für die Bearbeitung zu verwenden. Das kann Stempeln, Gussstück, Walzgut, Ausschiffung und Schmieden sein. Wenn die Herstellungsmethode für das Werkstück nicht korrekt ausgewählt wurde, kann das Teil nicht erhalten werden. Wenn eine hohe Härte des Teils notwendig ist, die der Werkstoff nicht bieten kann, dann wird die Wärmebehandlung des Teils gemacht.

Die nächste Stufe ist die Bearbeitung des Werkstücks an der Werkzeugmaschine, um Teile mit den endgültigen Abmessungen und Formen zu bekommen.

Jetzt werden neue Technologien und neue Werkzeugmaschinen in der Produktion verwendet. Das sind CNC- Werkzeugmaschinen (Computerized Numerical Control). Sie ermöglichen eine Produktion rund um die Uhr und gewährleisten das Funktionieren von automatischen Werkstätten und Anlagen. Um ein Teil an einer solchen Werkzeugmaschine zu bearbeiten, muss man ein Programm dafür schreiben. Dafür gibt es eine Programmierabteilung. Der Programmierer ist der Letzte, durch den der Prozess der Bearbeitung des Teils stattfindet, daher trägt er die Hauptverantwortung für das fertige Produkt. Er kann die Entwicklung der Prozessroute korrigieren.

Die Qualität der Arbeit auf allen Stufen des Prozesses überwacht die Qualitätskontrolle, die im Fall eines Missverhältnisses des hergestellten Teils die Zeichnung zur Überarbeitung oder zur Änderung zurückgibt.

ABC-Analyse als wichtiges Strukturierungsinstrument in Lagerbestandscontrolling

Heutzutage sind viele Unternehmen durch die zunehmende Marktdynamik dazu gezwungen, ihren Kapitalumschlag zu maximieren und die zur Verfügung stehenden Ressourcen immer effizienter einzusetzen. In diesem Zusammenhang sind die Bestände von besonderer Bedeutung, da sie durchschnittlich 34 Prozent des Umlaufvermögens ausmachen und rund 13 Prozent des Umsatzvolumens der Unternehmen binden.

Die Hauptaufgabe des Lagerbestandscontrollings in einem Unternehmen ist es, Bestände zu optimieren und evtl. zu senken. Hierfür werden üblicherweise ausgewählte Bestandskennzahlen eingesetzt, die meistens artikelspezifisch erfasst werden sollen (bspw. Umschlagshäufigkeit). Bei einer sehr hohen Zahl an Artikeln, wird eine fokussierte Bestandsoptimierung mithilfe der Kennzahlen zu einer kostenintensiven oder sogar unlösbaren Aufgabe. Eine sinnvolle Strukturierung ist für Fokussierung auf den Artikeln, die den größten Nutzen für die Optimierungsmaßnahmen bringen, unerlässlich.

Die ABC-Analyse ist ein typisches, aber nichtdestotrotz etabliertes Instrument zur Transparenzerhöhung und Effizienzsteigerung in der Lagerwirtschaft durch die Trennung des Wesentlichen vom Unwesentlichen. Diese Analyse basiert auf der Erkenntnis, dass Artikeln, mit denen sich ein Unternehmen beschäftigt, lassen sich nach ihrem Mengen- und Wertcharakter in drei Klassen differenzieren: wichtige (A-Artikel), weniger wichtige (B-Artikel) und vergleichsweise unwichtige (C-Artikel). Außerdem weist die Verteilung zwischen diesen Gruppen erfahrungsgemäß eine relativ konstante Struktur auf, wobei sie sich je nach Branche variiert. Grundsätzlich gilt: etwa 20% Güter binden 70-80% des Lagerwerts (A-Güter), weitere 30% der Positionen machen 10-15% des Bestandwertes (B-Güter) und gebliebene 50% stellen nur 10-15% des Lagerwertes (C-Güter) dar. Dementsprechend sind für eine erfolgreiche Rationalisierung mehr Anstrengungen bei A-Gütern zu unternehmen und den Umgang mit C-Gütern zu vereinfachen, um Zeit und Kosten zu sparen. Durch die Einteilung der Bestände können außerdem unterschiedliche Aktivitäten und spezifische Instrumente des Bestandsmanagements zum Einsatz vorgegeben werden. Die Umsetzung der Artikelstrukturierung mittels der ABC-Analyse weist zusätzlich weitere Vorzüge auf: einfache Anwendbarkeit, verständliches Verfahren, übersichtliche Ergebnisse. Dieses Instrument kann in mehreren Bereichen des Unternehmens, z.B. Beschaffung, Vertrieb, Produktion eingesetzt werden.

Abschließend lässt sich zusammenfassen, dass die ABC-Analyse ermöglicht Rationalisierungsmaßnahmen gezielt durchzuführen und damit hilft sie kostenmäßig geringnützliche Anstrengungen zu vermeiden, folglich steigert sie die Wirtschaftlichkeit des Lagercontrollings und der Unternehmenstätigkeit allgemein.

Anastasia Gubareva

L.I. Zvirkun, Fachbetreuer

I.A. Iaremenko, Sprachbetreuerin

Nationale Technische Universität "Dniprovskaya Polytechnika", Dnipro, Ukraine

Automatisierte Wasseraufbereitungsanlage für Schwimmbecken

Heute sind die Becken in zwei Arten durch die Methode der Zaun- und Wasserversorgung unterteilt: Skimmer und Überlauf. Skimmerpools sind die beliebtesten und bequemsten in unserer Zeit für Pools mit einer rechteckigen oder rechteckigen Form, aber begann Popularität zu gewinnen und gebaut aus der Zeit der Sowjetunion. Das Schema ihrer Arbeit ist ziemlich einfach und ökonomisch mit einer ziemlich hohen Qualität der Wasserreinigung.

Die Einführung der Automatisierung der Wasseraufbereitungsanlage des Schwimmbeckens hat eine bedeutende Wirkung, insbesondere in öffentlichen Schwimmbädern, wo ein großer Strom von Menschen mit verschiedenen möglichen Krankheiten vorhanden ist, der leider nicht kontrolliert oder verifiziert wird.

Die Prozessautomatisierung verbessert die Qualitätskontrolle chemischer Reagenzien und deren rechtzeitige Zugabe, um jegliches Risiko zu vermeiden. Automatisierte Systeme werden zu einem integralen Bestandteil neuer technologischer Prozesse und sind eine neue Etappe unserer Zeit.

Vor der Automatisierung der Kontrolle und der Phase der Wasseraufbereitung selbst wurde im manuellen Modus durchgeführt. Jetzt ist es unmöglich, sich diesen Prozess ohne automatische Steuerungs- und Kontrollsysteme vorzustellen. Solche Systeme erhöhen die Produktivität, verbessern die Qualität der Kontrolle und verringern die Möglichkeit eines Fehlers im menschlichen Faktor. Außerdem entlasten sie eine Person von der Arbeit und arbeiten mit schädlichen Reagenzien.

Ein wichtiger und unverzichtbarer Prozess der Wasseraufbereitung ist die Wasserfiltration, Temperatur- und Wasserkontrolle sowie die chemische Reinigung mit chemischen Reagenzien wie Chlor und Wasserstoff. Die richtige Kontrolle der Ausrüstung kann die überschüssige Reagensdispersion reduzieren und den Füllstand der Chemikalien für Besucher sicherer und sicherer kontrollieren.

Eine Möglichkeit, mit der die Mitarbeiter den Wasseraufbereitungsprozess steuern können, ist das Pool Control Panel: Der Navigator ist ein Standard und wird unter der Kontrolle der chemischen Reagenzien mit Hilfe eines Dosiersystems pH, Cl durchgeführt, wodurch die einfache Ausrüstung und die Anzahl der Bedienpersonen reduziert werden können und die Kontrolle über das Wasserprozessmanagement vereinfachen. Dieser Effekt kann durch Automatisierung der Gerätemanagement erreicht werden. In der Ukraine werden sowohl inländische als auch ausländische Geräte bei der Wasseraufbereitung von Schwimmbädern verwendet. Mangel an alter Ausrüstung - Mangel an Automatisierung und Fokus auf manuelle Steuerung. Es ist jetzt die Frage der Relevanz der Aufgaben der Automatisierung von Sportbecken, insbesondere Wasseraufbereitungsanlagen.

Diana Nevidnik

E.P. Pilova, Fachbetreuerin

I.A. Iaremenko, Sprachbetreuerin

Nationale Technische Universität "Dniprovskaya Polytechnika", Dnipro, Ukraine

Bedürfnispyramide als Marketinggrundlage

In der Theorie finden sich verschiedene Definitionen für Marketing. Die American Marketing Association probiert es zum Beispiel so: „*Marketing ist eine Aktivität, eine Reihe von Institutionen und Prozessen zum Erstellen, Kommunizieren, Liefern und Austauschen von Angeboten, die für Kunden, Partner und die Gesellschaft insgesamt wertvoll sind*“.

Ziel von Marketing ist es, einen Ansatz zu finden und Entscheidungen zu treffen, auf einem Markt zu bestehen um seine Produkte möglichst effizient zu vertreiben. Die Vermarktung einzelner Produkte oder ganzer Produktpaletten werden exakt und zielgerichtet gesteuert. Marketing ist in einem Unternehmen immer mit der Analyse, Planung, Umsetzung und Kontrolle von Unternehmensaktivitäten verbunden. Marketing ist also eine zentrale Funktion der Unternehmensführung und damit ein wichtiger Bestandteil der Betriebswirtschaft. Die Ware wird für die Gesellschaft nützlich sein, wenn sie mit einer Stufe in der Bedürfnispyramide von Maslow übereinstimmen wird. Maslow unterteilt die menschlichen Bedürfnisse in verschiedene Stufen. Die Bedürfnisse werden nacheinander dringlich. Das heißt, dass der Mensch versucht, die Bedürfnisse nacheinander zu befriedigen.

Die erste Stufe heißt physiologische Bedürfnisse. Physiologische Bedürfnisse werden auch Existenzbedürfnisse genannt, also all diejenigen Bedürfnisse, die überlebensnotwendig sind. Zum Beispiel Essen, Trinken und Schlafen. Auf der zweiten Stufe der Bedürfnispyramide befinden sich die so genannten Sicherheitsbedürfnisse, wie etwa das Bedürfnis nach körperlichem Schutz, das Bedürfnis nach Stabilität im Leben sowie das Bedürfnis nach körperlicher und mentaler Unversehrtheit. Die dritte Stufe nehmen die sogenannten sozialen Bedürfnisse ein. Zu den sozialen Bedürfnissen zählen das Bedürfnis nach Freundschaften und die Individualbedürfnisse. Zu den individuellen Bedürfnissen gehören in erster Linie das Bedürfnis nach dem beruflichen und persönlichen Erfolg, das Bedürfnis nach Anerkennung sowie das Bedürfnis nach einem gesunden Selbstvertrauen. Die oberste und letzte Stufe der Bedürfnispyramide nehmen die Bedürfnisse nach der Selbstverwirklichung ein. Zu den Bedürfnissen der Selbstverwirklichung gehört das Bedürfnis nach Kreativität und Spontaneität. Die einzelnen Stufen werden also nacheinander relevant. Wenn die Bedürfnisse einer Stufe befriedigt werden, wird der Mensch versuchen, die nächste Stufe der Bedürfnispyramide in Angriff zu nehmen. Generell werden die physiologischen Bedürfnisse, die Sicherheitsbedürfnisse sowie Teile der sozialen Bedürfnisse als sogenannte Defizitbedürfnisse bezeichnet. Die Bedürfnispyramide nach Maslow stellt eine relativ gute Möglichkeit da Bedürfnisse zu klassifizieren und findet in vielen Feldern wie etwa Marketing und während Personal und Organisationsentwicklung Anwendung.

Dmitry Tkachev

L.I. Zvirkun, Fachbertreuer

I.A Iaremenko, Sprachbetreuerin

Nationale Technische Universität "Dniprovskaya Polytechnika", Dnipro, Ukraine

MATLAB und Simulink

Das Simulink-Paket bietet die Erstellung von Modellen, in denen sich Subsysteme (Subsystem) befinden. Somit ist es möglich, ein komplexes System zu erstellen, das aus getrennten Modulen besteht, von denen jedes ein separates Gerät oder System ist. Dies bietet eine Reihe wichtiger Vorteile beim Modellieren:

- Das zu lösende Problem lässt sich in eine Reihe kleinerer Probleme aufteilen, die von Teilsystemen gelöst werden.
- Jedes Subsystem kann separat debugged und nach dem Debuggen im System verwendet werden.
- Das Basismodell wird vereinfacht, indem Blöcke in separate Module gruppiert werden;
- Es ist einfacher, das gesamte Modell zu modifizieren, indem Sie einfachere Subsysteme modifizieren.

Das MATLAB-System ist ein leistungsfähiges Programmierwerkzeug. Es hat einen eigenen Editor mit einem Programm-Debugger. Um die Arbeit mit dem Editor zu erleichtern, sind die darin enthaltenen Programmzeilen nummeriert.

Der Editor ist multi-windowed. Das Fenster jedes Programms ist als separate Registerkarte gestaltet. Es ermöglicht Ihnen auch, visuelle Programmierung durchzuführen. Der Editor / Debugger von m-files führt syntaktische Kontrolle des Programmcodes während der Texteingabe durch. Die folgenden Farbauswahlen werden verwendet:

- interne Funktionen von MATLAB - blau;
- Operatoren, Konstanten und Variablen sind schwarz;
- Kommentare - grün;
- Zeichenvariablen (in Apostrophen) - Bardenfarbe;
- Syntaxfehler sind rot.

Aufgrund der Farbzuordnung wird die Wahrscheinlichkeit von syntaktischen Fehlern signifikant reduziert.

Es ist eine Regel des guten Tones, in m-files ziemlich detaillierte Textkommentare einzutragen. Beim Schreiben eines Programms werden Textkommentare mit dem Zeichen% eingegeben.

Vom Editor / Debugger erstellte m-Dateien sind in zwei Klassen unterteilt:

- Prozedurdateien (oder Skriptdateien), die keine Eingabeparameter haben;
- Funktionsdateien mit Eingabeparametern.

Die Dateiprozedur ist einfach eine Aufzeichnung einer Reihe von Anweisungen ohne Eingabe- und Ausgabeparameter. Szenario-Dateien sind Programme, die nur Ausgabeparameter haben. Um die Prozedurdatei über die MATLAB-Befehlszeile auszuführen, müssen Sie nur ihren Namen in dieser Zeile angeben: >> diagrammi.

K.V. Vovchenko

V.V. Nadotchii, Fachbetreuer

I.A. Iaremenko, Sprachbetreuerin

Nationale Technische Universität "Dniprovskaya Polytechnika", Dnipro, Ukraine

Die Entwicklung der Robotik in unserer Zeit

Eine der wichtigsten wissenschaftlichen Entwicklungen der Menschheit sind Roboter. Während sie vor einigen Jahrzehnten nur als Fantasiefrüchte der Science-Fiction-Autoren galten, sind sie jetzt ein unentbehrlicher Teil unseres Lebens. Sie werden in vielen unterschiedlichen Bereichen eingesetzt und übernehmen die Tätigkeiten und die Aufgaben, die für den Menschen gefährlich sind oder die vom Menschen kaum ausführbar sind. Sie helfen auch viele Prozesse schneller, präziser und effizienter durchzuführen.

Es ist wirklich schwer, alle Einsatzgebiete der Roboter im modernen Leben aufzuzählen. Einer der wichtigsten Gebiete ist der Einsatz der Roboter in der Weltraumforschung. Ohne Roboter wären die Erforschungen z.B. vom Mars und von der Venus undenkbar, weil sie bei extrem niedrigen Temperaturen arbeiten können. Sie erforschen die Oberfläche der Planeten und helfen bei der Reparatur der defekten Satelliten. Roboter werden ebenfalls erfolgreich zu militärischen Zwecken weiterentwickelt. Sie werden zum Aufspüren, Entschärfen oder Sprengen von Bomben oder Minen eingesetzt. Unerlässlich sind auch die künstlichen Helfer in den Krisengebieten. Sie leisten wertvolle Hilfe bei Bränden, Erdbeben und Überschwemmungen, weil sie sich auf unwegsamen und unzugänglichen Territorien fortbewegen können.

Noch ein wichtiger Einsatzbereich der Roboter ist Medizin. Mit Hilfe der Roboter werden in Labors Zellkerne erforscht oder Mikrochips bearbeitet werden. Die Roboter helfen auch die kompliziertesten Operationen durchzuführen. Viele Industrieabläufe Industrie könnten ohne Einsatz der Roboter nicht verwirklicht werden. Es gibt heute weltweit zwei Millionen Industrieroboter und rund 30 Millionen Serviceroboter – von Staubsaug- und Rasenmäh- bis zu Ernte-Robotern oder rollenden Regalen in Warenlagern.

Menschen und Roboter – Kollegen oder Konkurrenten? Es ist unbestritten, dass die Entwicklung des modernen Zeitalters sowie der Wohlstand der Industrieländer eng mit der Entwicklung von Robotern und Computerprogrammen verbunden sind. Aber es gibt auch negative Seiten. Produktionsabläufe lassen sich zwar schneller, flexibler und präziser gestalten, aber der technische Fortschritt minimiert eine große Anzahl an Arbeitsplätzen. Es gibt auch viele andere Vor- und Nachteile. Trotzdem sind Roboter sehr gefragt. Es gibt viele Ängste im Zusammenhang mit Robotern, die in vielen Science-Fiction-Romanen beschrieben werden. Dennoch steht die Entwicklung nicht still. In der Zukunft wird Automatisierung viele Früchte bringen, die sowohl bei der Produktion und dem Studium der Welt als auch im persönlichen Leben jeder Person nützlich sein werden.

Konstantyn Zajarny
V.A. Boroday, Fachbetreuer
I.A. Iaremenko, Sprachbetreuerin
Nationale Technische Universität "Dniprovskaya Polytechnika", Dnipro, Ukraine

Elektroenergie-technik, Elektrotechnik und Elektromechanik

Das Fachgebiet Elektromechanik umfasst die Umformung elektrischer und mechanischer Energie. Auch in der Zeit modernster Mikroelektronik sind Maschinen und Anlagen ohne elektromechanische Bauteile sind undenkbar. Sie sind sowie ein wichtiges Bindeglied zwischen dem Bediener und der Maschine als auch verbinden sie die Maschine mit der elektronischen Steuerung. Als wichtige Beispiele dafür kann man rotierende elektrische Linearantriebe, Maschinen und magnetische Lager anführen. Anwendungen von Magneten einschließlich aktiver magnetischer Lager basieren auf den grundlegenden Zusammenhängen der Kraftbildung in einem magnetischen Kreis.

Das magnetische Schweben ("Magnetic Levitation") ermöglicht hervorragende Führungsgenauigkeit in der Ebene sowohl linear als auch rotativ: Der passive Läufer schwebt auf einem magnetischen Feld und wird durch dieses aktiv geführt. Mit Hilfe von hochpräzisen Sensoren können Fehler in unterschiedlichen Arbeitsabläufen gemessen und geregelt werden. Im Gegensatz zu den ebenfalls hochgenauen Luftlagern können magnetische Lager auch im Vakuum verwendet werden.

Neue Perspektiven bieten hochpräzise magnetische Direktantriebe, da sie weitgehend auf mechanische Komponenten verzichten: weniger Reibung und Spiel, mehr Präzision! Der Torquermotor besitzt alle Vorteile, die für Direktantriebe im Vergleich zu klassischen Systemen der Übertragung auszeichnen. Der rotatorische Direktantrieb eignet sich deswegen vor allem für hochperformante Bewegungsaufgaben.

Direktantriebe erregen in den letzten Jahren immer größeres Aufsehen in der Öffentlichkeit. Bei den rotatorischen Direktantrieben sind das vor allem die Torquerantriebe, die immer mehr verbreitet werden und immer größere Rolle spielen. Der Direktantrieb wird beim Antrieb von Fahrzeugen genutzt. Mit Hilfe von Elektromotoren können die Räder von Fahrzeugen ohne Getriebe in Bewegung gesetzt. Auf solche Weise kann auch ein Propeller von einem Verbrennungsmotor betrieben werden.

Bei Verbrennungsmotoren ist, wenn ein Antrieb über die Räder erfolgen soll, ein Getriebe oder eine hydraulische- oder elektrische Kraftübertragung möglich. Direktantriebe erfordern speziell konstruierte Motoren, die nicht nur spezielle Drehzahlen erzeugen, sondern oft auch robustere Lager besitzen müssen, um zusätzliche Lagerkräfte oder Auswuchten aufzunehmen. Daher können sie nur bei in hohen Stückzahlen gefertigten Produkten eingesetzt werden. Ohne Elektromotoren und elektrische Antriebe ist unser modernes Leben nicht mehr vorstellbar. Elektromotoren werden in der Industrie vielfältig eingesetzt. Die Auswahl der elektrischen Antriebe richtet sich nach dem Einsatzzweck. Die Kriterien dafür sind recht unterschiedlich.

Section 06. French language section

Maxime Coutant
Y. Soldatenko, A. El Albani, superviseurs de recherche
Université de Poitiers, France

Etudes du Biota Ediacarien Ukrainien

Ce travail avait pour le but l'identification de différents échantillons de fossiles et l'analyse de faciès sédimentaires. Les échantillons proviennent de l'Ukraine de l'Ouest qui est connu pour ces sédiments datant de l'Ediacara. Cette époque est une période charnière dans l'évolution de la vie sur Terre.

Suite au « Great Oxydation Event », l'oxygène dans l'océan devient plus important et est à la base de la première radiation évolutive des eucaryotes pluricellulaires. Les fossiles édiacariens sont donc cruciaux dans l'explication de la vie au Phanérozoïque, mais ils restent relativement peu décrits dans la littérature de par la complexité des différents modes de conservations des spécimens, bien que nous retrouvons principalement des ichnofossiles (traces) ainsi que des bioturbations qui sont donc de meilleurs témoins de l'existence de ces organismes.

Dans le cas de l'étude du biota Ukrainien, les fossiles sont formés dans un sédiment silico-clastique, silto-gréseux, ce qui rend ce mode de fossilisation exceptionnel. Plusieurs hypothèses permettent d'imaginer un scénario adéquat, soit par remplacement des parties organiques par le sédiment et compaction de la roche, soit par dissolution des minéraux par le corps mou et recristallisation.

Au cours de ce stage on a donc essayé de quantifier, identifier et nommer les différents spécimens afin de les inscrire dans un futur projet de recherche. Les organismes étaient globalement de forme arrondis et donc pourrait s'apparenter à des méduses actuelles. Malgré tout, on peut identifier certaines spécificités propres à chaque genre de fossile selon l'Atlas d'Ivantsov.

De plus, on a également fait une analyse pétrographique des roches sédimentaires sur plusieurs échelles (macro et microscopique). L'identification des structures sédimentaires spécifiques, comme les HCS (hammocky cross stratification), interstratifiés, entrecroisés, nous renseigne sur l'environnement hydrodynamique du milieu. A cela on a couplé une observation de lame mince afin de mesurer la taille relative des grains et les différents types de contacts entre eux, qui nous renseigne sur les effets post dépôts - diagenétiques.

Enfin, certains échantillons présentant des voiles bactériens, ces derniers pouvant jouer un rôle dans la conservation de forme sédimentaire comme des rides de courants. Ces voiles bactériens peuvent également modifier la chimie des minéraux à l'échelle atomique, ce qui peut changer le comportement des minéraux dans la diagénèse. Cela nous donne une nouvelle idée du domaine de formation de ces roches sédimentaires ainsi que les altérations subit par les sédiments.

Ben-Spirithou Ngouala

V. Soldatenko, I. Mendrii, superviseurs de recherche

Y. Soldatenko, conseiller linguistique

Université nationale polytechnique de Dnipro

Interprétation des méthodes complexes liées à la géophysique

Le travail présenté ici est le résultat d'un laboratoire sur l'interprétation des méthodes complexes liées à la géophysique. Après les différents processus de travail, sur des logiciels spécifiques à cet exercice comme Surfer, nous avons obtenu une carte graphique faite de plusieurs couleurs que nous avons superposé sur la carte d'origine (**Figure 1**) pour comparaison et interprétation.

Le constat que nous faisons est que: la carte d'origine est subdivisée en zones tectoniques formées de différentes roches comme le gneiss et granite. La ligne verte correspondant au système de contact stratigraphique et intrusif, est orientée entre (315°, et 45°) et, fait office de frontière avec la zone stratigraphique C2B.

La seconde zone tectonique celle des différentes failles correspondant à la ligne marron, est essentiellement constituée de granites, migmatite et aplitite. Cette zone est orientée entre 77° et 347°. Au Nord-Est de la carte nous retrouvons la structure géologique (PR1tb1) (essentiellement constituée de gneiss à biotite et de granite à biotite), cette structure géologique est à l'intersection des axes de directions 315°, 45° et 90°. La structure géologique (PR2in) se situant dans la même zone géographique que la précédente est constituée de gneiss à pyroxène et du plagioclase à pyroxène, traversée par des axes parallèles de 247° et se trouve à l'intersection des axes de 90° et 45°.

Par contre, les structures (PR1) qui se situent au Sud de la carte sont formées de granites, migmatites et aplitite sont l'une à la croisée des axes de 45° et 315° et l'autre traversée par les axes 315°, 45° et 17°.

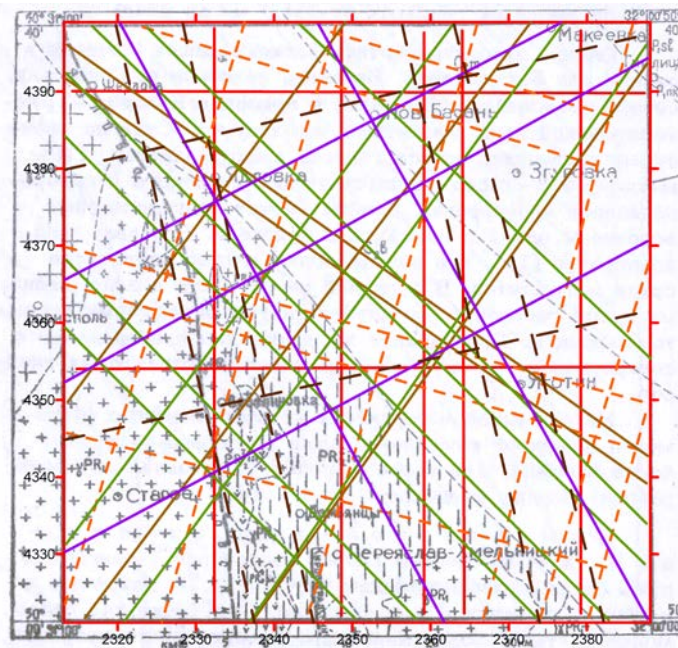


Figure 1 - Carte tectonique de la zone de travail avec les directions sélectionnées en fonction de linéarité

Alexander Posevin
I.O. Herasymova, superviseurs de recherche
I.O. Herasymova, conseiller linguistique
Université nationale polytechnique de Dnipro

Les problèmes environnementaux et les solutions

La planète fait face à une variété de problèmes troublants qui découlent de la contamination par l'homme. Beaucoup d'entre elles entraînent des problèmes environnementaux qui causent des dommages à long terme à l'écosystème terrestre.

La pollution de l'environnement consiste en cinq types de pollution de base, à savoir l'air, l'eau, le sol, le bruit et la lumière.

La pollution de l'air est de loin la forme la plus nuisible de la pollution dans notre environnement.

La pollution de l'air est causée par la fumée nuisible émise par les voitures, les bus, les camions, les trains. La pollution de l'air peut en outre être classée en deux sections: pollution de l'air visible et pollution de l'air invisible. Une autre façon de considérer la pollution de l'air pourrait être n'importe quelle substance qui détient le potentiel d'entraver l'atmosphère ou le bien-être des êtres vivants qui y survivent. Le maintien de toutes les choses vivantes est dû à une combinaison de gaz qui forment collectivement l'atmosphère; le déséquilibre causé par l'augmentation ou la diminution du pourcentage de ces gaz peut être nuisible à la survie.

Il y a plusieurs solutions pour la pollution de l'air. Le premier est utilisation le mode de transport public. Encourager les gens à utiliser de plus en plus de modes de transport public pour réduire la pollution. Le deuxième est conservation l'énergie. Éteignez les ventilateurs et les lumières lorsque vous sortez. Vous pouvez sauver l'environnement de la dégradation en réduisant la quantité de combustibles fossiles à brûler. Le troisième est compréhension le concept de Réduire, Réutiliser et Recycler. Ne jetez pas les objets qui ne vous sont d'aucune utilité. Le quatrième est l'accent mis sur les ressources énergétiques propres. Les technologies d'énergie propre comme l'énergie solaire, l'énergie éolienne et l'énergie géothermique sont très répandues ces jours-ci.

La pollution de l'eau est un problème croissant à l'échelle mondiale. Les grandes industries, y compris celles qui fabriquent des produits chimiques et des plastiques, déversent une grande quantité de déchets dans l'eau. Les déchets humains et les déchets finissent également dans les océans et les lacs. Pour résoudre le problème, les particuliers peuvent améliorer le recyclage et l'élimination des déchets. Les entreprises devraient développer des protocoles en cours pour réduire la quantité de produits chimiques et autres déchets qu'ils mettent dans l'approvisionnement en eau.

Le prochain problème est contamination du sol. Les produits chimiques artificiels rejetés dans la terre par accident ou par de mauvaises techniques d'élimination provoquent une contamination du sol. La rupture des réservoirs de stockage souterrains, les pluies acides, la lixiviation des déchets dangereux des sites

d'enfouissement, les pesticides et les herbicides et les rejets de déchets chimiques industriels peuvent contaminer le sol dans lequel les agriculteurs cultivent ou broutent le bétail. Les lois contre une telle contamination doivent être strictes, et les agences appropriées doivent être strictes dans l'application de ces lois pour aider à garder le sol plus sûr pour les humains et les animaux.

Puis, le problème de déchets dangereux est très important. La mauvaise manipulation des déchets dangereux pose des risques immédiats et à long terme pour les plantes, les animaux, les humains et l'environnement. Les particuliers et les entreprises devraient s'assurer que les spécialistes en élimination des déchets dangereux manipulent tous les déchets dangereux et ne devraient jamais déverser les déchets dangereux avec des déchets ordinaires ou dans des rivières ou des fossés.

La pollution sonore, la pollution des sols et la pollution de la lumière constituent aussi l'environnement dommageable à un rythme alarmant. La pollution sonore comprend le bruit des avions, le bruit des voitures, des autobus et des camions. Pour résoudre ce problème, vous pouvez éteindre vos appareils électroniques. Ensuite vous pouvez insonoriser votre espace.

Il y a beaucoup de choses que vous pouvez faire pour réduire le bruit à la maison (ou peut-être votre lieu de travail). Si vous avez des planchers durs, les tapis iront un long chemin dans la lutte pour amortir le son.

Les fenêtres sont un point faible connu dans de nombreuses structures. Installer de meilleures fenêtres, sceller les cadres de fenêtres ou suspendre des rideaux (même fins) aidera à réduire le bruit venant de l'extérieur. Essayez aussi de faire fonctionner des appareils électroménagers comme des lave-vaisselle et des machines à pain lorsque vous vous préparez à quitter la maison un peu. Quand vous êtes parti, ils peuvent faire autant de bruit qu'ils le veulent. Puis, les boules quies. Parfois, les solutions les plus simples sont les plus efficaces. Si le bruit de la nuit vous tient éveillé, les bouchons d'oreille pourraient être votre billet pour un sommeil doux. Assurez-vous de régler votre alarme assez fort. Les bouchons d'oreille peuvent également être géniaux si vous allez à un événement bruyant ou un concert. Ils ne bloquent pas tout le bruit. Au contraire, ils ramènent les sons à un niveau gérable.

Yevheniia Soldatenko

A. El Albani, M. Ruzina, superviseurs de recherche
Université nationale polytechnique de Dnipro

Lithostratigraphie et sédimentologie dans le bassin de Podolya (SW Ukraine)

Dans le bassin de Podolya, situé sur la bordure sud-ouest de l'Ukraine, l'étude du Néoprotérozoïque (Vendien) est rendu difficile par la présence des terrains quaternaires dont la puissance peut atteindre 50 m et qui masquent aussi bien la surface précambrienne que le socle archéen. Les affleurements vendiens et cambriens sont donc essentiellement visibles dans les vallées méandriformes du Dniestr et de ses affluents qui incisent profondément la couverture quaternaire. Avant la construction du barrage hydroélectrique, les versants de ces vallées permettaient d'observer la totalité des formations néoprotérozoïques ; ce qui n'est plus possible aujourd'hui après l'ennoïement d'une partie du réseau hydrographique. Aussi, afin d'établir une lithostratigraphie complète du Vendien supérieur jusqu'au Cambrien inférieur, il est donc nécessaire de se reporter aux travaux antérieurs (descriptions d'affleurements et sondages).

Le bassin de Podolya constitue la partie orientale de la Plateforme européenne en contact avec le bouclier ukrainien. Dans ce domaine du Sud-Ouest de l'Ukraine, la couverture sédimentaire reposant sur le socle débute par des terrains néoprotérozoïques, regroupés dans le système vendien, et se poursuit jusques aux strates du Cambrien Inférieur, dont les faunes ont fait l'objet d'études paléontologiques. Cette succession temporelle peut-être suivie en se déplaçant d'Est en Ouest sur la bordure du bassin. Le Néoprotérozoïque est toutefois restreint à sa partie supérieure, appelée Ediacarien depuis 2003 dans la systématique internationale. Dans la géologie régionale, le système Vendian, constitué essentiellement de dépôts terrigènes, est classiquement divisé en trois séries nommées : Volynska, Moguilive-Podilska, Kanilivska.

Du point de vue structural, la couverture sédimentaire, composée d'une séquence stratigraphiquement quasi continue depuis le Vendien jusqu'au Silurien, est une série monoclinale, reposant en concordance sur le socle cristallin.

Parfois, les sédiments Vendiens pointent sous la surface pré-mésozoïque au gré de dépressions du relief. La position topographique diminue progressivement en se déplaçant du Nord-Ouest vers le Sud-Est et le Sud-Ouest, où ils sont recouverts par les sédiments cambriens, ordovicien puis siluriens.

Les dépôts cambriens reposent transgressivement sur les terrains néoprotérozoïques (Vendien). A la base, ils sont composés d'argilites et de grès quartzo-glauconieux. Ces grès sont très hétérogènes en terme de la granulométrie, et leur couleur dominante est le gris verdâtre. Les teneurs en quartz atteignent 70%, tandis que celles en glauconie ne dépassent 3-5%. Vers le haut, les faciès deviennent argileux avec les intercalations du matériau gréso-pélitique.

En concluant, il faut noter que la transition Précambrien-Cambrien reste assez discutable dans le bassin de Podolya ainsi que sur les autres sites à travers du monde entier.

Section 07. Challenges in Environmental Protection

Sergey Artuyshenko
O.O. Yavorska, research supervisor
L.A. Zayika, language adviser
National TU «Dnipro Polytechnic», Dnipro, Ukraine

Analysis of Land Reclamation Methods

Recultivation is a set of measures for the ecological and economic restoration of lands and water resources, the fertility of which as a result of human activity has significantly decreased. The purpose of the reclamation is to improve the environmental conditions, restore the productivity of disturbed lands and reservoirs.

As a result of economic activity, the disturbed territories are divided into two groups:

1. Lands damaged by bulk ground, dumps, hydro dumps, waste pits and dumps;
2. Areas damaged by excavation, open pit mines, extraction of local building materials and peat, dips and deflections at the site of underground mining, reserves and trenches in the construction of linear structures.

Thus, it caused the need to rejuvenate this area with a corresponding variety of plant species.

One of the main priorities should be the adoption of rational methods of ecological restoration.

For various types of excavations there are correspondingly different types of reclamation.

For dry quarries, the following work is performed:

1. Planning works on surface formation;
2. Transportation from a warehouse and application of a soil-vegetative layer;
3. Reclamation and sowing of herbs in the prepared territory.

Reclamation of watered quarries.

Recultivation of watered quarries is carried out as follows:

1. Planning works on surface formation;
2. Filling the pit with water. After that, dry quarries can be used as sites for construction, pasture, afforestation, etc. A watered quarry is used as a reservoir for different purposes.

Reclamation of stone quarries.

Reclamation of stone quarries, the process of processing them for a territory that can be used for economic purposes, is more difficult. Because the soil is not intended for biological reclamation.

In such situations, the following types of work are carried out:

1. Planning works on surface formation;
2. Filling of loose overburden and soil;
3. Sowing of seeds;
4. Reclamation of the developed areas of peat deposits.

Reclamation of dumps

When reclaiming dumps, the following types of work are performed:

1. Removal of the soil-vegetation layer on the site of the falling dump, transport and storage in convenient places for subsequent use;
2. Formation of slopes of the heap;
3. Planning works on the formed surfaces;
4. Transportation from a warehouse and application of a soil-vegetative layer on the formed and planned surfaces;
5. Construction of special purpose roads, reclamation;
6. Devices of special hydraulic structures if necessary;
7. Seeding of seeds.

Reclamation of peat deposits

The possibility of using the developed peat bogs after reclamation depends on the methods of peat extraction, water regime, age of production. Recultivation of such deposits takes place in three stages.

1. Establishment of a drainage and humidification system that ensures a rapid drainage of water with areas during wet periods and moistening of the root layer of the soil during droughty periods, and also ensuring moistening of the root layer of the soil through sluices during the vegetation period;

2. Conducting cultural, technical and planning works. In parallel we work on reclamation in the fields build roads, and when reclamation of peat quarries roads are built only after the performance of planning works;

3. Performance of cultural and technical works. Their main task is the clearing of areas from woody and shrubby vegetation. Clearing, as a rule, consists of ripping, cutting, milling and scaling.

Thus, for any type of mining operations, regardless of the minerals and methods of its occurrence, the most effective method of reclamation can be selected.

Tetiana Bas

V.V. Protsiv, research supervisor

M.L. Isakova, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Possibilities and Advantages of Hybridization of the Domestic Car "Sens"

Growing amount of cars in the cities has had a massive negative impact on the environment. So, the technologies of hybridization of budget front-wheel-drive cars with an internal-combustion engine have been of interest for the last few years.

It is known that the car is a massive and most widespread vehicle and, at the same time, one of the main sources of environmental pollution. Fuel cost represents a significant proportion of the total cost of the average family, which owns a car. The efficiency of businesses whose main area of activity is transport services is also significantly dependent on fuel costs. Thus, even a small reduction in fuel consumption by vehicles significantly improves the economic performance of enterprises and individual citizens.

Meanwhile, the conventional cars technology based on internal combustion engines is developed, in fact, completely. The modern internal combustion engine has a useful efficiency ratio of 25-35%, which is in the theoretical maximum zone. Further improvement cannot lead to a significant increase in the efficiency factor. At the same time, the use of an electric vehicle is economically unjustified. This is due to the lack of infrastructure for charging batteries, and, in fact, most batteries are of insufficient capacity [1].

Thus, the solution of economic and environmental issues in the field of motor transport requires a fundamentally new approach. Namely, the use of a combined power plant (hybrid drive) is one of the solutions to this problem [2]. First, the tendency to switch to a hybrid type of cars is due to the efforts of the leading countries of the world to reduce their own dependence on suppliers of petroleum products. Secondly, environmental aspects are becoming more and more critical with the increasing number of cars in the world.

However, while hybrid cars combine the benefits of cars with internal combustion engine and electric vehicles, they have a high cost.

We have developed a new hybridization technology for budget front-wheel drive cars with an internal combustion engine. At the initial stage of the study, we made changes to the design of the rear suspension of the car. Next, we investigated the dynamic processes taking place in the suspension of a hybrid car, and determined the rational parameters. It has been established that the optimal structure of a hybrid vehicle is a parallel configuration in which the vehicle is simultaneously driven by an internal combustion engine and an electric motor. From a technical point of view the most rational use of motor-wheels is with synchronous motors with permanent magnets. We conducted an experiment that consisted in measuring the amount of emissions of harmful substances into the atmosphere at different speeds of a hybridized car "Sens".

We assumed that a hybridized car pollutes the environment less than a car with an internal combustion engine. The experiment included the following steps. First we installed a gas analyzer in the car's interior and put a sampling tube of the exhaust pipe for the gas analyzer. Then we connected the gas analyzer to the power supply of the car. Then we connected the personal computer to the gas analyzer and turned it on. After that, we warmed up the gas analyzer and launched the software for the personal computer. We measured the amount of harmful substances released into the atmosphere when the hybrid car was moving at different speeds.

The experiment showed that the content of substances is not harmful to the environment, increases with the speed of the vehicle. While the amount of harmful substances decreases.

Also, studies have been carried out to determine the fuel consumption of the hybridized vehicle "Sens" at various speed modes.

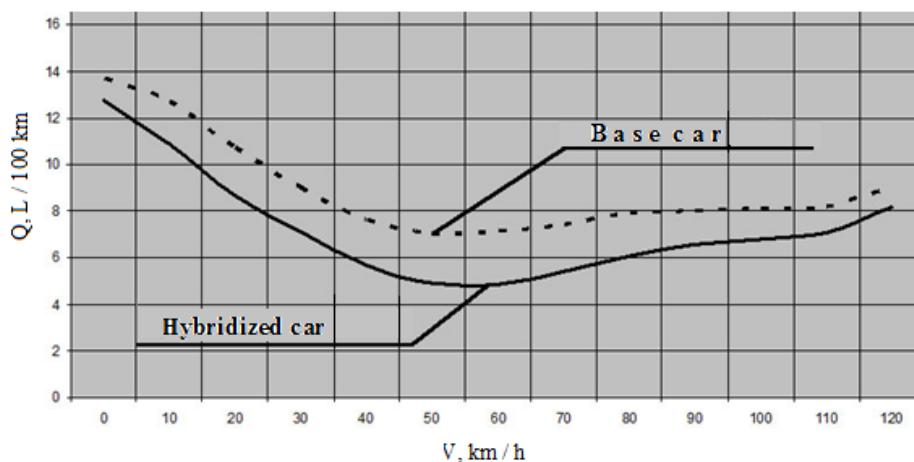


Fig. 1. Graph of the fuel consumption dependence by the hybridized car on the speed.

After processing the data obtained during the experiment on the measurement of fuel consumption at different speeds, the average fuel consumption was 7.3 L/100 km, which is 20.9% less than the fuel consumption of the base car (9.0 L/100 km). The fuel consumption graph is presented in Fig. 1.

The forms of the curve of the fuel consumption dependence graph on the hybridized and base car differ not significantly in qualitative terms. However, the quantitative difference reaches 27% at a speed of 55-60 km/h.

Thus, we received a full-drive, relatively inexpensive vehicle, which is less fuel consuming and not so damaging to the environment.

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Ivan Borshch

S. I. Fedorov, research supervisor

L.A. Zaika, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Role of Fossil and Renewable Fuels in the Future Ukraine Energy System

Issues of energy security of Ukraine were discussed as one of the key conditions for the stable existence and economic growth of our independent state. The available resource potential can fully meet the needs of Ukraine in the event of an urgent increase in the resource base of fossil and renewable fuels.

An important place in the energy sector of a number of countries, especially the European Union, is renewable energy sources. Ukraine has significant potential for the development of renewable energy, the main promising directions should be the development of bioenergy, solar energy and the use of the hydropotential of small rivers in Ukraine.

In recent years, energy systems in most countries around the world are approaching a major crisis. Safety issues are associated with the depletion of natural resources, primarily energy, the control of their production and transportation routes. The global pursuit of energy independence, environmental friendliness, and global price volatility force each country to choose its unique way, given its own resources and historical experience.

Natural gas is still one of the most attractive types of fuels in many countries in the electricity generation and industry sectors, since its consumption is rather environmentally friendly.

Ukraine's energy strategy implies a significant increase in domestic production. One of the key issues is to ensure a regular increase in hydrocarbon reserves, which would not only cover the amount of raw materials extracted in Ukraine but also create a certain reserve for the future. In order to significantly and rapidly increase oil and gas production in Ukraine, it is necessary to open large and significant reserves (over 30 million tons of equivalent fuel) of deposits at great depths and underdeveloped territories. Particularly acute today is the question of extraction of hydrocarbons from non-traditional deposits, in particular gas of sealed rocks, shale gas, gas-methane coal deposits, shale oil and gas hydrates. The projected resources of these non-traditional hydrocarbons in Ukraine are: shale gas 1-1.5 trillion m³, gas of dense rocks in the western region -1-2 trillion m³, in the eastern region - 3-8.5 trillion m³, total resources of coal mine methane - 1.8-12 trillion m³, gas resources of the deep sea part of the Black Sea shelf - 4-13 trillion m³, projected resources of hydrated gas in the Ukrainian sector of the Black Sea - 7 trillion m³.

The consumption of a huge amount of energy in the United States led to the rapid development of technologies, which allowed the country not only to satisfy its domestic market, but also gradually become a very influential exporter, mainly due to the extraction of hydrocarbons, especially in shale deposits.

Renewable energy sources (RES) cease to be alternatives. So far, their share in the world is about 15%. Among the countries that are the most intensively developing technologies and markets RES is SPED, the EU countries (first of all, Sweden,

Austria, Finland, Germany, Portugal, Spain), Japan, China. According to the EU Directive on stimulation of RES, it is foreseen a mandatory increase in the share of alternative energy sources in electricity generation up to 20%. State support is the basis for the implementation of renewable energy development programs. Ukraine has significant potential for renewable energy development - all regions of the country have the potential to use RES. Among the priorities are bioenergy, wind turbine, small hydropower, solar and geothermal power, which today have real chances to successfully develop.

Such bioenergy resources as forest wastes, agriculture, household waste, specially cultivated biomass (rape) in Ukraine are widespread. they can be used both for direct burning and for the production of biogas, biodiesel, bioethanol, solid fuel briquettes, etc. So far, this kind of energy has not been found appropriately applied in the Ukrainian energy market due to the lack of technical specifications and regulations for the production, storage, use, but technological developments and equipment of Ukrainian producers are widely sought after abroad.

Ukraine has its own development and industrial production of wind power plants (VEU), but low technical and economic efficiency still does not allow to compete with traditional types of energy. It is necessary to increase the capacity of the wind turbine and attract private capital for investing in wind power.

There are sufficiently favorable conditions for the use of solar energy in Ukraine. The most widespread use of solar energy has been found in heat supply systems. They serve for hot water supply, heating and other needs, which significantly reduces the use of traditional fuel resources. Solar power engineering in Ukraine has been developing quite recently (since 2010), and the potential has steppe areas. However, the main problem is the high cost of photovoltaic cells, most of which are exported. Ukraine has a significant potential for using small river resources, accounting for almost 28% of the total hydropotential of all the years of Ukraine. In particular, it will solve the problems of energy supply in remote and hard-to-reach areas of the countryside. The main advantages of small hydroelectric power stations are relative ease of construction and high ecological compatibility, which do not require the presence of large reservoirs, it is also possible to operate them in a fully automatic mode without permanent staff. Small hydro power plants can become a powerful basis for energy supply for all regions of Western Ukraine; according to scientists, the rapid flooding of the Carpathian Mountains is able to meet the region's demand for electricity by about 15%, and for some regions of the Transcarpathian and Chernivtsi regions it is a source of complete energy supply.

In spite of the gradual depletion of fossil fuel reserves, in the next 15-20 years they will remain the main source of the world energy system, as non-traditional sources, at their present level of development, can't become the basis for energy self-sufficiency in the region. The existing potential of traditional fossil and renewable energy resources in Ukraine allows in the near future to significantly increase the growth rates of their use, creating conditions for stimulating investment activity in this area, for example, from leading countries of the world.

Tetiana Deriabkina

I. I. Klimkina, research supervisor

S. I. Kostrytska, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Prospects for Using *Ideonella sakaiensis* 201-F6 for Recycling Plastic in Nature

The problem of plastic decomposition in nature is very up-to-date at the moment. The use of specific strains of microorganisms for these purposes is a promising direction of research.

Chemists from Japan have discovered a new kind of bacteria (*Ideonella sakaiensis* 201-F6), which are capable of decomposing plastic. Polyethylene terephthalate is its most common form. They were found during the screening of soil, water and silt samples taken from the place of processing bottles consisting of PET in Sakai, Japan.

Ideonella sakaiensis 201-F6 uses polyethylene terephthalate in its carbon and energy metabolism. Bacteria secrete two enzymes that decompose this compound (polyethylene terephthalate) to environmentally safe terephthalic acid and ethylene glycol. These gram-negative, aerobic and rod-like bacteria can promote the decomposition of the film from Poly (ethylene terephthalate) for 6 weeks at a temperature of 30 ° C under the action of its enzymes. This is quite a long time. A huge number of bacteria will be required. Besides, other types of plastic require recycling i. e. mixed with paper, aluminum and other impurities.

In the future study, it is necessary to accelerate the process, for example, by integrating the identified genes of the *Ideonella sakaiensis* 201-F6 bacteria involved in the decomposition of plastics into a rapidly multiplying bacterium like *Escherichia coli*. It is also possible to cross genes of the filamentous fungus *Fusarium oxysporum* [en], which can grow on a mineral medium containing Poly (ethylene terephthalate) filaments, or *Pestalotiopsis microspora* [en], capable of absorbing polyurethane. It is necessary to have several types of such microorganisms for different types of debris, and in accordance with it a different kind of final product.

After the planned partial-synthetic strain of bacteria, it is mandatory to control the population of this bacterium and its further existence in the environment. This study offers incredible prospects for processing waste and debris with the help of living organisms. The bacterium *Ideonella sakaiensis* 201-F6 will help to get rid of millions of tons of plastic debris in the World Ocean, turning it into an ecologically safe part of the environment.

No longer do we need to dig in or burn garbage. It will become a useful fertilizer for our soil. This small microorganism makes a big step towards the preservation of our planet Earth.

Kateryna Kalinina

O.S. Kovrov, research supervisor

S.I. Kostrytska, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Investigation of the Mercury Contamination Via Vegetation Tests

Among the pollutants of the biosphere, which are of greatest interest to various quality control services, heavy metals present the most important environmental issue. The special interest to researchers poses the group of the most toxic metals–xenobiotics such as mercury, lead and cadmium.

The penetration of heavy metals into the environment has both natural and anthropogenic origin. In the air, heavy metals are presented in the form of dust and aerosols of organic and inorganic compounds but mercury mainly exists in elemental state. Metals and their compounds in air are washed out by atmospheric precipitation or settle naturally on the surface of soil and plant cover.

Mercury is a heavy metal, which under normal conditions appears in a liquid aggregate state. In recent years, the annual production of mercury is 10 thousand tons. The enterprises, where mercury is one of the elements of the production cycle, include electronic, electrotechnical industries, chemical industries (fungicides, dyes, chlorine, caustic soda, etc.), as well as various branches of medical equipment, industrial and household appliances. Intoxication with mercury causes damage to the nervous and cardiovascular systems, disorders of the digestive tract, metabolic processes, disorders of the endocrine glands, etc.

To study the toxic effects of mercury on plants, laboratory experiments with plant-bioindicators were conducted at the Department of Ecology and Environmental Protection Technologies. For the vegetation tests, the set of Petri dishes were used for planting seeds of wheat and mustard. Seeds were irrigated with a solution of mercuric chloride in increasing concentrations. The volume of a single application of the solution is 20 ml. A series of dilutions for irrigation have been prepared, which contain different concentrations of mercury in relative units of maximum permissible concentration (MPC): 0.1, 0.25, 0.5, 1.0, 2.0, respectively. During the 14 days of the experiment, the growth of plants was observed in comparison with the control dish, in which the seeds were watered with distilled water. After 4 waterings, taking into account evaporation of water from Petri dishes and absorption of the solution by plants, the accumulation concentrations of mercury in MPC units collect 0.4, 1.0, 2.0, 4.0, and 8.0 MPC, respectively. An explicit effect of inhibiting plant growth with increasing mercury concentration has been established. The vegetation tests revealed the following results. When compared with the control sample in the dishes with dilutions of mercury the number of sprouted seeds decrease by 5%, 15%, 20%, 35%, 40%, respectively. The decrease in the average length of roots and plant sprouts compared with the control probe was 15%–40%, respectively, which is due to the inhibition of growth rates. The received results allow us to understand more deeply the effect of environmental pollution by heavy metals and their influence on growth indices of plants.

Diana Kazbinova

A.V. Kochenov, research supervisor

N.V. Poperechna, language adviser

Dnipropetrovsk Medical Academy of Health Ministry of Ukraine

Disposal, Treatment and Recycling of Medical Waste

Management of medical waste is truly one of the most acute challenges for Ukraine today. Bio-medical waste (BMW) needs specific handling and treatment because of its highly toxic contents and fear of infection. The main medical waste sources are evident. They comprise hospitals (major sources) and smaller medical institutions such as health centers, health clinics, doctors' surgeries, laboratories, and veterinary practices.

Medical waste can be divided into three main categories. Category A, epidemiologically safe medical waste, includes food waste from all departments of the hospital, except for infectious disease department; waste that did not have contact with biological fluids of patients, infectious and skin-venereal patients. Category B, epidemiologically dangerous medical waste, includes the used medical instruments (sharp things: needles, syringes, scalpels and their blades, etc.); objects contaminated with blood or other biological fluids; organic medical wastes (tissues, organs, parts of the body, placenta, embryos, etc.); food waste from infectious departments. Category C covers toxicologically dangerous medical waste that may represent a chemical hazard.

Various technological processes are used nowadays for treatment and disposal of pathological and potentially infectious wastes. The main physical treatment methods are: sterilization with steam (autoclaves), microwave disinfection, thermal treatment, and sanitary landfill. For treating blood, urine, faeces and sewage chemical disinfection is used as the most efficient option. This method is also applied for the treatment of infectious pathogenic wastes.

The system of medical waste management in Ukraine has a lot of problems, despite the environmental legislation addressing the challenges. In practice everything may happen: used medical syringes, cotton wool, and other wastes are thrown together with household waste into conventional garbage containers. Homeless people and animals can be infected at the garbage dumps. Tuberculosis hospitals disinfect expectorants, but solutions are still drained into the sewage system and may appear in freshwater sources because of the lack or improper work of the sewage treatment facilities. Recycling or reduction of medical waste is not provided.

Thus, the solution of ecological and social problems related to medical waste treatment is possible at the state level by providing proper system of medical waste management which includes: proper medical waste sorting, collection, disposal and recycling; the use of the most efficient treatment technologies for potentially hazardous medical waste. Special attention should be paid to the formation of public ecological consciousness and creating conditions for implementation of rational management in accordance with the legislation of Ukraine.

Viktoriya Kovrova
K.S. Zhabchyk, research supervisor
N. V. Poperechna, language adviser
National TU «Dnipro Polytechnic», Dnipro, Ukraine

Gabions and Phytogabions: Geotechnical and Environmental Design

In the wide range of diverse geo-environmental challenges, the issues associated with geological disasters like landslides, gain the high-priority importance due to difficult predictability and wide-scale devastating consequences.

Landslide challenges especially in urban areas remain largely unpredictable because of complex synergetic interference of geotechnical and climatic factors.

There are lots of engineering designs and techniques currently used for coping with landslide problems like retaining walls, gabions, geotextiles, controlled saturation wells, caged ripraps, phyto reclamation etc.

Conventional gabion is defined as some container, basket, cylinder or box filled with rock, concrete or other construction materials to be used in civil engineering, road building, urban landscaping, military applications etc. A gabion wall is a retaining construction arranged in stacks of stone-filled gabions wired together. Gabion walls are usually attached to the slope rather than arranged vertically. The use of gabion containers is more efficient technique than loose stone usage because they are modular and may be stacked in structures of various shapes; they are also resistant to washing out with water. Gabions also have advantages over more rigid structures, because they can withstand subsidence, distinguish energy of flowing water, and drain freely. In some cases their strength and effectiveness may increase with time, as silt and vegetation fill the voids and consolidate the structure. They are sometimes used to prevent falling stones endangering traffic on the road.

The life expectancy of gabions depends on the lifespan of the wire used to stack them, not on the filling materials of the basket.

Phytogabions are modified gabions with vegetation inside. They have several important features.

- Phytogabion should contain the gravels with smaller size in the midsection and bigger size outside to facilitate proliferation of roots and successful growth of plants.

- The seedlings or seeds of viable and highly resistant plant species are put together with the soil mix inside perforated geotextile bags. Further these bags are tightly placed in the midsection of the phytogabion.

Deep penetration of plant roots into the soil substrate creates a kind of monolith that effectively consolidate the slope with further aesthetic reclamation of the landscape via appropriate geo-environmental technology.

So, phytogabions as a combination of geotechnical structures with vegetation could be smart solution and innovative anti-landslide technique for slope stabilization and revitalization of urban landscapes.

Anastasia Moskalenko
L.O. Tokar, language adviser
M.O. Zhuravliov, research supervisor
National TU «Dnipro Polytechnic», Dnipro, Ukraine

Modern methods of industrial waste utilization in terms of Japanese waste-processing plant

Nowadays, there is about 1 t of garbage per each inhabitant of our planet annually; that is not taking into consideration the worn and broken cars.

Thus, the problem of waste processing is quite a topical one on all the developed countries. To know how to process waste properly along with the development of new branch of industry is the most expedient variant to solve the problem.

Waste-burning plant in the municipal district of Kusiro, Japan, is the example of such a facility. Waste is processed here by means of a combined method involving a gasification furnace, waste incinerator, and fusing furnace.

Gas-purification technologies make it possible to eliminate maximally dioxins and other poisonous substances. Heat generated from waste burning is used; high-temperature vapour is generated as well. Vapour turbine is driven with the generation of electric power.

Waste-processing system is as follows: domestic household waste from four settlements of the municipal district is brought by rubbish trucks. Waste is unloaded from rubbish trucks into storage bins. Large combustible waste is processed preliminarily by crushing being supplied then into a storage bin.

Waste is gasified and burnt; further, ash is fused. The generated combustible gas is sent into the upper part of a furnace for burning and fusing. Noncombustible particulate materials contained in the waste, including metals, are extracted along with the sand from the lower part of a furnace.

With the help of a conveyor, noncombustible particulate materials are sent for separation where there is a dissociation of iron, aluminum and other matters with their following storage at a special-purpose site.

Currently, waste burning is highlighted as a method to generate new type of energy – the energy of the 21st century. In such a way, the plant implements the principle of cyclic circulation of the resources by means of collecting and processing valuable resources being used secondly.

Moreover, fused ash remained from the burning is cooled rapidly in a burning and fusing furnace; next, water granulation slag is produced. Such slag is widely used in the construction industry as a sand-substituting material.

Dasha Reshetilo

M.S. Pashkevych, research supervisor

N.M. Nechai, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Economy and environment

Nowadays people all over the world often talk about two themes economy and ecology. Individuals want to solve different problems in these spheres, but the hardest for them in this challenge is how to do it without damage for any of these areas, because they depend on each other and sometime have the opposite interests. For example, in modern world many people try to take part in environmental protection, but firstly they think about negative influence for the economical side of the problem. The humanity gives priority to economy over the environment, putting the latter in the background.

Consequently, this situation has only one solution which will enable economy and ecology go hand in hand. This solution is represented in the modern concept of *sustainable development*. *The United Nations define it as* “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” [1] In general, it is the concept in which economy, ecology and social sphere play equally important roles. [2] The following ideas can help to achieve the main goal of the sustainable development.

The first one is using modern technologies. Recently in various fields of science and industry more and more new inventions have been implemented. Many of them are really useful, for example, they can reduce the use of electricity and the amount of emissions into the atmosphere.

The second suggestion is closely related with the previous one. The modern technologies are actively elaborated, but the biggest part of them will not go further than the development. Therefore, the realization of the green technologies needs the support by the government for putting it into using. The best example of this is paying subsidies to manufacturers who use new technologies.

The third one is the idea known for many people: recycling garbage. This area is well developed in many countries, but unfortunately not in Ukraine. The reason is the lack of the government interest in this sphere. I think that the attraction of foreign investments can solve this problem, but these actions should be controlled by the government. This, as for me, would give an opportunity for the development of this sphere in our country and attract attention of the domestic entrepreneurs.

So, in the modern technological world the waste should be recycled and used as a raw material for further industrial processes. The approach like this will be beneficial for both economic and environmental issues.

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Tatiana Soroka

I.I. Klimkina, research supervisor

I.I. Zuyenok, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Study of the Stability of Dominant Species of Vegetation in the Conditions of Coal Mine Dumps

Self-growth of dumps after technical reclamation is considered to be an important part of the natural environment restoration, where various plant species can provide a high reclamation potential. The purpose of this work is to study the stability of the prevailing forms of wild plants *Bromopsis inermis* and *Lathyrus tuberosus* which often grow on the reclaimed coal dumps in the conditions of Western Donbass and the impact of increased concentrations of heavy metals and other toxic elements on them, with the overall aim to study the prospects of using these plants for phytomining techniques.

The investigations under this project were conducted at the sites of reclamation of the Pavlograd experimental station for the restoration of disturbed lands in Western Donbass. The basis of the plots was formed by a thick layer of empty rock (8-10 m), on the top of which soil substrates of various thickness were placed. In our explorations we studied areas of reclamation with chernozem, covering the rock, of various thicknesses: 30 cm (variant 1), 50 cm (variant 2) and 70 cm (variant 3).

For the chemical analysis, soil samples were taken from the depth of 0-20 cm as well as from two prevailing plant species: cereal – *Bromopsis inermis* (grows on all areas) and legumes – *Lathyrus tuberosus* (found only in the third area with the thickest layer of chernozem). The plant and soil samples were treated and prepared in accordance with the standard methods for ICP-MS analysis.

It is established that the ratio of the transfer factor in the tissues of *Bromopsis inermis* over *Lathyrus tuberosus* exceeds by 2-3 times for 26 metals out of 37. The sequence of some excesses is presented in the following descending order: Mn > Cd > Cr > Co > U > As > V > Pb (6.13-1.07 times). For arsenic, the ratio is 1.96 times. Moreover, if compare *Lathyrus tuberosus* with *Bromopsis inermis*, the latter accumulates in itself: Mn in 6.9 times and Cd – in 7.7 times more than *Lathyrus tuberosus*. As for *Lathyrus tuberosus*, it accumulates Mg, Cu, Zn and Mo up to 2 times more.

The carried out analysis of concentrations of rare elements showed the ability of *Bromopsis inermis* to accumulate more Ge - by 20 times unlike *Lathyrus tuberosus* which accumulates more Rh (1.04 times).

The conducted analysis showed high reclamation potential of the plant species under the study. The distribution of wild-growing forms is significantly influenced by the qualitative and quantitative composition of the mineral nutrition of the plants. Besides, *Bromopsis inermis* and *Lathyrus tuberosus* have the potential to be used for phytomining technology developments in order to obtain the particular rare elements.

Kateryna Sukha

I.I. Klimkina, research supervisor

S.I. Kostrytska, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

The Water Management Complex of the Dnipropetrovsk Region

Pollution of water is a matter of serious concern for Ukraine. The water management complex of the Dnipropetrovsk region is characterized by significant technogenic pollution due to the operation of the mining and metallurgical industry.

The initial data for the environmental assessment of water quality in large, medium and small rivers are the result of systematic monitoring of surface waters in control areas located on the territory of each region of Ukraine. A large number of enterprises in the region greatly influence the hydrochemical state of the Dnipro river and its reservoirs. In addition to polluting enterprises, water quality of its tributaries is affected by the water quality of the Dnipro River, Samara River and Mokra Sura River. The highly mineralized mine waters of the Zahidny Donbass and the sewage of enterprises of Dnipro also affect the state of the Dnipro River. The high content of iron, manganese, nickel, chromium, cobalt and cadmium is observed at the level of several Maximum Allowable Concentration (MPC) for fisheries. In the river flow of Dnipro not significant changes in the quality of its water but within the Dnipro the content of petroleum products rises to the level of 2 MPC for cultural and domestic water use. The Samara River is highly polluted with suspended substances, iron, oil products at the level of 1.3 - 2.5 cultural and domestic MPC. The content of manganese, nickel, cobalt and cadmium is 3 times higher than the standards MPC for fisheries. In some sections of Samara, there is an increased content of nitrites (up to 2.7 mg / dm³) and ammonium (up to 2.5 mg / dm³).

The analysis show that small rivers in the Dnipropetrovsk region are 10 times more polluted than large rivers. This is due not only to low water content, but also to insufficient protection. The level of water purification is extremely low. Existing treatment facilities, even with biological treatment, remove only 10-40% of inorganic substances and do not remove heavy metals. 370 million cubic meters of contaminated wastewater, or 14% of their volume in the country, are annually unloaded to the Dnipro.

To protect water from pollution, the following measures are proposed: (i) to introduce demineralization technologies for sewage from mines and quarries to reduce the negative impact on the surface waters of the Dnipro Basin; (ii) to limit the discharge of industrial wastewater from sewage into rivers, lakes and other natural water bodies; (iii) to clean stream channels from water bodies from debris; (iv) to update and implement innovative technologies and technologies for waste processing; (v) to put in practice a strong control over the application of fertilizers.

Ksenia Tsunik

O.S. Kovrov, research supervisor

S.I. Kostrytska, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

Investigation of Cadmium Contamination Via Vegetation Tests

Pollution of the environment by heavy metals and their migration through food chains of terrestrial and aquatic ecosystems is an urgent problem. First of all, metals are of interest that are most widely and in considerable volumes used in human production, accumulating in the external environment and representing a serious danger from the point of view of their biological activity and toxic properties. These include: lead, mercury, cadmium, zinc, bismuth, cobalt, copper, tin, antimony, vanadium, manganese, chromium, molybdenum, arsenic etc.

The relevance of the selected topic is that heavy metals possessing high toxicity, are able to accumulate in the human body, to have a harmful effect even in relatively low concentrations. One of such metals is cadmium, which is highly toxic and has a cumulative effect. The sources of cadmium are zinc mines and metallurgical plants, plastic waste, used batteries, industrial and domestic wastewater and fertilizers, as well as cigarette smoke. When the body accumulates higher doses of cadmium compounds, the nervous system is affected. Chronic poisoning leads to anemia symptoms.

At the Department of Ecology and Environmental Technologies, laboratory experiments were carried out, that included study of the influence of cadmium on the growth of plants-bioindicators. For the vegetation tests, Petri dishes were used, in which seeds of wheat and mustard were planted. Seeds were irrigated with a solution of cadmium chloride in increasing concentrations. The volume of a single dose of the solution is 20 ml. A series of dilutions for irrigation have been prepared, which contain different values of cadmium concentrations in relative units of maximum permissible concentration (MPC): 0.1, 0.25, 0.5, 1.0, 2.0, respectively. During the 14 days of the experiment, the growth of plants was observed in comparison with the control dish, in which the seeds were watered with distilled water. It is assumed that after 4 waterings, cumulative concentrations in MPC units will be 0.4, 1.0, 2.0, 4.0, and 8.0 MPC respectively, taking into consideration evaporation of water from Petri dishes and absorption of the solution by plants. An explicit effect of the plant growth inhibition with an increase of cadmium concentration is established. Compared with the control sample, where all the seeds germinated, in 1 and 2 cups with the lowest concentrations, a decrease in the number of germinated seeds by 10% and 25%, respectively, with a decrease to 20-25% of the length of roots and sprouts. In 4 and 5 cups with maximum concentrations of cadmium, seed germination was 25% and 10%, respectively, with significant growth inhibition.

The obtained results allow determine the range of tolerance of various plants to heavy metals and their adaptive properties under conditions of environmental contamination.

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