ФАКУЛЬТЕТ ЛІНГВІСТИКИ

МАТЕРІАЛИ XIV ВСЕУКРАЇНСЬКОЇ СТУДЕНТСЬКОЇ НАУКОВО – ПРАКТИЧНОЇ ІНТЕРНЕТ-КОНФЕРЕНЦІЇ

“INNOVATIONS IN SCIENCE AND TECHNOLOGY”
"ІННОВАЦІЇ В НАУЦІ ТА ТЕХНІЦІ"

Частина 2.

7-30 квітня 2015 р.

Київ – 2015
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The edition is recommended by the organizing committee of the Conference and approved by the Academic Council of the Faculty of Linguistics.

The edition features proceedings delivered at the Thirteenth International R&D Students Internet Conference “Innovations in Science and Technology” held at the National Technical University of Ukraine “Kyiv Polytechnic Institute” on April 7-30, 2015.

The Conference attracted over 290 students and postgraduates.

The publication is intended for scholars, undergraduate and postgraduate students involved in research and development work in different fields of science and technology.

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SECTION 2. NATURAL SCIENCES

ENVIRONMENTAL MANAGEMENT IN ECONOMIC SAFETY COMPANIES

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Environmental management have devoted their labors are many leading scientists. However, the issue of environmental management role in improving the economic security of the industrial enterprise is not yet sufficiently investigated. Therefore, to date, relevant and necessary to have a solution to the question regarding the definition of effective environmental management tools that will increase the level of economic security.

Over the last decade, has developed environmental management, focused on the development of environmentally friendly production processes. Such control ensures the needs of the population in reducing environmental risk, and thus raising the level of health. Environmental safety though and requires substantial investment, but for the appearance of new economic partners, who want to have and constantly getting environmentally friendly products or services.

Environmental management – a part of the management system covers all stages of the economic process. This tactic allows the environmental management work to achieve a balance between the economic interests of the enterprise as an economic entity profitable growth, increasing market, the spread of environmentally friendly goods and services, social and consumer interests of society as a whole (especially in the area of environmental safety).

The effectiveness of current approaches of management in solving economic problems found direct evidence initially in large organizations, corporations and businesses. We are talking about the extension of the principle of self-regulation of environmental activities, which essentially voluntary commitments regarding acceptance now lowering the negative impact of its activities on the environment and the implementation of environmental management. This indicates that the internal environmental policies can help increase revenue and competitiveness.

This behavior requires larger enterprises from small organizations, and firms to remain competitive also in the work based on the principles and approaches of environmental management, and thus pass on the principles of sustainable economic development.

One of the influencing environmental management tools have distinctive economic tool– a financial monitoring institutions, which consist of objects causing the risk of environmental hazards that affect the level of economic security.

The purpose of financial monitoring organizations have to obtain an objective assessment of their financial and economic situation, which allows timely perform safety checks by state supervisory bodies and the time to implement, the necessary preventive surgery.
In order to establish the financial risk of man-made emergencies need to use indicators characterizing aspects of the organization having in its composition permissible sources of accidents:

1. revenues from sales of products, services, realized works;
2. return on sales and capital gains;
3. the degree of debt repayment;
4. indicators of current assets and working capital in the calculations;
5. personal working capital;
6. part of the equity in working capital;
7. non-refundable debt;
8. wear factor.

The main research instrument for the control of technological safety company has a list of activities and facilities that have increased environmental hazard.

When conducting financial monitoring performed calculation of financial indicators and their comparison with the recommended giving the opportunity to assess the risk for accidents and emergencies, from the point of view of the financial condition of the organizations.

Distribution of organizations that have high environmental risk for the financial monitoring is given in Table 1.

<table>
<thead>
<tr>
<th>The Group and the value of financial risk</th>
<th>Highlights groups that affect the security of the enterprise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 – the low degree of financial risk</td>
<td>Financial ratios are within acceptable a limit, which means that the risk of accidents can be, estimated as the smallest, therefore, the degree of economic enterprise highest hazard.</td>
</tr>
<tr>
<td>Group 2 – the average degree of financial risk</td>
<td>Reducing the possibility of financing the planned activities for the different kinds of security. Along with these basic indicators of financial condition of the organization is worse than the first group of indicators.</td>
</tr>
<tr>
<td>Group 3 – a high degree of financial risk</td>
<td>The main classification criterion is the insolvency of the organization with a high degree of risk of accidents and man-made disasters, resulting in the organization goes into limited action.</td>
</tr>
</tbody>
</table>

Table 1. Group companies by reducing the degree of financial risk.

Hence, the importance of management in the management of environmental security is very high, as in fact this part of the common modern management has a large number of management tools potentially dangerous objects in the industry with a high phase of the financial, technical, and environmental and, as a consequence, the economic risk in general.
In almost every case, the water that comes from municipal water systems needs cleaning, which main task is to bring it to the required quality standards. Water, which looks well, can contain a lot of dissolved and undissolved pollutants, so its use is dangerous without proper water treatment. That is why high-quality water treatment is a vital task the successful and correct decision which depends on our own health. One of the innovative water cleaning methods is ultrafiltration.

Ultrafiltration is an effective water purification system which uses a special membrane through which water passes, thereby decontaminating and maintaining normal saline and mineral composition.

One of the main advantages of this type of filters is invariably salt water composition of important elements such as calcium, potassium, sodium and others are saved in water. The water is cleaned of harmful microorganisms, bacteria and impurities, but does not become fresh and tasteless, and retains its natural taste.

Ultrafiltration is a membrane separation process of high and low molecular weight compounds as well as the concentration and fractionation of high-molecular compounds. The process takes place by the pressure difference before and after the membrane.

Ultrafiltration units are used for wastewater treatment and water recycling plants to separate systems in which a molecular weight of the dissolved components is much larger than a molecular weight of the solvent. For example, aqueous solutions containing organic compounds have a molecular weight of 500 or more. During calculation of driving force it can be ignored because osmotic pressure in macromolecular substances is small. Therefore, ultrafiltration is carried out at relatively low pressures.

Hollow fiber membranes of polyethersulfone and other polymer based materials are used in ultrafiltration systems

Ultrafiltration can be used for:
1. water disinfection;
2. treatment of municipal and industrial wastewater;
3. wash water sand, removing iron and refining filters;
4. water clarification before filling in the bottles (drinking and mineral water clarification).

Using standard modules provides ultrafiltration on 99.99% removal of viruses and bacteria, which leads to a high technological and sanitary reliability. In ultrafiltration microorganisms are physically eliminated from the water and it is much more effective than traditional methods of disinfection (chlorination, ozonation, UV disinfection etc.). Due to very small diameter of the pores in the ultrafiltration membrane, bacteria and viruses do not pass. For example, the size of the virus is 0.02 ... 0.4 mcm, the bacteria – 0.4 ... 1.0 mcm, and the pores water clarification before filling in the bottles (drinking and mineral water clarification) 0.01 mcm. Due to this there is no need to chlorinate the water, and disinfection is held immediately before the water is supplied to the consumer.

In today's world there is a tendency to reuse treated wastewater, and after treatment ultrafiltration water is directed to industrial use. This reduces the human impact on water bodies for potable purpose.

Due to ultrafiltration the efficiency of using water can be increased up to 99.8 percent. For this purpose, we use ultrafiltration filter-presses, which provide mechanical dewatering precipitation.

Even if a natural source of water is clear, when filling drinking water in the bottles a fine mesh water filter should be definitely used. Basically, in this case, a mechanical cartridge type filter (e.g. Big Blue 20) or a bag size of 1–5 mcm size.

To sum up it should be admitted that due to mechanical cleaning of water, it is impossible to obtain the required degree of filtration. Water clarification by ultrafiltration is one of the most promising methods of improving water quality today.

References:

NEW TRENDS IN THE DEVELOPMENT OF ELECTROCHEMICAL BIOSENSORS FOR DOPAMINE DETECTION

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The main reason for the increasing interest in the field of electrochemical biosensors is their high specificity and sensitivity, which can be achieved through the combination of biological components and the electrochemical converter. A special role for increasing their sensitivity is played by the development of nanotechnology.
Over the past few years a lot of nanomaterials have already been tested in order to figure out their unique chemical, physical, and mechanical properties, which can be applied in biosensors constructing. Among others, carbon nanotubes have such valuable characteristics as high chemical stability, high surface area and unique electronic properties. All of this give the possibility to increase biosensor sensitivity and response speed. Therefore, carbon nanotubes can be effectively used for constructing of electrochemical sensors [1].

The purpose of this research is to review recent advances and problems in the development of electrochemical sensors for detection the dopamine.

The neurotransmitter dopamine is viable biologically active substance, the lack of which causes the depressed emotional state and leads to a very serious disorder of movement and muscle activity [2].

One of the problems in this area is that the detection sensitivity is largely limited by a slow mass transport of target particles towards the sensing surface. This may cause delayed signal. Such limitations can be removed by promoting 3D diffusion and using electrokinetic means to direct the mass transport of target particles. This was achieved by such electrokinetic means as dielectrophoresis and isotachophoresis [3].

Electrochemical detection has traditionally been based on single working electrodes, which can be applied for individual detection of several target substances. As a result it is more difficult to provide conditions for the simultaneous detection of multiple target species (for example, dopamine and uric acid have similar oxidation potential at most of the usual solid electrodes). This problem can be solved by the application of electrodes composed of different materials [4].

Electrochemical biosensors can obviously be used in a wide range of sciences and for many practical purposes: in medicine, for environmental monitoring, for quality control of foods. This implies the need for careful research on the toxicity of materials used. Such research have been conducted recently in order to examine the safety and potential toxicity of carbon nanotubes. Most experiments have not revealed any obvious harmful effect of properly prepared carbon nanotubes. However, raw carbon nanotubes were found to be toxic to mice after inhalation them. The conclusion is that toxicity depends on the material preparation, especially on surface characteristics [5].

Thus, in spite of an obvious progress in the field of electrochemical biosensors, analytical and kinetic properties of these devices are waiting for their further improvement.

References:
LANDSCAPING WITH BOMBS

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Bomber is associated with bad things but now with useful things. But times have changed and people, too, they began to use old things in new purposes for the benefit of the Earth.

A striking example is attempting to play green areas in different parts of the world, but it will take a lot of time and money which greatly slows down the process. To solve this problem people have come up with an ingenious solution to the problem and began to combine old and new together and the result is a new method for the greening of the planet with bombs with lots of capsules inside.

Choose capsules is the new technology which provide all the necessary seeds for germination. The transparent capsule that provides sunlight, and protection from pests and parasites. The presence of water in the capsule stores from premature drying in dry areas. The soil inside the nutrients and mineral. The body is made of special plastic which after some time will process the microorganisms that are in the middle. But this will happen no earlier than when the plant is not able to develop in the environment in which he was placed for landscaping.

For fast shipping on the place of the arrangement of plants you can use the aircraft. Not necessary to use larger aircraft, depending on the task. But for mass meetings in remote areas of the Earth may need bombers. Automatic system reset bombs, large lifting capacity and an adequate supply of fuel will provide safe delivery at destination. However, it is not necessarily to do with airplanes. In the cities on small patches of land along the streets or even the parks, you can easily contribute to the landscaping.

If there is no possibility to buy these bombs, everyone can make himself at home. The first thing to do is a small amount of clay. Clay, in turn, has lots of nutrients that stimulate the growth of the root system of plants as well as the weight will not give that b seeds blown off by the wind after they were placed on a plot of land. Zero capsules will be the mixture of vermicompost, water and seeds are the most common in your area or even floral semen. You can also use the seeds from the store.

The most favorable conditions for seedlings is spring because it is warm and rainy weather, which in turn is good for growth.

References:
QUANTUM CHEMICAL ANALYSIS OF THE PROPERTIES OF POLYSILOXANE XEROGELS WITH SULFUR-CONTAINING FUNCTIONAL GROUPS

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The object of the research is polysiloxane gels with different surface groups that are synthesized using a sol-gel method, which are widely used in sorption technology, catalysis, etc. [1].

The target is using quantum-chemical calculations to simulate a system that reflects the behavior of gels with surface group, which contain sulfur \( \equiv \text{Si} (\text{CH}_2)_3 \text{-SH} \); to optimize spatial structure, to calculate the total energy of the system, IR, Raman, and NMR spectra of gels; to calculate the adsorption complex gels with the aforementioned cation \( \text{Zn(H2O)}_4^{2+} \).

For quantum-chemical calculations, as a model was chosen a piece of a graft group surface, which contains sulfur \( \equiv \text{Si(CH2)}_3 \text{-SH} \) in Figure 1.

Quantum chemical modeling was performed with approximation using DFT basis b3lyp (6-311g (d, p)).

As a result of this work we analyzed the structure of the functional group gels. It has been written correctly major vibrational frequencies of UV and CD spectra and NMR chemical spectra shifts calculated for this model.

Thus, the aim of this work is quantum-chemical calculations of the surface layer gels such as adsorption centers \( \equiv \text{Si(CH2)}_3 \text{-SH} \). This will allow making accurate classification of absorption bands in the infrared spectra of most real systems that contain such fragments.

Quantum chemical calculations of the total energy of the optimized geometrical structures of \( (\text{HO})_3 \text{Si(CH}_2)_3 \text{SH} \) were performed using density functional theory method (DFT) and the hybrid B3LYP potential with basis set 6-311G (d,p). Besides, we calculated the charge distribution and the electron density on the atoms, their IR, Raman, and NMR spectra. The calculated vibrational frequencies in the IR spectra were used as scaled by a factor of 0.95. NMR chemical shifts spectra were calculated by approximation GIAO. Optimized geometrical structures of the fragments and their IR, Raman, and NMR spectra of nuclei \( ^{13}\text{C} \) are shown in Fig. 1.
The obtained results allowed to perform the correct attribution of absorption bands in the IR spectra of real systems, which contain the above listed fragments (primarily refers to ceramic membranes).

References:

METHODS OF PROTECTION OF AMINO GROUPS

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It is well-known that when planning organic synthesis of a compound, especially with multistage processes, it is necessary to consider possibilities of the course of non-desired chemical reactions. The majority of organic substrates we have to work with always contain a set of functional groups in their structure which can show their chemical reactivity and lead to the formation of a large number of by-products. This phenomenon is quite widespread and also requires additional costs to separate the impurities, reducing at the same time the potential suitability of this reaction for receiving desired substance. For this reason a large number of methods for carrying out organic synthesis including the use of so-called protective groups was developed.

Protective groups block temporarily functional groups which can participate in chemical reaction necessary for other functional group of the given substance. Their use prevents undesirable side reactions, thereby increasing selectivity of the desirable reaction. Nevertheless, protective groups have a number of requirements concerning their use to simplify the procedure of blocking of groups, increase the selectivity of the process, simplify procedure of protection removal etc. Of course all these factors increase the cost of synthesis and its duration, therefore it is almost not used for large-scale productions but finds its application in research laboratories.

Protective groups are commonly used in the synthesis of amino compounds. It isn’t surprising that the use of such compounds is rather widespread in medicine where they are in popular demand, and require advanced methods of production. Despite the high cost and long duration of the synthesis, protective groups are very important in the production of peptides without which the synthesis of such proteins as insulin and a ribonukleaz would be impossible.

Primary amines are oxidized easily, can be used in replacement reactions and, therefore, need blocking. Amino group reactivity is caused by existence of lone pair of electrons on nitrogen atom which is why two types of substitutes can act as protective groups: electron withdrawing (EWG) which pull together electron density from nitrogen atom; space-filling groups (bulk groups) which sterically block electron pair on atom of nitrogen. At present there are many methods of protection of
functional groups of primary and secondary amines (protonation, chelates formation, bond formation between atoms of N and S, N, P, S, Si), tertiary amines (protonation, formation of quaternary salts, formation of N-oxides), hydrazines and hydroxylamines.

The most common protection of amines:
- Carbobenzyloxy (Cbz) group;
- Vinyloxy carbonyl (Voc) group;
- Allyloxy carbonyl (Alloc) group;
- tert-Butyloxycarbonyl (BOC) group;
- Trifluororacetyl (TFA) group;
- Trichloroacetyl group;
- Acetyl (Ac) and Benzoyl (Bz) groups;
- Benzyl (Bn) group;
- Tosyl (Ts) group;
- Other Sulfonamides (Nosyl (Ns) & Nps).

The specified list includes the most available and convenient in use protective groups. However, there is still a number of issues concerned with the selection of appropriate protective group for carrying out the reaction and its introduction into a molecule. Sometimes we may have difficulty in removal of the remains of the fulfilled protective agent from reaction mixture. Thus, the described problem is topical and has the numerous directions for development.

References:

RESEARCH OF DEPENDENCIES IN THE S-ALGORITHM OF ROBUST ANALYSIS

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The main feature of biological research consists in instability of the studied object. In addition to exposure to external factors, there is also “self-action”: properties of an object is changed in the course of his life. For this reason there is a statement that there are no two identical biological objects.

As another consequence of the fact that the object is a living, there are difficulties in the preparation of the experiment (to determine the volume and the number of samples, their selection), and the processing of the results, because the
limitations of the material leads to a limit the number of measurements, which leads us to the concept of “samples of small volume” and appearance of heterogeneity [1].

In such cases, generally use nonparametric methods. However, much of the practical effect when working with data can be obtained through the use of robust procedures, which by their nature are very close to the usual parametric methods and are resistant to emerging inhomogeneities and possible deviations in the studied sample [2].

As already mentioned, robust procedures are similar to the classical methods of data processing. Their undoubted advantage is that the robust estimation is practically not influenced by deviations if the model corresponds to the real is only approximately that suits our case, since the sample of small amounts of data are dangerous because they likely appearance of quazi-outlier.

<table>
<thead>
<tr>
<th>№ sampling</th>
<th>The initial values of the total population</th>
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<tbody>
<tr>
<td>0.00</td>
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<tr>
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</tbody>
</table>

Table 1. Possible combinations for 6 laboratories.

To find out what the impact is still subjected to a robust procedure, a detailed analysis of S-algorithm has been done. For this use the generated on the basis of the example set of samples of six values in each of which quazi-outlier is present. We obtained variants samples (Table 1) were subjected to a robust procedure for the different probabilities. Considered the probability of choosing the same in order to check the behavior of the algorithm than the primary example of the conditions, as in [3] does not specify the reason for the choice of probability as basic. Furthermore, in most studies probability value is chosen equal to 0.1 or 0.05, can be incorrect for small samples.

The work was to find out the following relationship:

1. dependence of the number iterations of the selected probability;
2. dependence of the robust estimation of the selected probability.

When using the S-robust algorithm, special attention should be paid to the proper selection of the probabilities, as it directly affects the procedure accounted for in the factors and, consequently, to obtain a more accurate estimate.
Monte Carlo Method

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One of the most interesting methods of mathematical statistics is the Monte Carlo method. The method is based on the calculate the characteristics of the random variable with the help of its simulation.

The use of random events in the calculations was researched by Georges-Louis Leclerc in 1777. He proposed a method for calculating the number of \( \pi \) with using experience, in which the researcher threw the needle on the plane with parallel strips.

Nowadays, numerical experiments are used in many branches of science. In particular, the Monte Carlo method is used in mathematics, economics, physics, chemistry, etc. But most significantly its application in numerical integration.

Suppose we need to find the value of a random variable. To do this, we take some random variable \( X \), for which the expectation is:

\[
M(x) = a
\]

We need to make enough number of trials \( n \) and calculate the arithmetic mean value of \( x \). The resulting value we can use as an approximate value (\( a^* \)) of the required number \( a \):

\[
a \approx a^x = \bar{x}
\]

\( \bar{x} \) is a selective medium. An exact value of \( M \) can not be calculated, so we need to evaluate the accuracy of the result.

Let us find an upper limit \( d \) of the possible error when reliability \( \varepsilon \)

\[
P(|\bar{x} - a| \leq \varepsilon) = \beta
\]

Suppose we have to find the random variable \( X \) which is normally distributed and its mean square value \( \delta \) is known, then:

\[
\varepsilon = \frac{t \times \delta}{\sqrt{n}}
\]

Where \( t \) – argument value of the Laplace function, where \( F(t) = \frac{\beta}{2} \)

References:
For example, consider the use of the Monte Carlo method to calculate the definite integral.

Note that the definite integral can be interpreted as the area under the curve.

The following algorithm is used for calculation area under the curve:
1. Limit the required area of the figure with easily calculated area. For example choose the rectangle.
2. Choose n points with randomly generated coordinates in this rectangle.
3. Define the number of points (M), which are under the graph of the function.
4. By the formula \( S = S_r \frac{M}{N} \) define the area of the shape under the curve.

This problem can be solved rather quickly and with satisfactory accuracy with the possibilities of the modern computers.

References:

ISOTOPE EFFECT

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Information on the isotope fractionation some biogenic elements began to appear in the first half of the 20th century. However, these studies have revealed fractionation in living organisms as a phenomenon without explanation and understanding of the causes of this fractionation.

Until recently, the mechanisms of isotope fractionation have been significantly described only for carbon isotopes. So in our report we try to describe the mechanisms of isotope fractionation on the example of magnesium.

Natural isotopic composition of magnesium is the following: \(^{24}\text{Mg} = 78,992\%\), \(^{25}\text{Mg} = 10,003\%\) and \(^{26}\text{Mg} = 11,005\%\). The total composition of magnesium in the body is equal to the additive sum of the partial contributions of each isotope. Magnesium is dramatically important for the human body, because without \(\text{Mg}^{2+}\) ion creatine kinase (CK) is not working as far as CK is magnesium-dependent enzyme. \(\text{Mg}^{2+}\) ion is not only involved in the catalytic act, but also affects the substrate phosphorylation, i.e., ATP synthesis. The rate of phosphorylation increases more than twice in the presence of the isotope \(^{25}\text{Mg}\), so-called magnetic isotope.

Organisms can selectively absorb from the environment and accumulate some elements; in particular this refers to light chemical elements. In organisms their concentration with increasing atomic mass of the element is usually reduced. But the presence of certain chemical elements has a significant influence on the processes of intracellular metabolism.

Each chemical element consists of a number of different isotopes as stable and natural radioactive. It is known that isotopes of one element differ by atomic mass.
One can conclude that isotopes expand physical and chemical properties of the element.

Isotopic metabolism is intracellular isotope fractionation at certain stages of biochemical reactions such as decomposition, synthesis and transformation of complex compounds. This process is caused by differences in the fundamental properties of atomic nuclei of isotopes. To be more precise they are mass number and magnetic moment. Thus, researchers can identify and study the diversity of reactivity of molecules, radicals, ion-radicals, as magnetic isotope effect is an indicator mechanism of chemical and biochemical reactions.

It allows to monitor the reaction by controlling the angular momentum of electrons and nuclei in chemical and biochemical reactions using weak magnetic interactions. It has been learned magnetic and non-magnetic nucleus are sorted in the result of this reaction, because the ban on the angular momentum is much higher than the energy ban. This applies to all four corner moments – torque moment, orbital moment, own moment (spin) of an electron and its own nuclear moment (nuclear spin). But there are spinless nucleus (nuclear spin is zero) in nature which is "subordinated" to mass-dependent (kinetic) isotope effect only. Internally molecular isotope ratios introduce a new source of chemical information about the organism.

To conclude it should be admitted that magnetic isotope effect can be applied in biochemical reactions and other fields.

References:

SYNTHESIS AND ENANTIOSEPARATION OF THE CAGE AMINO DERIVATETIVES

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The preparative approach to the synthesis and enantioseparations of cage amines was developed. The D$_3$-trishomocubane amine and diamantyl amine were used as a model compounds.

Earlier there was purposed method of preparation optically active D$_3$-trishomocubane-4-ol (1) and only one stereoisomer ofD3-trishomocubanol is formed$^{(1)}$.

Successful preparation ofD3-trishomocubane-4-carboxyc (2) acid with developed its enantioseparation were described in another article (Figure 1).
We suggest the preparation diamantyl amine with fur there nantioseparations of its amide with mandelic acid by fractional crystallization and the method for the preparation of optically active D3-trishomocubane amines.

We synthesize a racemic of D3-trishomocubane amine. Then we try separate diastereomers by fractional crystallization using d(+)-camphor-10-sulfonic acid. The results this crystallization was unsuccessful, there was obtained mixture of diastereomers in the ratio of 1 : 1(Figure 2).

Figure 1. The optically active D3-trishomocubane derivatives

It was decided to use mandelic and tartaric acids for enantioseparations. The results crystallization of (D3-trishomocubane amine was unsuccessful, there was obtained mixture of diastereomers.

Then we will prepare diamantyl amine with further enantioseparations of its amide with mandelic acid by fractional crystallization.

Finally, we will compare results of enantioseparation with different acids. The absolute configuration will be determined by X-ray crystal structure analysis.

References:
First of all, modern ecological problems of Kalush are caused by salinization of aquifer. The main reason which causes these problems is Dombrovskiy salt-pit. It is situated 3 km to the west from Kalush and has been working since 1967. The extraction of the potassium ore from the salt-pit occurred in two phases: firstly, in 1967, the potassium ore was extracted from the Southern part, and in 1986 an ore extraction started from the Northern part. Not a long time ago, both districts of the salt-pit started to fill with brines, as well as rainfalls which were falling down into it and dissolved remains of the ore. As a result, now we can observe a large salt lake instead of the deposit. This salted water leaks into the soil and causes the salinization of the local aquifers.

So, the purpose of the project is:
– to learn and estimate industrial and ecological situation in Kalush, which connected with producing and processing potassium ore;
– to find and substantiate possible solutions, to prove the benefit of these solutions;
– to analyse the chemical composition of water in the town areas, which are close to salt pollution.

The key question is: How can we prevent the subsidence of the ground surface, the salinization of aquifers after the process of the potassium ore outputting?

To fulfill the given purpose, the following tasks were defined:
– to hold a number of excursions on mining enterprises, which are located near Kalush-Holyn deposit of potassium salts (including Dombrovskiy salt-pit), to visit tailing ponds, storage tanks of salts and industrial sites of chemical fertilizers complex;
– to collect, analyze and generalize the received materials according to the results of visual observations of objects which threaten to the territory of the Kalush region, and also give some suggestions about solving ecological problems in this place.

Expected results:
– protection of aquifers in Kalush from salinization;
– prevention of the tailing dam collapse;
– introduction of recycling scheme of brines with the purpose of getting high quality potassium fertilizers;
reconstruction of the Dombrovskiy salt-pit circle drainage trench. The results of the visual observations and chemical analyses which are made on ecologically dangerous objects have become the basis for getting these results. The scientific work is very important due to difficult ecological situation in Kalush which is connected with not environmentally-friendly technologies of the potassium ore production. That`s why this problem needs an intervention of scientists and local government. The main conclusion is that we have got a possibility to provide the four-stage scheme of brines recycling to get high-quality potassium fertilizers and bring the economic benefit to the region.

References:

CHLORINATION OF METHANE AND THE RADICAL CHAIN MECHANISM
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Alkanes are the substances which are the basis for the obtaining almost all organic compounds. Many methods of the organic substances synthesis begin from the alkanes or their derivative substances. So the investigation of the mechanism of these reactions has a huge significance for the modern science and industry.

One of the ways of obtaining the derivative substance from the alkanes is the halogenation. While this reaction one hydrogen of the alkane replaces by one halogen. And as a result we can get a haloalkane. The simplest example of such kind of transformation is the reaction of the methane chlorination.

This reaction is very widespread in organic chemistry because it is like "initial tool" for the next chemical reactions (Brown et al.2009). The mechanism of the reaction is three steps process through which a reaction takes place. So the reaction has the radical chain mechanism [2].

There are three phases of chlorination alkanes. They are initiation, propagation and termination [2]. The initiation needs putting of energy and after that the reaction is self-supporting (as long as reactants occur without input of more energy).
The next two phases are called propagation steps. During them a chlorine radical join a hydrogen on the methane. As products of the reaction we get hydrochloric acid HCl and the methyl radical. Then the chlorine molecule changes into two radicals. One of them joins the methyl radical.

The first step of propagation occurs by engulfing the heat, that is not energetically profitable. Inversely, the second step occurs by releasing the heat. Of course it occurs very quickly. These two phases are linked together because the methyl radicals are used in the second propagation step. According to Le Chatelier's principle, when concentration of the product of the first step is decreased the equilibrium in the system is removed towards its products [1].

Termination is the last third step in the mechanism of the reaction of methane chlorination. During the termination step all the radicals, that remain in the reaction, join together in all possible ways. This leads to creating more CH₃Cl, more Cl₂ and even two methyl radicals can connect together forming CH₃CH₃.

Consequently, the disadvantage of the chlorination of methane is that not only one chlorination cycle can be realized. And this caused different products of the reaction. They can be CH₃Cl, CH₂Cl₂, CHCl₃ and even CCl₄.

References:
Purpose and mission. To date, to assess the quality of natural waters using microbiological analysis and physico-chemical methods for determination of organoleptic and toxicological indicators. However, such methods of analysis of water bodies do not allow to evaluate sufficiently and predict water quality.

Thus, this article focuses on existing methods of forecasting and application of new techniques that have to be in integrated assessment of natural water bodies quality.

Results of research. Assessment of water objects is based on the determination of hydrological and hydrochemical characteristics, ecological and hydrochemical condition evaluation.

While analyzing the formation of water and hydrochemical regime the main factors that significantly affect the change of a particular reservoir should be identified. These include [2]:

1. changes of river flow;
2. the impact of runoff underground drainage;
3. receipt of drainage water from irrigation and drainage systems;
4. revenues from water contaminated materials from the area of water intake in the form of industrial and domestic waste;
5. sedimentation of suspended particles in water;
6. shaking sediment;
7. transformation of substances due to the physico-chemical and biological transformations;
8. evaporation of water from surface water bodies.

Mathematical modeling of biological processes is one of the components of environmental prediction. In this area, is widely used simulation modeling.

Simulation modeling is type of modeling, which includes a group of methods that allow you to create models and to describe the processes in ecosystems. The ecosystem itself replaced the simulator. With him are experimenting to get information about the system of the same time if is important to gather information about system using nature experiments.

Using according to E.A. Zilov [3] we have identify the most appropriate models for this type with a high predictive efficiency. These include:

1. Complex dynamic model;
2. simple statistical calculation model.

This models are based on differential equations. The difficulty of their solvings is that there is no systematic rules for equations. They are based on semi-empirical regularities arguments and analogies. In addition, when dealing with systems of dozens of differential equations to eliminate errors is very difficult.

Mathematical modeling and experiments with ecosystems models are not the only method to predict anthropogenic impact on water bodies. However in practice this method has been successfully applied and can be an additional and reliable source of information about the reservoirs and allow to predict accurately their condition.
In this paper we propose a simple method for comprehensive evaluation of hydrochemical state of water bodies based on a graphical method of drawing up a model card of surface water quality.

Model-card – a radar chart with scales radius. Each division determines the average value of hydrochemical indicators of water quality. Number of radii equal to the number of hydrochemical parameters (Figure 1) [4].

On the diagram plotted the percentage of the average of the actual value of hydrochemical indices. This indicator for concentration represents the real picture of the direction of change of hydrochemical characteristics that show the sources of pollution.

![Figure 1 - Model card surface water quality](image)

Then using the graph map for the identification of the area with actual pollution to the area we can optimize investigate parameters which is occupied by the optimal values. Then we must find the total ecological factor of water quality in the alignment of the studied reservoir.

For processing the results of mathematical calculations was applied editor MS Excel, and to predict the ecological status of surface waters Program “Predicting changes in the ecological status of natural water bodies” was used.

Thus, the proposed method for predicting the hydrochemical state of natural waters is easy to use and is reliable in practice, its strong points:

1. Friendly for user.
2. Does not require significant capital expenditures.
3. The accuracy of the obtained results.

**References:**

NEUROBIOMANAGEMENT
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Nowadays the unstable economic and military situations lead to nervous breakdowns, depressions and suicides of Ukrainians. As a result people don’t know how to control their emotions and feelings therefore they lose their jobs, friends, and even life. Unfortunately, just few turn to psychologists. The reason for it can be related to quite expensive prices for a visit of a qualified specialist, so not everyone is able to pay the bill for it. As to complimentary services that some psychologists provide, usually they are not good enough, so people try to avoid such specialists. This is basically clear specially if it is related to children, adolescents, those who require rehabilitation for attention deficit, hyperactivity disorder or in case of alcohol, drug and other types of addictions. But we observe a really different attitude to other doctors.

Fortunately, medicine is keeping up with the times and technology of neurobiomanagement allow you to control your brain biopotential. This is due to the modification of the alpha and beta rhythms of electroencephalography and their links with the active participation of the patient. That is, when a person experiences emotions, mood changes, the device captures all this information and shows on your computer or reproduces it with the help of sound. And because of this, patients learn how to control parameters of their brains and internal environment of organisms. By changing brain activity and restoring the neural balance of regulatory systems, people gain experience in changing an unstable emotional state into a state of comfort and relaxation.

According to statistics, 60% of alcohol addicts completely abandoned this bad habit, 75% of drug addicts have made a radical change to their lifestyle (found jobs, increased their range of interests), 100% of people suffering from overeating are now able to control their desires, that leads to weight loss and the disappearance of complexes. Thus we see that the alpha stimulating training is a pathogenetic method of therapy where a circuit of biological feedback is switched to the patient leading to this incredible result.

References:

LOAD RESEARCH ON INCISOR OF LOWER JAW WITH PARODONTOSIS DISEASE USING 3-D SIMULATION
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Previously, parodontosis disease was considered only to the old, but nowadays the disease can occur in young people as well. Parodontosis disease can lead to
complete loss of teeth and the only solution in this way is a complete teeth replacement to implants, which is quite expensive.

This work refers to the detailed research project relevant to the mechanical aspects of the study of biomechanical behavior of the system "tooth - periodontal ligament (PDL) - lower jaw" of a person with parodontosis disease. It provides step-by-step study of simulation models with respect to anatomical reality.

To create a 3-D simulation models the universal program system of finite-element analysis ANSYS was used. The physical properties of mandibular incisor, it’s periodontal at different loads and application of various forces have been studied (Fig.1).

![Fig.1. Biomechanical model of the incisor with compression load and bare neck of the tooth to 1/2 of its length](image)

According to the research, the comparison of the mechanical properties of healthy incisor with bare neck of the tooth to 1/2 of its length shows that compressive strength has decreased in 2 times, and shear strength in 3 times, which indicates that if a patient inadvertently bites some solid food such as an apple, it can break a tooth in 7 of 10 cases.

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**ENVIRONMENTAL MONITORING OF EXHAUST BASED ON AMPEROMETRIC GAS SENSORS**

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The problem of air pollution is of current importance nowadays. Only during 2012 on the territory of Ukraine it was released of about 6821.2 million tons of pollutants into the atmosphere. The main sources of air pollution are mobile sources
such as vehicles, which emissions amounted 2249 thousand tons, of which 76.43% is CO. With the increase of the number of vehicles, this figure is increasing too [1].

Among many pollutants CO is given increased attention because of its considerable risk to health. Carbon monoxide is a colorless, odorless gas that is released with exhaust fumes and during the incomplete oxidation of fuels and industrial chemicals. CO can form stable bonds with hemoglobin and lead to deterioration of cellular respiration. Therefore the problem of timely and accurate determination of the concentration of this dangerous gas is of actual importance, as evidenced by many studies in this area [2].

In the scientific literature, two common types of sensors for detecting CO are mentioned: sensors based on a semiconductor element and amperometric electrochemical sensors. The main problem with using devices of the first type to determine CO in the exhaust gases is their low selectivity and low cross sensitivity at low temperatures.

The development and improvement of amperometric sensors can be done by improving the surface properties and properties of electrode. So a group of scientists from China has developed a novel amperometric sensor based on Pt-microelectrode, improved by nano-gold particles. The catalytic activity of the disk microelectrode was studied in various electrolyte solutions by the cyclic voltammoeter method and the method of constant transition potential. The result shows that gold nanoparticles on a platinum disk microelectrode quite strongly influence on the electrochemical oxidation of CO in 1 N HClO₄. Compared with simple platinum microelectrode, gold nanoparticles significantly reduce strain and increase the current CO oxidation [3].

Another way to obtain new properties and improved amperometric sensors is changing the electrolyte. Amperometric sensor based on Fe-doped electrolyte shows a high sensitivity to CO. The highest sensitivity was observed when La0.8Sr0.2GaO₃ was doped with 15 mol% Fe. Sensors also showed very high selectivity towards CO and independent reactions with other associated gases in the exhaust pipe. The developed sensor in this work is perspective for monitoring CO concentrations in the environment [4].

Also the research is being conducted into the improvement of amperometric sensors at different humidity. These sensors are developed using a silica film on micro sensor electrode. This approach can achieve detection of CO in the range of 9% – 76% humidity [5].

Electrochemical sensors and sensors based on SnO2 showed different results of experiments in real time. Based on these experiments, we can conclude that the electrochemical sensors have better analytical sensitivity at high concentrations because of their work based on the linear dependence of the signal on the concentration of CO and the constant level of noise. However, semiconductor sensors have better sensitivity at low concentrations of CO. Electrochemical sensors are stable for a long time (over 3 years) [6]. So using the amperometric electrochemical sensor type is appropriate for the environmental monitoring of exhaust gases and the amount of CO in them.
MODERN METHODS OF CLEANING THE HOUSEHOLD WASTEWATER FROM BIOGENIC ELEMENTS USING COAGULANT FeCl₃

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The global deterioration of the surface water resources caused by industrial and household and human activities, requires researchers to focus increasingly on upgrading the technological base for treatment of household wastewater.

In Ukraine, centralized water supply systems cover 100% of towns, 89% of small towns and 20% of rural settlements. 94% towns, 50% of small towns and about 3% of rural settlements are provided with centralized sewerage system provided. Approximately 62% of the population has access to centralized sewerage services, mainly in the towns. The highest levels of availability of these services are characterized by Zaporozhye region (81.4%), Dnipropetrovsk region (74.5%), Sumy and Kherson regions (62%), compared with Volyn and Rivne regions that are least equipped with centralized sewerage services (less 27%). According to expert assessments, the following level of centralized sewerage services availability is quite low compared with Western Europe.

In general, equipment and basic water supply and drainage are characterized by poor technical condition and a high degree of wear. The total length of drainage systems within Ukraine is 33830.9 miles, with about 10% of pipelines have reaching the maximum degree of wear. Another 2160 km pipelines are in very poor condition and in need of immediate replacement. Poor technical condition of municipal facilities of Dnipro River Basin is exemplified by the fact that effluents from municipal wastewater treatment plants have been identified as one of the main (direct) sources of pollution.

Household waste water is about 40% of the total inadequately treated or untreated sewage that came to water bodies of Dnipro River Basin.

Currently, the issue of sewage treatment in Ukraine is very serious. It doen’t mean that wastewater treatment is not carried out, this suggests that treatment facilities designed in 60-70th years of the last century can not cope with the current anthropogenic load. Due to the development of industry, transport, energy, and household chemicals, the composition of household sewage also changed. Every day the content of biogenic elements (nitrogen and phosphorus). The content of polyphosphates in the detergent composition may reach 30-50%. Excessive amounts
of biogenic elements in the water causes eutrophication phenomenon ("water bloom").

Increased requirements for the quality of treated wastewater and, consequently, increased the number of stations that can not meet this requirements for various reasons, explain the need for finding ways to improve wastewater treatment process.

After reviewing the theoretical data, it was assumed that wastewater treatment of phosphorus may be carried out by direct deposition of orthophosphates in the form of insoluble precipitate. For this purpose the use of salt coagulant based on ferric chloride (FeCl₃) was suggested. Coagulant in water undergoes hydrolysis to form Fe³⁺ and Cl⁻:

\[ \text{FeCl}_3 \leftrightarrow \text{Fe}^{3+} + 3\text{Cl}^- \]

Next Fe³⁺ ions will react with orthophosphate ions to form insoluble PO₄³⁻ sludge which will be removed from the system. So, assumption is true.

\[ \text{Fe}^{3+} + \text{PO}_4^{3-} \leftrightarrow \text{FePO}_4 \]

It was assumed by me and our research working group that combination of biological and chemical methods allows to increase degree of purification from biogenic elements. For this purpose coagulant FeCl₃ was used. The optimal dose of reagent was measured by the method of experimental coagulation. The results of the experiment confirmed the practicability of using coagulant at the standard public water treatment facilities, as it improves the sewage purification for the following parameters: COD, suspended solids, phosphates and ammonium nitrogen. Moreover, the use of coagulant increases the rate of the sludge dehydration and drying of the sludge bed. Real advantages of the coagulant are low-cost, zero emission, usability and the ability to introduce it at any stage of process without reengineering.

Consequently, this method is not power-consuming; it does not need considerable investments and can be recommended for using at Ukrainian functioning water treatment systems.

### References

STUDY OF BARLEY GENETIC DIVERSITY USING SSR MARKERS

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Barley (*Hordeum vulgare* L.) is an important crop used as animal feed, malt manufacture and human food. Its importance derives from the ability to grow and produce in marginal environments, often characterized by drought, low temperature and salinity. It is only the second after wheat as the most important nutritional grain crop grown in low rainfall environments [1].

Barley is always the main fodder culture in Ukraine and in other countries of CIS and Western Europe. It is due to the balanced amino acid content of its grain, which is common with the standard concentrated feed. In addition, the cost of barley crop production is significantly lower than all other crops. Approximately 3.4 million hectares of spring and 400-500 thousand hectares of winter barley are sown in Ukraine annually [2].

The simple sequence repeats (SSR) markers are widely used in a great number of barley genome studies. SSRs, also called microsatellites, are tandem repeats of 1–5 base pairs, and usually present in eukaryotic genomes. The main characteristic of all SSRs is codominance; therefore they are ideal for breeding, genetic mapping and diversity measurements. Another very important reason of wide use of SSRs is their high variability and for this reason they are considered to be a useful tool in distinguishing closely related plant cultivars. SSR polymorphism can be easily assayed by polymerase chain reaction (PCR) [3].

The objective of the present study was to use the SSR markers for discovering the genetic dissimilarity among 6 Ukrainian and 4 foreign selected barley cultivars.

![Fig.1. The dendrogram for ten barley cultivars constructed from SSR data analysis using unweighed pair-group arithmetic average similarity matrices.](image)

Total genomic nucleic acids were isolated from grains by modified CTAB method and purified. The DNA fragments were amplified by the means of PCR for seven SSR markers and three loci of agricultural traits. The obtained data was evaluated with the software MEGA 6.0 via the unweighed pair-group arithmetic average similarity matrices (UPGMA) approach to build a phylogenetic tree.

The subject of the study was the determination of genetic diversity level and relationships of 10 barley cultivars. Each selected microsatellite locus showed varying degrees of polymorphism.
The dendrogram was built on the results of the SSR analysis as well as the data obtained for three loci of agricultural traits (Fig. 1) [4-6]. This phylogenetic tree has two clusters. The first one contains three subclusters and the latter consists of four Ukrainian (Nutans 106, Odeskyi 14, Slavutych, Stepovyi) and three foreign (Candle – Canada, JB Maltasia – Germany, Jersey – the Netherlands) cultivars. The second cluster has two subclusters with two Ukrainian (Komandor, Palidum 32) and a foreign (Scarlett – Czech Republic) cultivars. Using the data obtained experimentally, we can say that cultivars Odeskyi 14 and Stepovyi are very much alike.

To conclude, we should say that SSR markers are a very useful tool in analysis of barley genetic diversity and determination of their relationships.

References:

COMPLEXING PROPERTIES OF AMINOMODIFIED SILICA
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Properties, application optimization and development of new types of organomineral material is relevant and promising area of chemistry at the present time. Porous materials such as materials based on amorphous silicon oxides are widely used as catalysts and sorbents in industrial processes of material synthesis and recycling materials. Besides silicon oxides are often used as solid phase analytical reagents and stationary phases in chromatography.

One of the common classes of functionalized organosilicas with complexing properties are amino modified silicas (the surface of silicas is covalently bound with aliphatic amines). Properties of the near-surface layer are important in the study of general features of amino modified silicas. Located at the boundary between two phases (gas and solid or liquid and solid) the near-surface the layer is in equilibrium with each of them.

Difficulty of prediction of properties of near-surface layer and general properties of aminoxerogels consist in the fact that the properties of functionalized silica can’t be represented as the sum of the properties of silicon matrix and fixed reagent.
The purpose of this research is to investigate the complexing properties of aminoxerogels by probing ions of Cu (II), and determine the composition of complexes formed.

Synthesis of sorbents gas been carried out using sol-gel based methods. Determination of the number of amino groups that can react has been determined by pH-metric titration. Probing surface materials Cu$^{2+}$ ions has been performed by the method of separate portions using different amounts of Cu$^{2+}$ solutions with different concentration. The determining of the diffuse reflectance spectra has been carried out by using the sample of 0.5 g. The actual density of the researched materials has been determined pycnometrically. The porosity of the material has been established by the ratio of pores volume to the total volume of material.

Three samples of aminoxerogels were synthesized with different molar fraction of the original ethoxysilanes (3 aminopropylethoxysilanes).

Sorption of H$^+$ ions by aminoxerogels are substantially described by the theory of fixed bidentate centers. The number of amino groups at the surface layer is less than the theoretical. This can be explained by the fact that some amino groups isolated within the pores. After the sorption of Cu$^{2+}$ in the surface layer, there are formed complexes with a ratio of Cu: NH$_2$ from 1:1 to 1:4, the latter can be formed only in case when we have a large amounts of the ethoxysilanes in the initial mixture. By increasing the concentration of Cu$^{2+}$ ions, share complex [Cu (NH$_2$R) (H$_2$O)$_5$]$^{2+}$, where R – (CH$_2$)$_3$, in the surface layer increases.

References:

THE DIAMOND NANOWIRES
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The report deals with the diamond and its application in the modern technology. It is known that the diamond has its own blemishes. While the jewelers are sad, the physicists are glad. The Harvard specialists affirm that its imperfection can be successfully used by the creation of the nanowires for the quantum computer. The diamonds have been known for its beauty and its unusual interaction with light for a long time. This interaction gives the inimitable ray play. This quality was firstly used by the laboratory scientists. They applied in practice the method of the receiving single continuous wires.
The key movement of this achievement is that the diamond nanowire can be served as the source of the unit photons given “at the instance”. For instance, Marco Loncar’s group confirmed theoretically this hypothesis in the process of working at the programme of researching the non-linear properties of the photon crystals. The new research combines simultaneously two aims:

– the creation of the nanophoton device which can process the quantum information;
– the creation the high-frequency generator within the bounds of the opto-mechanical system.

The scientists consider that the new way of the radical improvement of the source production of the isolated photons is based on the natural light-emitting stone defect. It is called the nitrogen vacancy (NV) or simply the diamond colour centre. The colour centre “exchanges the information” with the outer source of rays. But the effective photon reception in a stone is hard to do because the colour centre locations are too deep inside of them. The “being snared” atoms interact with the rest of the crystal lattice. As a result, the electronic condition (spin) definitely changes. The big system consisting of such nanodevices can work both independently and together. It could be the greatest step on the way to the calculating quantum nets.

However, the Harvard scientists are not interested in the beauty and the admirable play of the refracted light rays at all. Their aim is to create the devices using the quantum mechanical effects like the quantum computers. The question is that the electron spin can be manipulated in the isolated color centre by the room temperature. In this case, every defect turns into the cubit, which is the smallest element for the storage information in such a computer. It is also important that the diamond nanowires can be received in big quantities. They can be integrated into the different nanodevices without any problems.

Loncar claims that the worked out device, which is based on the diamond nanowires functions as a tiny aerial. This aerial generates a powerful stream of the single photons, which is fixed by the microscope. The stable connection, which belongs to the nano-world of the colour centre with macroobjects (conduits and lenses), is a missing part in the creation of the quantum computer. The monophoton aerial works as a transceiver. It allows recreating this “missing link”. The creation of experimental pattern can be considered as one of the main steps on the way to the achievement of the new, fast and safe technological means of calculation and communication.

To create the experimental model the specialists use the same physical natural processes, which give the tints to the coloured diamonds. For example, a blue diamond signals about the tinge of the boron atoms. The yellow one signals about the tinge of the nitrogen atoms. The operational device model is an array which consists of a few thousands nanowires. Each of them has some micrometers of length and approximately 200 nanometers in diameter.

Only one thing limited the scientists. The NV-defects are distributed irregularly. It makes difficult to use the nanowires as the aerials.
Nevertheless, the Australian researchers from the Sydney Macquarie University worked out a new way of the laser light usage. It helps to “extract” the carbon single atoms from the diamond crystal lattice. Using this new method we can make structures of 2 pikometers (2*10^{-12}) size. This method of laser nano- engraving is a new highly accurate method of making the diamond nanodevices which have the form and the surface of any complicated degree.

In conclusion, it has already been known that these nanotechnologies are to make great changes and modernize essentially the life of the future generations.

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EXTENDED STANDARD MODEL OF ELEMENTARY PARTICLES

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Our report deals with the Standard Model elementary particle physics which was established in the 1970s. This model describes three types of interactions (electromagnetic, weak and strong) of elementary particles. But it omits the existence of both gravitational interaction and dark matter.

There are several laws this model is based on. The first one claims that there are 12 main particles-fermions: 6 leptons (tau lepton, electron neutrino, electron, muon, muon neutrino and tau-neutrino), and 6 quarks (up, down, top, bottom, strange, charm). The second law states the fact that quarks can take park in strong, weak and electromagnetic interactions, charged leptons in weak and electromagnetic, whilst neutrino can take part in the weak only. And the third law is based on the Gauge theory. This is type of field theory, which states that Lagrangian is invariant under a constant group of local transformation.

There is a number of particles for transmitting the different types of interactions as well. At first, this model seemed perfect, and gave incredibly precise results for experiments, but in last decades it seems to be incomplete because of a bit of an error in experiments and some unexplained things too. Gravity was included in this theory with the Higgs boson. That occasion made quite a lot of noise in media, even the End of the World was announced a couple of times for non-really existing reasons. But, such thing as dark matter is still beyond control of the Standard Model.

Therefore, various scientists have put forward a new theory and create alternative extended model. These scientists can be safely attributed to Christopher Peterson. His model contains has a few new particles, including particles of the dark matter. The Higgs boson also has slightly different properties than original theory.
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says. In extended model it can decay to form photons and particles of dark matter. Nevertheless, the traces of this decay is quite hard to be found, but some scientific crews are going to search for them, when Large Hadron Collider will be back with new facilities and extended amount of power for nothing expecting particles.

“It is the dream of every physicist working in the field of elementary particle physics. Collider is now the only place on Earth where my model can be subjected to scrutiny. But the most remarkable is that this business will be engaged in just two independent experiments “– says Christopher Peterson, – “ If the experiments confirm the accuracy of my model, it will radically change our understanding of the structure and function of elementary particles, these tiny building blocks that make up the entire universe. And of course, that such an event would have far-reaching consequences that affect many aspects of our lives in the future”.

References:

CRITICAL COOLING OF MOLECULES

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Absolute zero is the lowest bound of temperature, which a physical body or physical system can have. At absolute zero, any chaotic (thermal) motion of molecules and atoms of matter completely stops. This temperature is equal to -273.15 °C or 0° Kelvin.

Until now, scientists could not cool molecules to such low temperatures, but recently scientists from Yale University managed to reduce the temperature of a molecule to extremely low, that is only in 2.5 thousandths higher of absolute zero. It can be considered as a record in history of science.

For this experiment, strontium monofluoride (SrF) was chosen. Scientists chose this molecule because of simplicity of its structure. It has only one electron, which moves around the circular orbit of the whole molecule.

For cooling, scientists used the method of holding a molecule in magneto-optical trap (MOT). This method is well-known in physics, but earlier it was used only to cool atoms. The base of the method are special lasers, light of which is used for cooling and holding a particle at the same time. However, due to the complicated vibrations and rotations of molecules it is more suitable for the singular atoms.

Nevertheless, the group of scientists created a complicated installation, which is a thought-out construction from computers, electrical components, mirrors, cryogenic coolers and a big amount of wires. It works this way: a beam of atoms SrF was shot from a cryogenic chamber and was slowed by a counter laser beam. After
that, slowed molecules entered the electromagnetic field, where with three perpendicular laser beams they completely stopped. This is the magneto-optical trap for molecules.

Reaching such a low temperature is very important for modern physics. Scientists will be able to do some experiments in quantum chemistry, elementary particles physics etc.

Undoubtedly, this project has prospects in future, for example cooling of molecules that are more complex. However, more complicated and expensive installations are necessary for these needs. This will be the next step, which scientists will do in the near future.

References:

HYDROXYAPATITE IN MEDICINE

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In the modern inorganic material science an important focus is the development of biomaterials based on calcium phosphate. Synthetic hydroxyapatite is a very common material that is used in medicine as a coating of implants that contribute to the development of new bone and to treat the damaged bone tissue due to its chemical and phase similarity to the inorganic component of bone [1].

Exact reproduction of bone tissue is not possible. But this problem is partly solved, by choosing for each case the material, mainly based on hydroxyapatite and its substituted analogues.

Size of hydroxyapatite crystals can vary from a few nanometers to several micrometers depending on the composition, synthesis conditions and further processing, that is often much more compared with minerals of bone [2].

The medium of the human body is characterized by high corrosion activity. Therefore, the following basic requirements such as resistance to corrosive environments and biomechanical compatibility are put forward to materials for implants. High strength and resistance to cracks is needed to ensure reliable operation of the implant in the body [3].

So far there is no reliable data concerning the process that takes place during formation of bone tissue from dissolved in blood the ions of calcium and phosphate. Many studies were conducted [2, 4] and proved that synthetic apatite is formed not immediately: crystallization occurs due to the formation of one or more intermediate calcium phosphates. And based on these data, it was concluded that biological apatite of bone is formed in the same way.
Hydroxyapatite is a difficult material for directed synthesis and research. Apatite is also expensive, but it's important not only in medicine but also in other scientific fields. Many studies of the structure and the receipt of this material have already been conducted, but it is not yet fully understood.

Development and introduction to medical practice of this material will result in a significant improvement of treatment of diseases of bone tissue. [3]

In our subsequent research we will conduct research of obtaining hydroxyapatite, because this process is controversial and it is important to carry out further practice tests to elicit all the disadvantages and problems connected with this material.

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SECTION 3. ELECTRONICS

DENSITY MEASUREMENT OF HEAT FLUXES

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Density measurements of heat fluxes play an important role in estimation of thermomechanical properties of building structures, in thermophysical experiments dedicated to research of substance properties and processes of heat exchange. These measurements are also important for diagnostics of industrial heat powered equipment and for managing of regimes of its operation. Such control helps determinate and rationally use isolating materials and also save heat energy.

The main problem of density measurements of heat fluxes is insufficient level of development of heat flux sensors. This is due to complexity of methods of heat fluxes density measurements. Let us consider existing methods of heat fluxes density measurements.

Heat flux is a quantity of heat ($W$) that is being transmitted via arbitrary surface per unit of time ($t$). Heat flux is measured in watts or kcal/h ($1 \text{ W} = 0,86 \text{ kcal/h}$).

$$Q = \frac{W}{t}$$

Density of heat flux is heat flux to surface area ratio, i.e. quantity of heat transmitted per unit of time via unit of surface area ($F$).

$$q = \frac{W}{Ft} = \frac{Q}{F}$$

Density of heat flux is directly proportional to difference of temperatures on surfaces of a wall ($t' - t''$) and inversely proportional to thermal resistance of thermal conductivity ($\frac{\delta}{\lambda}$).

$$q = \frac{\lambda}{\delta} \frac{t' - t''}{\delta}$$

Heat flux density can be measured using calorimetric, fluid-enthalpy, pneumatic and optical methods. It can also be measured by inertial and pyroelectric heat meters, electromagnetic, dilatometric and thermoelectric devices, based on photoelectric and radiometric effects or using method of auxiliary wall or by measuring the difference of temperatures.

One of the most common objectives is measurements of thermally conductive properties of different building constructions. To solve this problem it is appropriate to use calorimetric and pyroelectric heat meters or method of auxiliary wall. To choose specific method it is needed to consider qualities of measured object. The
method of auxiliary wall is highly demanded. Heat flux density sensors are based on this method. Here is the list of examples of such sensors:

- ИТП-МГ4.03 «ПОТОК»;
- Heat flux sensor ДТП 0924;
- Thermal sensors of Hukseflux (HFP01, SB01, HF03/LI19, RHF);
- Heat flux sensor (see patent US №3785875, МПК H01L 35/18, publ. 15.01.1974) based on anisotropic crystal Zn$_x$Cd$_{1-x}$Sb.
- Heat flux sensor of longitudinal type (see patent US №5314247, МПК G01K 17/00, publ. 24.05.1994).

Heat flux density measurements should be held in relatively low air humidity, less than 85% and ambient temperature ranging from -30 to +50°C.

“Auxiliary wall” is installed on enclosing building construction. Temperature drop, formed on installed plate, is proportional to heat flux density. Temperature drop is converted in electromotive force of thermocouple battery, which is successively connected to generated signal. Battery is located on “auxiliary wall” and directed in parallel to heat flux. As a result, thermocouple battery and “auxiliary wall” make up a transducer. Heat flow density is calculated using results of measurement.

As a result of the analysis, methods and thermal conductivity sensors were proposed according to ГОСТ 25380-82. Perspective issue for the development of this sector is to improve the accuracy and reliability of the sensors reducing the cost of their construction.

References:

APPLYING A STANDARD DEVIATION CALCULATION UNIT OF NUMERICAL TRANSMITTER

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Introduction. At the construction of the nuclear reactor temperature it is required to provide high accuracy and reliability of measurement results. At high ambient instability false values of measurement results can arise due to interference in the communication line in failure to-digital converters and for other reasons. A. Grichaniuk, S. Shantyr (2014) evidence that such failures pose significant difficulties in subsequent transformations, so it becomes an actual problem of detecting failures and edit data in the automatic mode.

The purpose of this paper is the research and development of a standard deviation calculation algorithm of a numerical measuring of transformer monitor reactor temperature.

R. Otnes, L. Enochson (1982) proved that the procedure for determining implausible values in the original data is based on the hypothesis that if the sample value falls within the boundaries defined by the standard deviation of the level of
confidence for the random stationary ergodic process, it is accepted as plausible, otherwise it is improbable.

Fig. 1. Flowchart editing procedure data calculating standard deviation.

Fig. 1 is a schematic diagram which implements the edit process implausible values. The circuit consists of two channels, one of which performs smoothing and generates a sequence $[\bar{x}_i]^2$, and another generates a sequence $\bar{x}_i^2$, and then performs smoothing. Used for smoothing digital filters, each of which performs a bandpass filter and generates an output function to output the smoothed estimate.

The work carried out the development and experimental verification of the simulation on the universal computer, an automatic data editing. It is shown that in some cases the effect of constant extrapolation can be produced. Therefore, the algorithm should impose a restriction on the number of consecutive extrapolations.

Conclusions. Application procedures for editing data on the basis of the algorithm the standard deviation calculation improve the accuracy and reliability of measurement results in high levels of interference.

References:


VOLTAGE TO FREQUENCY CONVERTERS

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In recent years voltage to frequency converters (VFC) have been known for their high accuracy, stability of temperature parameters and fairly simple
implementation. Most commonly, these transducers are used to adjust the analog and digital circuits. The goal is to determine the basic principle of VFC and to distinguish the main recommendation in the design of circuits.

For obtaining high accuracy over a wide range of voltage measurement with relatively simple circuit, the vast majority of VFC are using the double integration principle. The conversion cycle consists of two phases.

Accumulation of integral from a specific input signal during the first phase and reading accumulated integral in the second phase, using another input signal applied to the input of integrator.

There are few different ways of organizing a process of push-pull integration cycle, which divides VFC into three categories:

- VFC with a given duration of compensating impulse;
- VFC with a given amplitude of compensating impulse;
- VFC with a given integral of compensating impulse.

The circuit shown on a Fig. 1 is a basic example to describe the principle of VFC.

The circuit contains a voltage controlled by a generator of current (GC), that provides a linear process of charging the capacitor C until it matches a threshold voltage that is defined by a voltage reference Uref. When the capacitor voltage reaches this value, the comparator changes state and starts generating circuit of the output pulses from one stable state (monostable multivibrator), the result of which is a single pulse of fixed duration. This would give us a single impulse with fixed duration. At the same time controlling impulse, forming at the comparator output, closes the switch S through which the capacitor C discharges. After that the cycle repeats.

For voltage on a capacitor in any given time t (when the switch is open) we have the following expression: 

$$U_c = it / C$$

The time during which the voltage $U_c$ reaches the threshold $U_{ref}$ is equal to:

$$\tau = U_{ref} / i = U_{ref}C / kU_{in}$$

where $k$ is proportionality coefficient between voltage and input current.

Knowing $\tau$, it easy to determine dependence of output frequency and input voltage:

$$f = 1 / \tau = kU_{in} / (U_{ref}C).$$

Integrator is the main element of such VFC, because one input is applied with input signal and other input with compensation impulse. The following equation must be true:

$$Q_{in} = \int_{0}^{T} I_{in}dt = \int_{0}^{T} I_{ref}dt = Q_{ref}.$$ 

As a result, it should be noted that the construction of circuits with VFC must adhere the following guidelines:
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– used in the integration mode op-amp must have a large gain in the open feedback loop and high input impedance;
– upper and lower values of the threshold voltage of the comparator should remain unchanged during the operation of the circuit, by applying the highly stable source of negative supply voltage and op-amp with low input offset voltage and low drift;
– the rate of rising the output voltage of the integrator must be sufficiently high to ensure the rapid discharge of the integration capacitor.

In our future research we intend to concentrate on the reduction of errors by increasing the stability of the reference current source.

References:

RESEARCHING THE PROPERTIES OF CUSTOMIZED MEMS CAPACITOR

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Objective: to determine the dependence of the capacitance of the capacitor plates applied to its voltage.

Relevance of the topic
New microwave components made by MEMS (microelectromechanical) – technology provides reducing weight of device, power consumption and it’s cost with the increasing of functionality, operating frequency and degree of integration. [1]

The principle of work

In the testing capacitor the distance between two plates changes by applying different voltages to the plates. There is the spring attached to one of plates which provides changing the distance between the plates of a capacitor.

It was built and studied the model of MEMS variable capacitance capacitor among simulation in modeling environment “COMSOL Multiphysics”, which appearance is shown in Figure 1. Parameters of the model are shown in Table 1. The results of calculation are presented in graphs in Figure 2

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material of the plates</td>
<td>Steel AISI 4340</td>
</tr>
<tr>
<td>Dielectric</td>
<td>Air (εᵣ=1)</td>
</tr>
</tbody>
</table>

Figure 1: Model of MEMS capacitor
Table 1: Parameters of the model

The physical model underlying the calculation is as follows. The initial distance between the plates $x_0$. When the voltage greater than 0, the distance between plates becomes $x - x_0$.

Excluding the edge effect, capacitance (C) can be defined as

$$C = \frac{\varepsilon_0 \varepsilon_r S}{(x_0 - x)}$$

There is an attraction force when applying a DC voltage between the plates

$$F_e = \frac{1}{2} \frac{\partial C}{\partial x} V_{dc}^2 = \frac{1}{2} C V_{dc}^2 (x_0 - x)$$

The effective spring constant for the electrostatic force can be defined as

$$k_e = \left| \frac{\partial F_e}{\partial x} \right| = \frac{C V_{dc}^2}{(x_0 - x)^2}$$

The spring has a stiffness $k_m$. Under the influence of the voltage spring begins to contract providing the appearance of the another force, elastic force $F_m$, which tends to back spring to its previous state.

Mathematically, this force is expressed

$$F_m = k_m x$$

Forces $F_e$ and $F_m$ are equals in the equilibrium, so

$$k_m x = \frac{1}{2} C V_{dc}^2 = \frac{1}{2} k_e (x_0 - x)$$

Express $k_e$ via $k_m$

$$k_e = \frac{2 k_m x}{(x_0 - x)}$$

Note that these ratios are equal when $x$ reaches value $x_0/3$. The DC voltage at $x = x_0/3$ is called pull-in voltage ($V_{PI}$). If the applied voltage is much higher than the pull-in voltage, and $x$ reaches a value less than $x_0 / 3$, plates of the capacitor can link up, because the spring essentially can not provide full compensation of force. It calls pull-in effect. Therefore, the capacitance can be changed to a maximum of 150% of the original value, without bringing down the capacitor. Theoretically, the maximum controlled changing of capacitance is 50% of the original value. [2] [3]
In this case, operating voltage range where you can change capacitance is \(-0 \div 4\) V. Outside this range appears the pull-in effect.

Range of capacitance increases with increasing the dielectric permittivity (at \(\varepsilon = 1 \div 10\ldots20\) fF (f - femto \(10^{-15}\)) ; at \(\varepsilon = 2 \div 50\ldots100\) fF; at \(\varepsilon = 10 \div 100\ldots200\) fF).

References:


DIGITAL MEASUREMENT OF SIGNAL PROPAGATION DELAY

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Transistors, chips and microprocessors have the ability to delay signals. For monitoring and measuring of these delays the meter is needed that could be applied at technology companies. Time delays are filled with quantized pulses and count the number of output pulses.

The objective of the paper is to choose the measurement method in short time intervals.

The development of such converters has been reflected in the works of E. I. Gytis, E. A. Cherniavskii, V. B. Smolov, V. M. Shlyandin. But they do not have sufficiently accurate time measurement results for small intervals.

One of the indirect methods, based on creation of high-speed and high-precision simultaneous devices is the Nonius method. Nonius method is widely used in time measurement as a means to reduce the error serial converters account and as an independent method for constructing certain measuring devices.

The figure 3.3 shows a functional diagram for measuring time intervals with vernier method to reduce the error \(\Delta t_2\) and synchronization start pulse (\(\Delta t_1 = 0\)).

The circuit operates as follows. The pulses from the generator quantizing sequence are applied to the inputs of coincidence and the input of the frequency divider. Frequency divider generates pulses synchronously with the quantum coherence and runs the test devices. At the same time divider pulses open synchronous circuit output pulses recorded by counter reference.
Pulse nonius generator generates a stop impulse with a period $\tau_i = (n-1)/n$, where $n$ is number of impulses of the synchronous circuit.

After a certain period of time, depending on the length of the period $\tau_0 - \Delta\tau_2$, the photon momentum and vernier sequences will synchronize. Impulse coincidence circuit blocks generator Nonius pulses. Obviously, the number of pulses detected by the counter is proportional to the length of portion $\tau_0 - \Delta\tau_2$.

Measured interval $\tau_i$ can be expressed in the form:

$$T_i = (N-N_f) \tau_0 + N_n \Delta\tau_n, \hspace{1cm} (1.1)$$

where $N$ is a counter reference;

$N_f$ is a counter of accurate readings;

$\Delta\tau_n$ is a step of Nonius equal to $\tau_0 / n$.

This method allows us to reduce the absolute measurement error to the value of $\tau_0 / n$. The value of $n$ can reach sufficiently large values (several tens or even hundreds), which results in widespread method.

Using vernier method for large values of $n$ nodes scheme imposes a number of requirements, the most significant of which are:

- high stability frequency vernier sequence;
- high stability of pulse parameters of both sequences;
- high resolution coincidence circuits.

Conclusion. We can see that Nonius method is best suited for measurements at short time intervals. This method has one drawback, namely the inconvenience of reference measurements on several scoreboards with the subsequent calculations. But we can fix this by choosing modern element base. Selected circuit 74AC11004 is available for Digital measurement of signal propagation delay.
Now the steady increase of a range of ultra-high frequency (UHF) electromagnetic spectrum importance in society is conditioned not only to its successful use in radio and radar, but to the fact that the electromagnetic waves of this range have a number of important physical features and characteristics that distinguish it from the adjacent spectral regions. In particular, the microwave range is characterized by the fact that the microwave energy can be transformed very easily into other forms of energy, such as heat, the energy of the accelerated particles and others. In addition, it is important to note the advantages of microwave electromagnetic waves in a self-organizing selectivity effects, as well as the possibility of concentrating large electromagnetic energy in small volumes and its concentration at the desired location [1]. This formed the basis for the development of new environmentally friendly and energy-saving technologies.

In contrast to known heat transfer fluids, plasma has a number of specific properties that significantly enhance its technological capabilities. You can, for example, to generate non-equilibrium plasma in which the energy of the electrons is much greater than the energy of the ions, and the difference between the temperatures of several thousand degrees. This opens up new ways of conducting chemical reactions [2]. Note particularly the low-temperature plasma such as the presence of electric and magnetic fields and light radiation.

It can be possible the most stable chemical compound to decompose atoms using plasma. Also it is possible to deposit thin films on the surface of materials with special (e.g., semiconductor) properties, to sputter refractory, heat-resistant, wear-resistant and other coatings, to cut metals which are characterized by high thermal conductivity (copper, aluminum) [2]. Thus, it can be implemented various treatment processes depending on the type of plasma gas and the character of the solid surface via the low-temperature plasma. This processes can be grouped into three major groups:

- the desurfacing of material from a solid surface (all kinds of sputtering and etching treatment);
- the deposition of material on the solid surface [3] (chemical gaseous phase, a target material of physical, physicochemical from the target material, to be modified in the gas phase);
- the modification of the surface of a solid (oxidation, anodic oxidation, nitridation, other alloying elements, texturing, annealing and others).

The features of the flow of plasma processes referred above make it necessary to study the conditions of charged particles initiation, the elementary
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processes in the plasma generation, conditions of low-temperature plasma and diagnostics of low temperature plasma flows [2].

Our objective is to consider and study the holey-plate plasma source for ion-plasma surface treatment of semiconductor wafers, plasma processing of production of liquid crystal displays.

Recent studies have demonstrated that a surface-wave plasma source can be used to produce dense and uniform plasma. It has been developed a new surface-wave plasma source using a holey-plate. This source based on a parallel plate structure with a top plate. A major advantage is that much higher plasma densities can be expected because strong electric field can be generated on the surface of holey-plate. Another advantage is that uniform plasma can be created because the intensity and uniformity of the surface waves are dependent on the diameter and distance of the holes in the holey-plate.

In order to scale this source to large area, we have designed a parallel-plate type holey-plate plasma source without using glass as a dielectric coupler. In the paper [4] was presented the holey-plate plasma source and properties of plasma it produces. The design consideration for the plasma shape with 2-8 mm diameter holes are described.

Figure 1. A schematic drawing of the holey-plate plasma source based on evanescent wave

Fig. 1 shows a schematic view of the holey-plate plasma source. This plasma source is composed of a microwave power unit that supplies 2.45 GHz microwaves to two metal plates via a coaxial cable. A 20D coaxial waveguide is connected inside the flange. Therefore, the coaxial waveguide and the plates are in the vacuum chamber. The opposite side of the waveguide is connected to the plates. The two plates parallel to each other with 10 mm space between them. The plates are made from a 2 mm thick aluminum sheet with dimensions of 100 mm x 140 mm. The top plate consist of multiple holes symmetrical placed, called the holey-plate, and the bottom plate is a solid plate. Holes account for 20% of the area of the holey-plate.

The vacuum chamber uses a turbo molecular pump to exhaust the gas at rate of 280l/s. Microwave power as high as 200 W can be coupled to the source using microwave power generator like 2.45 GHz vacuum magnetron via a coaxial cable. The microwave propagate inside the parallel-plate structure, reflecting at top and bottom plates. The evanescent electric field is then produced on the surface of the holey-plate. The effect of the
microwaves on the holey-plate can be explained by the induced dipoles inside a hole. Penetration depth and strength of the evanescent field depend approximately on the diameter of the hole. The plasma is then produced near the holey top plate due to the evanescent field.

In ion-plasma surface treatment plasma contacts with the substrate. Plasma electrons charge substrate negative. So the static electric field is maintained in the plasma stream. As a result it ensures the transfer of ions and acceleration them towards the wafer.

This research has become necessary to develop a plasma source for substrate cleaning, spraying a large area, surface modification of thin film, plasma processing of production of liquid crystal displays.

References:

PHOTOELECTRIC CELLS AND THEIR CLASSIFICATION

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The emission of electrons from solid matter under the influence of light was probably the first photoelectric effect observed by early scientists. It was first reported by Hertz in 1887 when he found that a spark gap illuminated by ultraviolet light would break down more readily than one not so illuminated. Elster and Geitel build the first practical photoelectric cells in 1889. They used the cells in a photometer. Since that time the photoelectric effect has received considerable attention from physicists, but it was not until the advent of talking motion pictures that the photoelectric cell came into widespread use.

The purpose of all photoelectric cells is to convert light energy into electrical energy. Hence, we may classify these devices according to the manner in which they accomplish this result.

_Photoemissive Cells._ This is the most widely used type of photoelectric cell. The sensitive surface (cathode) and the anode are enclosed in a glass or quartz envelope which may be highly evacuated or filled with an inert gas at a very low pressure. It operates on the principle that light falling on the surface of certain solids will cause the emission of electrons. The emitted electrons are then attracted to an anode in the tube and hence cause current to flow through the external circuit. The
magnitude of this current is usually less than a few microamperes. The photoemissive cell is the type to be studied in this chapter.

*Photo voltaic Cell.* This is probably the second most commonly used type of photoelectric cell. It is the light-sensitive element in lightmeters used by photographers to measure light levels in order to calculate exposure times correctly. It operates on the principle that an emf is generated by the action of the incident light on the sensitive surface. The photo voltaic cell is also known as a barrier-layer cell.

*Photoconductive Cell.* This device is one whose resistance changes with variations in the intensity of the incident light. It consists of a very thin film of selenium or certain metallic oxides between two electrodes. For mechanical strength, the electrodes may be coated onto a flat piece of glass as shown in fig. 15-1. Selenium is then vaporized onto the glass in such a fashion that it bridges the gap between the two electrodes. The action of the photoemissive cell in an electrical circuit is that of a variable resistance whose magnitude depends upon the intensity of the light falling on it. This again is not an electronic tube.

**References:**


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**CHARACTERISTICS OF POWER ELECTRONICS DEVICES**

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The aim of our investigation is to analyse some characteristics of power electronics devices. It is worth noting there are several types of them, namely, power Darlington transistors, insulated-gate bipolar transistors (IGBTs), gate turn-off thyristors, and metal-oxide-semiconductor field-effect transistors (MOSFETs).

Power devices are known to be commonly used as switches to convert energy from one form to another. These power devices are currently applied in sources of power supply, motor control systems and a great number of power conversion applications.

To begin with, MOSFET is a semiconductor device in which the current that flows between two electrodes is governed by the voltage applied to the third electrode. A silicon oxide insulation layer is the gate from power source. Through an active channel the carriers of charge (holes or electrons) flow from the source to the drain. By applying voltage to the gate, one can control the width of depletion area. Depletion area will expand if we apply reverse voltage and in this way block the most part of the channel. The current flowing through the channel decreases, so the transistor is closed. Therefore, this value of voltage is called voltage closing. The channel will expand as a result of applying the reverse voltage to the gate,
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which brings about the greater current flow. These transistors are usually used in amplifiers of Hi-End sound frequencies, thus replacing powerful vacuum tubes and bipolar transistors.

Insulated Gate Bipolar Transistor (IGBT) is an electronic power device which is used to control electrical drives. There are both single IGBTs and network management modules for three-phase electric current.

Because of some flaws (low reliability and longtime switching) the early IGBT did not become widely spread. The next generation of IGBTs got rid of these defects. Furthermore, modern IGBT combines the positive qualities of the two main types of transistors: 1) low power control and high input resistance (the quality of insulated gate transistors; 2) low value of residual voltage saturation (the quality of bipolar transistors).

Power devices are traditionally used when currents equal from tens of amperes to 1200 A and voltages from hundreds of volts to 10 kV. At the values of current up to tens of amperes and voltage to 500 V conventional MOSFET transistors should be used instead of IGBTs.

Power electronics devices mentioned above have current-voltage characteristics at different values of voltage or current which flows through these power devices. Transistors have one more important frequency characteristic – switching speed between various states.

As far as casing is concerned, it is made of ceramic, metal or plastic materials. High power transistors require additional cooling. Transistors are mounted on printed circuit boards by “through hole” technology or by surface mount technology. In “through hole” technology, the outputs of transistors are inserted into pre-drilled holes in the board. The bodies of transistors are standardized but not the sequences of outputs, which depend on a manufacturer.

All things considered, one can state that transistors play an important part in power electronics: these tiny devices have plenty of useful properties regardless their size.

References:

ROBOTIC TECHNOLOGIES
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What are the robotic technologies? It is a science which is engaged into the development and creation of robots for simplification of work production and
everyday life of people. Even in the middle of III millennium BC. Egyptians invented the idea of thinking machines: hiding priests inside statues in order to make predictions and advice later in the “Iliad” Homer mentions “mechanical servants” – they are robots.

The word “robotic technologies” was first used in print by Isaac Asimov in science fiction story “The Liar”, published in 1941. Later, towards the middle of the twentieth century, in 1927, one of the most successful writers of the Czech Republic Karel Capek introduces the word in our daily life in his play Rossum’s Universal Robots. Humanlike machines, invented by engineer Rossum didn’t have human feelings and were intended to serve the people. But as the improvement of robots automatic machines turned into thinking machines, they rebelled against the people and destroyed the humanity. Just four years after the Broadway premiere of Chapekovskiy “R.U.R” at the World Expo 1927 in New York engineer D. Wexley demonstrated a simple robot which could execute the commands of man, and deduced 3 laws for robots. Thus, the robot must follow orders of man, not harm him and be able to defend his owner.

Modern robotic technologies emerged in the second half of the twentieth century, when the demand for automation of industrial processes greatly increased. The modern definition of a robot is defined as a universal machine for the implementation of movements that mimic human actions. There are a few directions of the robotic technologies.

Military robots are used to assist military personnel in military operations. These include robots, sappers and rescue, reconnaissance robots-drones and others. Space robots (these are probes, rovers and others) do excellent job with work outside the Earth. Household robots are helping people in everyday life, for example, the robot cleaner.

Industrial robots combine in themselves systems of manipulators controlled by special programs. These robots are designed to perform operations associated with the movement of objects, and are used in research laboratories and industrial production, mostly for painting and as welders. Currently in production processes robots are used in lethal and aggressive environments, when performing heavy primitive operations and in processes with difficult working conditions, where noise, vibration or high temperatures cause occupational diseases of workers and rapid fatigue.

At the moment, there are two important classes of robots: manipulation and mobile robots. The handling robot is a machine consisting of a manipulator device and software management. These robots are very helpful in manufacturing and most widely used in engineering and instrument industries. The mobile robot has a chassis with automatically controlled actuators, hence actually called “mobile”, as it moves in the same way as people. The same types of robots made in Germany were able to remove the problem of radioactive contamination after the accident at the Chernobyl nuclear power unit 4 power plants, so as not to expose people to a large number of emitted radiations on the roof of the fourth power. According to Ye.I. Jurevich during
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the liquidation of the Chernobyl accident about 15 types of modular robots were involved in this process for different purposes. Lightweight robots were robot-scouts used to study the radiation environment on the premises of Sarcophagus, heavy robots were robotic technologies intended for cleaning (decontamination) of the territory.

Not all robots that were brought to be used during the elimination of the accident were able to achieve their objectives and carry out the necessary work. Most robots proved unsuitable for work in Chernobyl. For example, radio-controlled bulldozer amphibian “Komatsu”, which was able to work even on the sea floor, could not resist radiation loads and quickly went out of order. Not suitable for working in such harsh radiation conditions were also two German robots MF-2 MF-3. During the liquidation of the accident combined types of robots were applied. Light robots provide a dynamic visualization of the working platform for the operator of heavy robot, and give an opportunity to monitor the performance of work. But mostly lightweight robots were used for special purposes: conducting explorations, filming videos, making photos and gamma surveys in the premises of the 4th block of the Chernobyl nuclear power plant.

As we can see, robots are now playing a very important role in our daily life. They have already replaced a lot of work that was done by a man much longer than it is done by robots. Perhaps in the future people will spend most of their time on family and personal development, and all of our work will be done for us by the machines with artificial intelligence.

CAPACITY TRANSDUCER’S COMPLEX RESISTANCE PARAMETERS GAUGE
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Actuality. Level’s capacity transducers are widely used in the systems of regulation, operation and control of different manufacturing and technological processes, for example, at oil producing, chemical, pharmaceutical, alimentary and other industry. That kind of transducers are used for humidity measurement, measurement of liquid’s level. For example in mobile, it is used for fuel-measurement systems, for deformation measurement, width of non-conductor materials, linear and angular transference. Capacity transducer’s advantages are simplicity, high sensitivity and low inertia. Sometimes it is necessary to know RC-parameters of full complex resistance of capacity transducer’s replacement scheme for result’s correction measurement. For this reason gauge of parameters of capacity transducer’s complex resistance development is actual.

Often the particularity of applying the transducers is that transducers can locate on some distance from the measurement devices during the process of measurement, which means that it is necessary to be linked up to transducers by means of connecting cables. Cables’ segments contribute their capacities, which are
parasitic and could influence to measurement results. Therefore it is necessary to design the scheme insensitive to these parasitic capacities.

The method of phase sensitivity converting was used. This method allows to divide real and imaginary units of KRP transducer. Synchronous detector (SD) of key mode was implemented. Constant informative component of SD initial signal is distinguishing by reason of its integration (integrant analog-digital converter), whereas variable component (of pulsation) has such period that occurs to the integration interval of ADC integer number of times, and for this reason is drowned almost infinitely. Therefore it is not necessary to use low-pass filter.

Sinusoidal voltage generator must form the signal with low non-linear errors. Such kind of generator is based at 2 integrators using the principle of modeling second order non-linear differential equation Van der Pol type, which solution is sinusoidal oscillations.

**Science novelty.** The analysis of measurement error of RC-parameters complex resistance sensors is showed, including connecting cables capacity, amplitude and phase errors of measuring amplifier from the scheme of converting complex resistance into voltage by reason of cables capacity and errors of other measuring channel’s blocks. The measurement error correction method is suggested.

**Practical usage.** Suggested method allows increasing measurement accuracy. RC-parameters complex resistance gauge could be used at information and measurement systems.

**References:**

**IMPROVED METHOD FOR REMOVING GROSS ERRORS IN MEASURING SHAFT ROTATION SPEED OF INTERNAL COMBUSTION ENGINES**

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Stand tests of internal combustion engines are always performed under some hostile conditions. Some random external environment factors, power outages, system noises, and others belong to the possible list of such reasons. The reasons result in gross errors of measurements, thus they reduce the reliability of the tests, sometimes dramatically. There are a number of ways to improve measurement quality properties, such as it’s accuracy, repeatability and reliability. One of the commonly used approaches to do this is to use specialized algorithms for identification and removing gross errors from results of the measurement.
The main goal of our work is to develop an algorithm of removing gross errors. It’s also very important to do some research of applicability of the algorithm while construction of the shaft rotation speed measuring devices for stand systems for testing internal combustion engines.

The base of our algorithm of removing gross errors when measuring rotation speed is the “Tukey 53X” procedure. The main approach is to obtain estimation of smooth trajectory of change of samples, which is then removed from samples. Unreliable values are identified using certain criteria performed after the smooth component or trend was removed. Interpolation is to be applied for further correction of gross errors. The procedure exploits fact that the median is robust estimation of mean. The median robustness property is used twice while estimation of smooth component. The procedure can be represented as a sequence of steps (Fig. 1).

**Figure 1 – Block diagram of “Tukey 53X” procedure based algorithm**

The algorithm to remove gross errors has been developed and properly simulated using universal computer.

**Conclusion.** Algorithm removing gross errors using the procedure “Tukey 53X” is sufficiently rapid, doesn’t need a lot of memory and can be implemented using RISC architecture microcontroller providing real-time mode.

**References:**

In computer processors, memory cards, TV screens and other electronic devices contain millions of silicon-based transistors. However, these tiny details have certain limitations.

A traditional transistor has already undergone all possible improvements. Now, however, scientists have searched for new materials with special properties. They wanted to make transistors more flexible and transparent.

Scientists from the United States announced the development of the world’s first two-dimensional (2-D) transistor. 2-D transistor is a small electronic device that transmits electric current to create a wiring diagram to power other devices. Scientists hope that the 2D-transistors can be used to create high-resolution displays, which will consume little energy.

Two groups of scientists took part in the creation of 2D-transistor: Argonne National Laboratory in suburban Chicago and the University of California. According to the authors of the project, the thickness of the transistors is only a few atoms, and so thin objects can be considered as two-dimensional. Usually transistors are fabricated using silicon, but this time, as scientists said, they used the materials with more efficient properties. In addition, the new transistors are capable of transmitting higher voltage and do it much faster than the traditional ones. This scientific achievement in the future may prove to be very useful, for example, for high resolution screens [3].

If the layers are very thin, the transistor can be made flexible and not necessarily rigid, as in the case of silicon wafers. In this case, you can think of application such transistors in breeches electronics, TV screens and things like that.

According to scientists, there is not a good method for manufacturing this new type of transistors on a large scale hasn’t been found yet because of the material issues. But they believe that over time it becomes available.

A report on the creation of ultra-thin flexible transistor was recently published in the journal ‘Nano Letters’. Due to the thickness of 10-atomic layers, this transistor is almost transparent in its visible range. The usage of advanced 2D-materials provides the mobility of the charge carrier which is higher than in conventional TFT amorphous silicon transistors [1].

The technology allows producing transistors using almost the same process for different substrates, whether it is a conventional silicon wafer or a polymer such as PET. A monolayer graphene is used for electrodes. Three-four monolayers of hexagonal boron nitride (BN) form a dielectric layer and bi-layer of tungsten selenide WSe2 plays the role of a semiconductor channel.

A monolayer of graphene is produced by chemical vapor deposition (CVD) and is transferred to the substrate, as well as several layers of boron nitride. Optical
lithography and reactive ion etching are used to create the desired pattern on the substrate.

Ready-made transistor exhibits outstanding electrical properties: measured mobility of the chargecarrier is 45 cm², which is about 100 times higher than the parameters of traditional TFT transistors.

Fig. 1. Overall appearance and electrical characteristics of the transistor.

The Fig. 1 illustrates: (a) the PET substrate transistor, (b-e) electrical characteristics, (f) the transmission spectrum in the visible range [2].

Besides outstanding electrical characteristics of the transistor, it exhibits 88% opacity. It retains its electrical characteristics up to 2% in case of mechanical deformation. All this makes it a good candidate for the use in flexible electronics, especially in view of recent advances in the manufacturing of large-area grapheme [2].

In conclusion it should be mentioned that the development of 2-D transistors is a unique scientific achievement and with its further development and improvement it will be very useful for society. In the future (PET) transistors will be used throughout the computer equipment, phones, tablets in the form of flexible displays (flexible electronics).

These displays will be much stronger than (TFT) for the latest 2-D materials to ensure the mobility of charges on multiple orders of magnitude higher.

References:


Nowadays a plenty of sophisticated devices, we can’t live without, have been designed around the world. For instance, computers, smart phones, PDAs, laptops and tablets. We think they make our life more comfortable. Computers are used particularly everywhere. They have become ubiquitous. Computers and integrated systems are critical in science, in such fields as Maths and Physics, when it is necessary to perform large-scale calculations. Computers also help students in their academic purposes. They can carry out data mining for classes and give presentations to their peers. In the area of design and architecture computers and specific software such as CAD are utilized to model, test and simulate new projects before making them real. Computers can store a huge amount of information of different sorts. But with the advent of the computer, peripheral devices with which it interacts as a single mechanism has also been created and improved. One of these devices is a 3D printer, which is being improved day by day and becomes even more functional.

A 3D-printer is a type of peripheral devices that implements layering method to create any physical object in a digitized 3D model. In scientific literature (mainly foreign sources), a device of the type is also named fabberami, and three-dimensional process of printing known as rapid prototyping.

3D-printing may be carried out in different ways and use different materials, but all of them are based on the principle of creating a layered (growing) solid object.

There is a range of technologies used to create the layers:

- Laser stereolithography is an UV laser which step by step, illuminates the liquid photopolymer. When the liquid polymer solidifies it becomes sufficiently strong plastic.
- Melting refers to laser fusing the metal or plastic powder, layer by layer, in the shape of future details.
- With lamination an item is made up from a big number of parts of the work material, which is consistently piled on each other and stuck together, with laser in every section contour of future details.
- Blasting is a process of hardening of the material during cooling. Drops of heated thermoplastic solidify rapidly and adhere to each other, forming layers.
- Polymerization under the influence of UV lamp is a process similar to the previous one, except the fact that plastic solidifies under the action of UV light.
Bonding of powder material is a process when a powder base is glued only with liquid material which is supplied from the inkjet head. Therefore it is made possible to represent the color of a part.

Thick ceramic mixture is also used as a self-curing material for 3D-printing of large architectural models.

3D printing is being firmly embedded in our lives, turning from a narrow focus and expensive services indispensable for professionals in different fields. Availability of 3D printing allows bold experiments in architecture, construction, small-scale production, medicine, education, jewelry, printing, advertising and souvenirs. 3D printing is widely used in the manufacture of architectural models of buildings, entire neighborhoods, cottage settlements with the entire infrastructure: roads, trees, street lighting.

Professional 3D printers are gaining gradually their position in the field of small-scale production. Most often, this printing technology is used for the manufacture of exclusive products, such as art objects, figures of characters for the participants of the online role-playing games, prototypes and conceptual models of future consumer goods or their structural parts. Such models are used for experimental needs as well as for new products presentations.

The use of 3D printers in medicine allows save lives. These printers can recreate an exact copy of a human skeleton for developing techniques to ensure a successful transaction. 3D printers are increasingly used in dentistry and prosthetics, as three-dimensional printing allows you to get dentures and crowns much faster than classical production technology. In 2011 scientists were able to reproduce the living human kidney. For this purpose 3D printer spent only 3 hours.

In our opinion this invention is very important for science and provides new opportunities for development. Every day 3D printers are becoming more common, cheaper and therefore more accessible to people. They will greatly facilitate our lives at home and at work.

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MINI-COMPUTER CUBOX
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The subject of our research is very topical nowadays because in the modern world computers even more often acquire more and more non-standard sizes and overall dimensions. It depends on technical progress which doesn’t stand still and the needs for highly portable sophisticated devices.

People travel a lot and they even more often have a need for a portable computer with a suitable operation system. The majority of existing server platforms are compatible with operating systems of UNIX family. And a computer with the same operating system will be best of all suitable for interaction with them.

The CuBox mini-computer meets all these requirements of the modern world.

Now a plenty of tiny built-in Linux-devices have been designed, but CuBox distinguishes itself at least by the fact that it has more connections per millimeter square, than any other device. Usually they are not listed in full, but we would like to focus now that the HDMI connector with the resolution of 1080 pixels, two high-speed USB ports, an Ethernet port, a MicroSD slot, the eSATA interface, the feed socket and a MicroUSB port are located on the 5,5-cantimeter CuBox rear panel. Add to it the optical audio connector sideways and infrared port in front, and here to you is the most detailed description of 127 cubic millimeters in the latest reviews.

Inside it has ARMv7 with a frequency up to 800 MHz, 1 GB of the DDR RAM (also versions from 2 GB are available). It is shipped with Ubuntu 12.10 operating system and the MicroSD-card of 4 GB, though there is also an official option with Android. As far as CuBox is development platform it has one more important function which allows you to restore the system regardless how far your low level experimental manipulations might have come. It is made possible due to serial USB port and command line emulator on another machine. It is also possible to install another operating system in the same way. You only need to download necessary installer on a flash drive and connect it to a serial terminal before running CuBox.

To start operate CuBox it is necessary only to connect everything and press the button. In case of successful loading, a slightly flickering spark lights up on the forward panel; another, red, on the rear panel, points on the existence of connection to a network. In some seconds you are in a desktop.

On the other hand CuBox is quite demanding concerning types of monitors and display resolutions. By default the resolution is 1920 x 1080, and it is necessary to have a TV with such resolution, but it is senseless with the standard display.

CuBox is rather a universal developer’s tool but can be also used in household conditions, as an audio player, a stuffing of the robot or a local web server. CuBox has all advantages of Linux, but in compact packing.

In conclusion this mini-computer is very topical today and can compete with similar devices. At considerably tiny sizes this computer can be compared with functional specifications of a desktop.

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2. Михаил Шигорин. (2013). Почему мы выбрали CuBox. Available:
Today information leakage via unauthorized interception tools occupies important place in everyday life of our society. The essence of it is that it is staying within the object of information activities (OIA) accept (intercept) signal circulating, and transfer it to the enemy. Unauthorized interception tools are hidden and put at the facility, camouflaged under ordinary objects and other items so that they were difficult to detect.

There are 3 ways of placing unauthorized interception tools on OIA in controlled zone (CZ):
- unauthorized access outsiders to OIA (in CZ);
- foul access regime of staff people to OIA (in CZ);
- laying tools in the building until equipment in it OIA and complex Technical Data Protection (TPD).

By type and method of receiving information embedded devices are divided into:
- Embedded devices for receiving acoustic speech information circulating in the room – audio embedded devices;
- Embedded devices for receiving audio and video media – television embedded devices;
- Embedded devices connected to telephone lines, devices to process and transmit information and so on.

By the way of transferring intercepted information to the enemy embedded devices are divided into:
- Embedded devices that are used to transfer intercepted information airwaves – radio-embedded devices;
- Embedded devices with the intercepted information transmission to networks of communication, control, power, etc.;
- Radio-embedded devices with reradiating (passive);
- Embedded devices with transfer of intercepted information to a standard telephone line – embedded devices such as “long ears” or “artificially pick up” and others.

Radio-embedded devices are embedded devices that transfer intercepted information to TDP funds using the radio. It transfers information by transformation (modulation) intercepted signals into electromagnetic waves that propagate in space – air.
To identify the emitting broadcast radio-embedded devices need to determine the range of their work, the type of modulation and closing. Significant difficulties in finding embedded devices cause types of modulation and closing that are constantly changing and improving.

Embedded devices such as “long ears” tab or “artificially pick up” are embedded devices, combined with consumer telecommunications devices, located on the OIA and can be guided remotely using the same telephone network.

The principle of operation is convenient to consider on the following example:
- dial number to the person into whose telephone embedded device was established to listen;
- after a series of tones tube is placed so that the user did not have time to pick it up as if someone made a mistake and the call system in the telephone with embedded device is disconnected;
- after a certain period of time (10 – 40 sec) it is called again. Thus an outside call, that accidentally got in this time interval, is not connected to the system for 45 – 60 seconds embedded device produces all-clear;
- at the specified time interval (45 – 60 seconds) embedded device is connected to the line, and is monitoring the room acoustics.
- if a subscriber picks up the phone, embedded device switches off.

Radio-embedded devices with reradiating are embedded devices implementing reradiation RF fields with modulation dangerous signal that circulate in OIA.

The structure of the embedded device consists of two resonators, RF electromagnetic resonator (in MHz range) and acoustic resonator tuned to the frequency of the speech signal. These resonators interact so that the acoustic resonator under the influence of the field of speech signal, vibrates, and leads to a change in the quality factor of the RF electromagnetic resonator. The result of reradiating is modulation.

Networked embedded devices are embedded devices that are used for power supply network work. These embedded devices are usually cloaked in appliances (electric lamps, tea maker, etc.) and can be very simply implemented in OIA. One of the essential features of such embedded devices is that they can work indefinitely (as long as there is a network supply).

In conclusion we can state that embedded devices are man-made technical leakage intended to unauthorized interception (hidden receive) information. Therefore, their installation takes steps to camouflage them in different ways. Camouflage embedded devices complicates their search and protection against leaks. Various things in our life have a double meaning and sometimes even the walls have ears and not only. If you work with secrets, you must be careful and know everything about people and equipment you work with.

References:

DETECTION FEATURES OF MANIPULATIVE INFORMATIONAL PSYCHOLOGICAL IMPACT

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In the modern world in constant information confrontation it is necessary to comply with a sober approach to the assessment of the existing state of things. The ancient people said that especially in difficult times everyone should receive information very carefully to avoid negative impacts.

Informational psychological impact is a kind of influence which manifested in various forms such as radiocasting, telecasting, print media, computer Networks or direct contact with the object. It affects the object with special information operations like propaganda or agitation.

The purpose of the psychological impact is to achieve sustainable results in the formation of public opinion in the right direction for manipulators. There are laying sustainable mechanisms of behavior under the influence of which a planned reaction happening.

Nowadays, for the impact on the consciousness actively uses modern media communication. It can be not only printing, radio or TV, it also can be cinema, theatres, ideological posters in public places. Moreover, everyone knows the fact that in this world absolutely nothing is being done for nothing.

There are a number of features that help define informational psychological impact. Features can be divided into organizational (with features of systematic and organization) and informative.

Organizational features particular include:
1. The mass involvement of specialists with knowledge of the state language - subject of impact (journalists, writers, editors, TV and radio presenters etc) by foreign entities.
2. The focus of the company (organization, other state entities) to provide information of their own activities rather than on solving problems e.g. making the plot of production safety and excellent working conditions rather than allocate funds for sewage disposal and treatment facilities.
3. Hiring experts from the field of PR, Information Services editors, known broadcasters (talking heads), etc.
4. The broadcasting and retransmission of foreign television - and radio programs (primarily information).
5. Receipt of financial aid (in exchange for a customized orientation materials).
6. Creation own “agenda” – a list of informational messages that will be covered in the media, the main news agenda of their submission. Visual form of implementation of organizational measures is the preparation and dissemination of
so-called “temniki” (in 2001-2004 the closed directive leadership Ukrainian media, which contained detailed instructions on how the news should cover political events in Ukraine).

7. Information isolation or impose censor on the information which gets to the subject.

8. The organization of press conferences in order to create your own list of informational messages that are worthy media coverage.

9. The information appears in a predefined sections with a negative context, “loser of the year”, “disappointing of the year”, “quarrel of the year” etc.

Informative features include:

1. Confusion, uncertainty, fear and multiversion as the general context information. Any person is psychologically committed to stability, certainty, specific goals and security. Example: Wayfarer stone with three choices roads puts in deadlock even epic heroes.

2. The number of repetitions of keywords that define the essence of the message. These repetitions can join text into the negative cliches: fascism, Nazism, corruption, betrayal, pain, terror, etc.

3. Anonymity, using pseudonyms the authors of information: “According to our informed sources”; “in the corridors of power are rumors”, “source that wishes to remain anonymous”.

4. Using the links in the opinion of authorities, “as proven by scientists,” “do not meet international standards”, “FBI experts”, “while Aristotle (Marx, Pushkin) said,” and so on. Links to authorities used when necessary without rational proof to confirm its position.

5. Using fabricated statements without reasoning (proof): “Ukraine is deprived of outputs in the global information space”.

6. Using the technique of filming from below or from the top. This method creates sympathy or antipathy in the viewer.

The above list is not exhaustive and should be supplemented in the future research in the field of information security.

It should be emphasized that the presence of only one of the signs does not necessarily mean a high probability that we are dealing with manipulative influence of information as part of special operations. Information should be evaluated by a number of features. Objectivity and impartiality estimates based on these criteria can provide a team of professionals or analysts, or use the mathematical theory of probability.

Therefore, to assess the content of text messages widely used content analysis – a formalized method of studying textual and graphic information that is to transfer information in its quantitative and statistical treatment.

References:
CLOUD NETWORKSSAFETY  
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The cloud data storage is a model of online data storage, where data is stored on multiple servers, which are provided for clients used mainly by a hosting company. Unlike storing data in similar own servers, the amount or any internal structure of the server is not visible to the client.

Cloud storage has several advantages, such as: smart spending, easy to use, acquisition, management and support. The user does not need to understand all the work processes, which occur inside the system.

For the last several years there has been a tendency to increase the popularity of cloud storage on the information technology market. Here you can see a graph created by the researching company Forrester, which shows rapid growth of cloud storage.

However, this technology has its main drawback – safety issues.

The problem is that cloud computing servers and local servers use the same operating systems and applications. There is a high threat of remote hacking or malware infection for a cloud. The detection system of intrusion and prevention should be able to define malicious activity at the level of virtual machines, regardless of their location in the cloud.

To avoid this threat, it is enough to install firewall, antivirus, IPS, and other similar programs. It is important that data protection can work effectively in virtualization conditions.

The cloud network area can be blurred or it may disappear. This leads to the fact that the protection of less secure part of the network determines the overall level of security. To distinguish segments with different levels of trust the self-defense must be provided in the cloud virtual machines. The corporate firewall is the main component for the implementation of IT security policy and differentiation of network segments is not able to influence the servers hosted in the cloud.

Also it is worth noting, that the majority of users are connected to the cloud using a web browser. Here we consider attacks such as Cross Site Scripting,
«hijacking» passwords, interceptions of web sessions and many others. The only defense against this type of the attack is the correct authentication and using of an encrypted connection (SSL) with mutual authentication. However, these methods are not very convenient and require additional research and the use of technologies such as tokens and certificates.

The encryption is one of the most effective ways to protect data. ISP provides an access to the data that can encrypt customer information, and permanently delete if it is needed.

In conclusion, the above-mentioned solutions to avoid threats in the security of cloud computing have been successfully used in the projects of building private clouds. Having applied these methods, the number of incidents has been significantly decreased. But these algorithms are not developed enough and they need to be essentially improved.

References:
thickness is inserted inside the cranium to the motor cortex or other brain regions, depending on the objectives sought.

The revolutionary technology has opened to people deprived of their ability to move, joyful perspective. In contrast to existing helmets on the market, allowing the computer to transmit mental commands without surgery, implants accuracy is many times higher, and the possibility of using incomparably wider. Now permission is expected to start clinical trials of a wireless implant. This technology will allow sending neural signals not only computers and robots, and artificial muscles. Then paralyzed people can pick up objects with your own, and not mechanical arms.

Researches in this area are very perspective. These technologies will enable the automation of many processes. People will spend less energy and power, what will increase a productivity. Now we can not image the full list of features that will open to us with this technology. But we know that it will bring a lot of innovations in different areas of our life or maybe change the world. Much seems impossible, but the person’s possibilities are not limited, hard work and perseverance will undoubtedly bring results that can be proud of.

I believe that one day in our homes appear such marvels of technology which will make our life easier, more interesting and fun.

References:

SATELLITES
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There are currently two types of satellites: GEO satellites and low-orbit satellites. GEO satellites are called the ones that are on geostationary orbit.

GEO satellites perform a lot of tasks such as: telecommunication, radio position measurement (systems of navigation GPS and others), the main task of the most GEO satellites is an image generation of perceptible earth surface. Besides, with the help of them it is possible to create quickly large-scale corporate networks and reserve ground-based long-distance trunk channels. At present, multiservice networks are being created on the basis of VSAT technology as well. It is also important to
mention that it is enough only three of GEO satellites to cover the whole surface of the Earth. However, GEO satellites have their own disadvantages and the most significant of them is as follows – it is impossible to locate too many communication satellites on the geostationary orbit as they will prevent each other’s work.

There are also other satellite systems – low-orbit. To the low-orbit systems of satellite communication(SSC) belong such systems for which the height of orbit is at about 700-1500 km, satellite weight – up to 500 kg, orbit grouping – from some units to several tens of satellites-retransmitters (SR). The low-orbit systems provide communication with data terminal equipment located in the polar latitudes and practically do not have any alternative while supplying communication in the regions having underdeveloped infrastructure of communication. Service cost of mobile communication provided by low-orbit systems is many times cheaper than similar services.

In conclusion, up-to date optotelevisual space facilities make it possible to distinguish from the orbit things of about one meter and send a received image with the help of satellites- retransmitters to abonents.

References:

SOCIAL NETWORK AS ENVIRONMENT FOR BUSINESS DEVELOPMENT

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Social networks are one of the most popular modern internet resources and its popularity is absolutely deserved. First of all, they are user-friendly, second of all, they cover user interest amply.

Leading foreign analysts and experts have begun to make money on social networks. The market of advertising in social networks is steadily growing.

Except advertising, social networks continue to spread business by going directly to the stock trades. They offer services to recruiting agencies and coordinate specialized business unions.

But in order to make social network as a business, you need to create all conditions to create value for user, as business in social network is possible only if it aims at its users.

In work we consider the concept of social network values: full information about person, big amount of friends, large number of photos and videos, and a lot of unique content. There are means of creation and regulation for these values.

Besides, there is a possibility of creation user’s own business by mediation in internet-shop trade.

Here are a few examples how can be useful “pocket social network”:
– Building of unified system of communication onside the company (particularly useful with remote workers).
– Creating a unified database, repository of corporate experience and knowledge.
– Control of worker staff and mood and discipline it team.
– Managing work of teams, holding online-conferences, discussions etc.
– Creating a positive and constructive working atmosphere.
– Non-financial motivation of employees.

The fact that interest in social networks will grow in near future is quite obvious: people tend to communicate and there is nothing better for cross-border communication, as personal and business, than social network.

Today social network is a repository of information that so far no one knows how to use effectively. Agencies and companies are learning, gaining experience while social networks are developing tools and models.

Our conclusion sounds this way: social networks are next level of marketing mechanism. After customizing traditional marketing tools (not to mention the quality of customer service), it is necessary to use social networks as part marketing, especially in the age of information.

References:

PHONEBLOKS
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The life of modern man is hard to imagine without a mobile phone. Recently phones have been replaced by smartphones, which are handheld computers that allow the use of mobile devices for different purposes including information processing, access to the Internet, taking photos and video recording and more.

However, mobile devices become obsolete morally quite quickly, they are difficult to update, and manage to fix if not every failure. Recycling devices is also a big problem. What to do? Creators of the concept Phonebloks tried to answer this question, suggesting a design of an apparatus assembled from separate modules.

Since the replacement of a smartphone is expensive, developers offer only changing its elements. Modern gadgets already have a modular structure, the memory chips have standard output terminals, processors have known location of contacts, camera is attached by a standard connector. However, the user
cannot replace these firmly soldered parts. Phone bloks offer to get rid of soldered joints and start using a standardized board of holes.

Phonebloks is a modular concept of a smartphone created by Dave Hakkens, from the Netherlands with the purpose to reduce electronic waste. This is not the first attempt to use a modular design in mobile phones, but the first to receive significant public support and a high modularity. Having added individual components (blocks) to the main board, the user can create a personal smartphone. A separate unit can be easily replaced in case of breakage, obsolescence or change of user preferences. Units will be sold in special stores.

Phonebloks authors argue that a new smartphone and an old one have very little differences, for instance, increased memory, or more powerful processor, etc. Design, screen size and other visible elements will remain the same. A vivid example is iPhone 5S, which does not have a particularly notable updates from version to version.

Depending on their needs, users can choose a specific resolution camera module, a processor with a certain number of cores, a memory chip, a display of the appropriate size etc.

Phonebloks concept provides an opportunity for not only smartphone with flexible configuration, but its subsequent updates. For example, when a more powerful processor appears a user can install it in place of the old one without changing his device. Similarly, you can change the blocks that went out of order without having to purchase a new gadget.

The author of Phonebloks also offers a store of electronic modules similar to the app store for modern mobile devices. Subscribers to this service will be notified about new models of units to choose the supplier, read reviews and comments and resell available details.

Blocks can be created for specific categories of users. For example, blind people will be able to use handy display with support for braille and old people might have keyboard buttons bigger.

Theoretically Phonebloks concept can be adapted to other electronic devices like tablets or digital cameras.

Consequently, the implementation of Phonebloks help satisfy users desires in up to date mobile devices, with characteristics desired. Unfortunately, at the current stage Phonebloks is nothing more than an interesting idea. It is possible that it will transfer into real modular platform.

References:
MICROPHONE AS THE TERMINAL DEVICE

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Microphone is a device that converts sound vibrations in the air to fluctuating electrical signal. This is the basis of the sound-recording tract or sound reinforcement. Microphones are used for radio communication devices such as telephones, radio and television.

First used in practice, the microphone was constructed in 1876 – it was the carbon microphone Thomas Edison. The carbon microphone is used in the analog telephone up to present day. Its effect is based on the changes in the resistance between the carbon granules under the variability of the pressure which exerted on their mass.

The condenser microphone was invented by the engineer Edward Christopher Wente in 1916. The basis of this type of microphones – capacitor, one of the plates which is massive and immobile, and the other is made of elastic material. Condenser microphone is based on the story of electrically charged diaphragm and a fixed plate, which are sound-sensitive capacitor. Thus, the capacitor which is formed by the diaphragm and the metal enclosure changes the capacity. If the constant voltage link up with the plates, the capacitance will change under the influence of the current through the capacitor and produce the electrical signal in the external circuit. Condenser microphones have a fairly uniform amplitude-frequency characteristic and high quality sound reproduction, owing to which widely used in recording studios, radio and television.

The dynamic microphones have the best linear characteristics and good frequency properties so that they have become more used. Dynamic microphone has a relatively simple and therefore economical and reliable design, which includes the Assembly of the diaphragm, voice coil and magnet, which form a miniature electric generator with a sound actuator.

The principle of the microphone

The principle of the electret microphone is based on the ability of some dielectric materials (electret) to keep the surface inhomogeneity of the charge distribution for a long hour. The pressure of the acoustic vibrations, water or solid
matter effects on the diaphragm of the microphone. The vibrations of the diaphragm excite the electrical oscillations and according to the type of the microphone for this process such phenomena are used: electromagnetic induction and changing of the condenser capacity (look at the picture).

All Microphones have the following characteristics:
1. sensitivity;
2. amplitude frequency response;
3. acoustics of the microphone;
4. response curve;
5. internal sound level of the microphone.

It can be concluded that the microphone is a very sophisticated device. It is necessary in any telecommunication (e.g. telephone), in radio, television and so on. To my way of thinking, everyone should have an idea of the device, which he uses every day.

References:

INFORMATION DECISION SUPPORT SYSTEM FOR THE PURCHASE OF SPECIAL EQUIPMENT

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In practice, academic institutions often have a problem with referring goods to one of four scopes of use: military, civilian, military permitted for civilian or dual-use. This problem is primarily caused by large range of products and by the need to involve experts from various fields. In addition, not only the final equipment and weapons are coming on examination, but also their parts and accessories. Customers provide minimal information about the product.

In this regard, there is a need in computer support of experts in carrying out scientific and technical expertise to determine the scopes of use of goods. However, existing decision support systems don’t provide reliable and clear enough using tools to solve this problem [1].

So one of the main task was to create an information DSS to provide expert assistance in determining the scope of use of the product and increase the efficiency of examination.

Such system was developed on the base of principal of DSS. It means that system consists of a set of three subsystems: input, storage (subsystem “Informant”) and analysis (subsystem “Analyzer”)[2].

DBMS Microsoft SQL Server was used as the storage subsystem. The database
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based on the relational model was developed.

Subsystem “Informant” ensures the implementation of basic commands to work with the database taking into account the characteristics of the selected DBMS.

Subsystem “Analyzer” provides information and search analysis (obtained from the user and from the database) and results in different forms (report, decisions, tables or images).

Information and search analysis are based on:

1) searching the information about object of examination in database of realized examinations;
2) receiving additional information from experts and conducting analysis by using system of experts evaluation.

System of experts evaluations means that system of analysis assign 0 or 1 point to each scope of use for each criterion. The final result for each of the four areas is calculated using the total number of points by the formula:

\[ N_B = \sum_{i=1}^{n} N_i k_i, \]

where

- \( N_B \) – the total number of points for one area;
- \( n \) – number of criteria;
- \( N_i \) – points and the first criterion for a sphere;
- \( k_i \) – weight ratio and the second criterion for a sphere.

Weight ratios are calculated by experts using the analytic hierarchy process [3].

Than system chooses the area which has the most points (\( N_B \)) as a result. If several fields have the same (maximum) number of points, the system determines these areas as possible areas of use.

As a result of analysis the expert receives a quantitative assessment of scope of use, assessment of criteria and their marks and auxiliary system solution on the final scope of use of the product.

Finally, an information support decision system was developed. It automates the process of scientific and technical examination on the scope of use of goods. However, there still remains the following problem: errors may occur when the experts calculate and enter the weight ratios. It is necessary to automate the process of calculating the weight coefficients. Finding an effective method to solve this problem can be basis for the future research work.

References:

Методы и модели анализа данных: OLAP и DataMining. Петербург: БХВ. 336
Nowadays information plays a very important part in our lives. Although capacity of storage devices is becoming bigger and bigger, there is a growing demand for creation of methods that allow information to be stored at even much higher densities. The best way to save disk space is to compress stored data by means of archivers.

An archiver is a program for data compression. There are many different types of archivers depending on compression algorithms they use; thus, efficiency of archivers varies greatly. As different data types have their own peculiar and intrinsic features, there is no archiver equally effective for all of them.

New data types are being created continually which is followed by the advent of new compression algorithms and archivers. Nowadays archivers are expected to be multipurpose, efficient and fast. A number of data file formats has been created to store different data types and suit each of them best.

The main file formats include: graphic file formats, video file formats, audio file formats, text file formats, and database file formats.

Different computer applications allow data to be stored in different file types. Software with built-in archivers allows data to be compressed in the process of saving; however, in most cases to achieve more quality results specialized archiving software is used.

Archiving algorithms are divided into algorithms that compress information without loss and those that lose a part of information in compression process. The most obvious example of the latter is jpg compression. Jpg compression algorithm is applied to graphics files and is considered to be the most effective for image compression.

Most modern graphics software is equipped with jpg compression module and allows data to be saved in jpg file format. The format is very flexible and usually has a selection of twelve compression levels. The higher the compression level, the higher data loss will be. It’s spectacular how data loss becomes visible and how image quality depends on it.

The most widely known multipurpose archive file formats are RAR, ZIP, 7Z, TAR, ZIPX, ACE etc. The existence of many archive file formats and requirements imposed on them make developing a better archive file format an exciting challenge for a professional programmer.

References:
To date, storage devices have become an integral part of our lives. The topic that I want to tell you is quite relevant – a solid state drive. Solid State Drive – computer storage device based on memory chips. Besides, SSD provides guidance controller. No moving mechanical parts. Currently, the SSD used in compact devices: laptops, netbooks and smartphones. Some well-known manufacturers switched to production of SSDs already completely sold like Samsung business of producing hard drives of Seagate.

There are two types of SSDs: SSD-based memory, similar to the RAM and SSD based on flash memory. Market share of SSD hasn't yet reached the level of market share hard drives, but SSD sales growth significantly higher than the growth of sales of hard drives.

Drives that built on the use of non-volatile memory (NAND SSD), appeared relatively recently, but due to the much lower cost (from $ 2 per gigabyte) began to steady market penetration. Until recently, much inferior to traditional storage devices – hard drives – the transfer rate, but it is compensated with high speed information retrieval (initial positioning). It is now produced with Flash SSDs read and write transfer rate, far beyond the capacity of hard drives.

SSD characterized by lower weight compared to HDD of the same size and low power consumption.

RAM SSD drives based on the use of volatile memory (the same used in the RAM PC) are characterized by ultrafast read, write and search for information. Their main drawback is the extremely high cost (from 80 to 800 dollars per gigabyte). They are used mainly to speed up large database management systems and powerful graphical workstations. These drives are usually equipped with batteries to store data when power is lost, while more expensive models – backup systems and / or operational copying.

In conclusion I want to say a few disadvantages of the hardware. A limited number of cycles: normal (MLC, Multi-level cell, multi-level memory cell) flash memory allows you to record data about 10 000 times. More expensive types of memory (SLC, Single-level cell, one-level cell memory) – are more than 100 000 times. To combat uneven wear used load balancing schemes. The controller keeps track of how many times that blocks rewritable and if necessary "change their places".

Compatibility Issues with SSD drives obsolete and even many current versions of OS family of Microsoft Windows, which does not take into account the specifics of SSD drives and additionally wear them. The operating system swapping mechanism (swap) on SSD as well, with high probability, reduces the life of the drive;
Price per gigabyte SSD-drives significantly higher price per gigabyte of HDD. In addition, the cost of SSD directly proportional to their capacity, while traditional hard drives cost depends on the number of plates and slowly grows with increasing volume drive.

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CRACKING AND ILLEGAL ACCESS TO WIRELESS NETWORKS
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The main idea of my work is cracking and illegal access to wireless networks. The main reasons, which bring people to crack wireless networks illegally are:

1. Many Internet users wish to get access to worldwide network free of charge therefore they will always be located and connected illegally.

2. Industrial espionage. In our time office Wi-Fi, which is quickly set up by the incompetent administrators, is simply the main entrance in a network of the organization for the grounded person, and therefore it is possible to find a lot of interesting information from mail and ICQ, classified documents in open folders and file garbage cans.

3. The Pentesting – testing for penetration. Pentesters are in fact the same hackers, but acting by the order and in a consent of the owner of a network. Their tasks is checking the safety of a network and resistance to penetration from the outside (or to violation of its operation from within). Considering cost of this sort of services, your neighbor will not employ such expert, and from among the owners of big and medium business will be surprised with safety of IT of structures of the enterprises, as demand for similar services the quite high.

When we consider safety protocols, we usually came across to such notions as WEP, WPA, HMAC, PBKDF2 and many other scary words. At a stage of development of wireless access, in far 1997, the British scientists somehow were not too bothered with safety issues, fondly thinking that 40-bit WEP of encoding with a static key will be quite enough. That is why malicious hackers together with talented mathematicians quickly understood that. Moreover, the networks protected even by long WEP a key in the whole 104 bits shortly began to be equated to the open ones for some reason. However, with the development of computer literacy among the ordinary users, it became nearly more difficult to find a WEP network now than open one, therefore we will pay the main attention to WPA/WPA2.

For successful cracking of WPA/WPA2-PSK we needs to catch high-quality record of procedure of an exchange of keys between the client and access point, as
well as to know the exact name of a network (ESSID) and to attack according to the
dictionary in case if we don’t want to grow old earlier than we will count at least all
combinations of passwords which begin on “a”.

In conclusion we should state that today there is no quite reliable type of
encoding for protection of the Internet access channels. Therefore, there are two
directions of development of the principles of protection: change principles of
authentication or development of new more reliable type of encoding.

INFORMATION WEAPON IN MODERN CONDITIONS
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The third millennium is marked by rapid global development of computer
technologies, electronic telecommunications, and mass introduction in all spheres of
social activity. Rapid development of computerization and information technology of
society will inevitably lead to the creation of a single global information space in
which all means of collection, storage, processing, sharing and storage of information
are accumulated.

Information space actually becomes the theater of war where each opposing
side seeks to gain an advantage, and, if necessary, to defeat the enemy. The scope of
the confrontation in the information area has reached such proportions that caused the
creation of a special concept, dubbed the “information war” or “information
confrontation”.

Information weapon, according to one of the available definitions, is a set of
software and hardware designed to control information resources, the object of
influence and interference in its information systems.

Information weapons can be classified into the methods of influence on
information, information processes and information systems enemy. This influence
can be physical, informational, technical or software and radio electronic.

Since the main part of the information infrastructure are people, whose
motivation is based on their physiological, social and information needs, thus we can
state that usage of so-called information-psychological methods of influence has had
direct impact on security. Scientific and technological progress in information
technology, development of the media to erase national borders in the information
space created an unprecedented opportunity to suppress enemy using unconventional
means of destruction that do not cause physical damage. Passing through the mind of
eyery member of society, long massive information-psychological impact of a
destructive nature poses a real threat to the existence of the nation as a result of
transformation of culture that historically is the basic philosophical and ideological
issue.

The main ways and methods of information weapons usage are:
– damage to the physical elements of the information infrastructure;


– destruction or damage of information, software and technical resources of the enemy to overcome protection systems, introduction of viruses, software and logic bombs laid;
– impact on software and databases of information systems and management systems for their distortion or modification;
– threat or terrorist acts in the media space;
– capture of media channel in order to disseminate desinformation, rumors, demonstration of force and bringing to the notice of their claims;
– destruction and suppression of communication lines, artificial overload switching units;
– influence on operators of information and telecommunications systems using multimedia and software tools to input information into the subconscious or deterioration of health;
– influence on computer equipment, military equipment and weapons in order to destroy them.

On the modern stage of historical development the trend of resolving conflicts without foreign armed violence dominates. Information warfare is no longer a minor factor in addition to the “main” events. It has become one of the most important mechanisms of war, which they consider along with the use of military forces and equipment. Information warfare in the modern world has become a legitimate means of political struggle.

We can conclude that the formation of a single global information space, which is a natural result of the global scientific thought and improvement of computer and information technology, is a prerequisite for the development and use information weapons. Characteristics of effective information weapons and means of protection against it is becoming one of the main conditions of the national security of the XXI century.

References:

RADIO EAVESDROPPING DEVICES

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Nowadays competition in international markets, has been increased by sharply industrial espionage, which uses both legal and illegal methods. Increasingly difficult for the obtaining of protected information used by electronic devices to intercept voice data eavesdropping devices, introduced in offices. For electronic devices to intercept voice data eavesdropping devices are small self-contained automatic means of acoustic intelligence secretly being introduced installed in premises designed for
confidential activities of meetings, discussions, conferences, talks, etc., or adjacent to their premises. Therefore, the detection of electronic eavesdropping devices is one of the important areas of information security companies, institutions and organizations, regardless of their form of ownership. For right choice of equipment in detecting bugging devices need to know how they work, and basic characteristics.

Electronic devices interception of voice information or radio eavesdropping devices (later RED) can be classified by the type of sensors usage, type of execution, the power source type, information transmission method and its encoding method for operating a transmitter installation location, etc. In radio eavesdropping devices to convert the speech signal into an electric can be used the following types of sensors: microphones, transducers acoustic signals propagating in the air, vibration sensors – vibro – acoustic transducers signals propagating on building structures and utilities buildings). Eavesdropping devices with mounted sensors microphone type or directly in the premises intended for confidential activities, or in the channels of ventilation systems related with dedicated facilities. They use microphones with sensitivity to ensure the registration of quiet at a distance of 10-15 meters from the source. Eavesdropping devices with contact-type sensors make it possible to intercept voice data without physical access to dedicated premises intruders. They can be made as a separate unit, usually in the form of a square or camouflaged under everyday objects: ashtray, lighter, watch, pen vase, etc. In a typical performance volume laying device without batteries is between 0.5-1.3 cm3 10-20 cm3. Power of RED made from independent power sources (batteries), AC power or the telephone network. Depending on the radiation power and type of source power RED can work from several hours to several days or even months. When the power supplies from the AC or the telephone line during their work, power of eavesdropping devices is not limited. Intercepted by acoustic tabs information may be recorded by using a portable recording, or transferred to external means of registration of radio and optical links, the AC power, telephone lines, etc. As an external recording devices voice information most widely used digital recorders that are installed in areas of intelligence gathering. In bugging devices used to transmit information energy electromagnetic waves do not affect the human senses and can travel considerable distances, overcoming natural and artificial obstacles. Because of these two properties bugging devices allow using a special receiving equipment to covert surveillance of the object of interest from virtually anywhere remote point. From a technical point of view, bookmarks can work in almost any wavelength range. However, most of the design considerations used frequencies – from 100 to 1000 MHz.

The foregoing features of radio eavesdropping devices, as well as their rather small size and weight eg, acoustic tab HKG-2000 from Helling has dimensions of 59x39 17 mm and weighs 55 grams and supports a range of information equal to 1000 m allow them to be placed in the interior of the premises, building structures, everyday items, radios, electrical outlets and electronic appliances, extension cords,
technical means of communication and their trunks, as well as directly to the power lines.

So, various types of bugging devices give wide scope for action competitors and detractors. The security problem has become particularly acute in our time, while total information of all the processes of human life. Ensure the security of information can be a variety of methods and means of both organizational and engineering nature. Complex of institutional arrangements, policy, technical and other ways means to ensure the security of information forms a system of information protection.

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RASPBERRY PI AS A NEW STAGE IN DEVELOPMENT OF PERSONAL COMPUTERS

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At first Raspberry Pi was designed as a cheap platform for education tasks, but now it is used for whole lot more complicated applications.

Raspberry Pi is a tiny computer (size of board is similar to credit card) with relatively low performance. For example, modern flagship smartphones have more powerful hardware than any version of Raspberry Pi. This is the models list with a little of specs an actual price:

- “A” (CPU ARM1176JZ-F, 256Mb RAM, 26Pin GPIO, 1 USB), $25
- “A+” (CPU ARM1176JZ-F, 256Mb RAM, 40Pin GPIO, 1 USB), $20
- “B” (CPU ARM1176JZ-F, 512Mb RAM, 26Pin GPIO, 2 USB, Ethernet), $35
- “B+” (CPU ARM1176JZ-F, 512Mb RAM, 40Pin GPIO, 4 USB, Ethernet), $35
- “2B” (CPU ARM Cortex-A7, 1Gb RAM, 40Pin GPIO, 4 USB, Ethernet).

Despite the fact that hardware is not modern, there are a lot of advantages of PI, which made it very popular on the market. Due to the price, Pi can be used not only as a computer, designed for easy tasks, but as a “brains” for some robotic toys, and simple gaming consoles. In addition to this, it can be used as more intellectual substitute of multi-functional Arduino controllers or as a basement for building small computer aided systems, for example – CNC mills, 3D printers, computer controlled LED panels, multiple controller that use SCADA, etc.

The biggest advantage of PI in these cases is price. You can by one and use it without fear of breaking, because it costs 35$ or less. Also, PI is very useful because it has GPIO port, that looks like a group of 26 or 40 pins. This unusual port is used for connecting some devises, like Arduino products, some sensors, controllers, LED-s etc. Input and output of pins can be easily programmed or used with a standard drivers of some devises.
Further, the main advantage of Raspberry PI is hardware and software "flexibility". For example, imagine that you are an engineer and you work with PI. If something goes wrong, you can quickly install new firmware to the PI just by inserting other SD memory card (Raspberry Pi has no internal storage). If you need to work with it at home, you can disassemble device that you build and put PI in your pocket. If stock power adapter is broken, you can use a charger from your smartphone. If you need to change OS you can choose it from large list, that include an Android (last versions are not support), Linux, FreeBSD and Windows 10. Most of computers or devises, that are used in similar cases are big, heavy, expensive and cannot be fixed in a few minutes.

Raspberry PI is powerful, tiny and inexpensive tool, that you can use to make, probably, anything. This is the main reason, why computer engineers need to know about it.

WIRELESS SENSOR NETWORK

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Wireless sensor network – a distributed, self-organizing network of a plurality of sensors and actuators, connected to each other by radio. The coverage area of such a network can range from a few meters to several kilometers due to the ability to relay messages from one element to another.

One of the first prototype of a sensor network can be considered a system SOSUS designed to detect and identify submarines. In mid-1990's, the technology of wireless sensor networks have been actively developed in the early 2000s, the development of microelectronics make it possible for these devices is rather cheap element base. Wireless network beginning of the 2010s are mainly based on standard ZigBee.

Many industries and sectors of activity (industry, transport, utilities, security) are interested in the implementation of sensor networks, and the number of users is constantly increasing. Trend is due to the increasing complexity of technological processes, the development of production, the expanding needs of individual segments in the security and control of resources and the use of goods and materials. With the development of microelectronic technology, there are new practical problems and theoretical problems associated with the use of sensor networks in industry, housing complexes, households. Using inexpensive wireless sensor devices control parameters opens up new areas for the application of telemetry and control, such as:

– Timely detection of possible failures of actuators, control parameters such as vibration, temperature, pressure, and so on;
– Control access to remote systems to be monitored in real-time;
– ensuring the protection of museum property;
– accounting software artifacts;
automatic revision of exhibits;
Automation of inspection and maintenance of industrial assets;
Management of commercial assets;
The use of the components in the energy – and resource-saving technologies;
Control environmental parameters of the environment

Despite the long history of sensor networks, the concept of building a sensor network finally took shape and was expressed in certain hardware and software (platform) solutions. Implementation of sensor networks at this stage depends on the specific requirements of the industrial problem. Architecture, hardware and software implementation is at the stage of intensive formation of technology that draws the attention of developers in order to find a technological niche manufacturers future.

Technology

Wireless sensor networks consist of miniature computing devices – *motes*, equipped with sensors (sensors of temperature, pressure, light, vibration, location, and so on. n.) and transceivers operating at a predetermined radio frequency. Flexible architecture, reduced costs for installation isolated wireless networks of intelligent sensors of other wired and wireless communication interfaces, especially when we are talking about a large number of interconnected devices, sensor network allows you to connect up to 65,000 devices. Permanent diminution in value of wireless solutions, increasing their operating parameters allow for the gradual shift from wired solutions in data acquisition telemetry, remote diagnosis, remote sharing of information. "Sensor Network" is now well-established term, indicating a distributed, self-organizing, fault tolerance of individual elements of a network of non-performing and do not require any special installation equipment. Each node of the sensor network may include various sensors for monitoring the environment, a radio transceiver and a microcomputer. This allows the device to measure, independently conduct the initial data processing and communication with the external information system.

Near field communication technology relayed 802.15.4 / ZigBee, known as the “Sensor networks”, is one of the modern trends in the development of self-organizing fault-tolerant distributed systems, monitoring and control of resources and processes. Today, the technology of wireless sensor networks is the only wireless technology, with which you can solve the problem of monitoring and control that are critical to the time of the sensors. Integrated in the wireless sensor network sensors form geographically distributed self-organizing system of collecting, processing and transmitting information. The main area of application is the control and monitoring of the measured parameters of physical environments and objects.


“Classical” sensor network architecture is based on a typical node, that includes a typical example of a node-RC2200AT SPPIO radio path, processor module, battery, various sensors.

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SAFETY OF MESSAGES PASSING IN BANKING INFORMATION SYSTEMS

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The process of cryptographic data enciphering in the banking information security systems can be carried out both in software, and hardware. Hardware representation substantially differs by a greater cost; however it has some peculiar advantages: high productivity, simplicity, and security.

Safety of messages passing in the modern banking information systems is based on the keys, but not on the details of algorithms and, that is why many algorithms of enciphering are open and can be analyzed, while hardware and software settings for their realization are available on the market for buying and selling. In this work the analysis of the most essential descriptions of reports enciphering algorithms in the banking information systems is conducted. Economic efficiency (costs) of application of algorithm, cryptographic firmness, speed of implementation of algorithm on basic software and hardware platforms are considered.

By the information between two branches of one bank the process of keys exchange can be banal enough, though in the banking information system, where the amount of clients achieves tens and hundreds of thousands, the keys management is a serious problem. It happens because the cost of algorithm application, related to the number of possible connections with clients, that is determined after a formula \( (n^2 - n) / 2 \), where \( n \) is the number of clients, among which secret keys in the bank network of telecommunications must be distributed.

In the system of electronic banking with one million clients about \( 5 \times 10^{11} \) connections may occur, thus the cost of the keys distribution appears to be unacceptable high for a bank.

The necessity of providing cryptographic firmness for messages passing in the banking information system intended for mass application, suggests serious requirements to the algorithms of enciphering and to the keys.

The standard algorithm of reports enciphering in the distributed bank information system is intended to provide possibility of its realization in the real-
Innovations in Science and Technology

In modern conditions and political situation in the world the issues of the information protection, public and commercial, as well as financial and private, are considered to be among the most vital ones. Unfortunately, almost everybody knows the fact that all existing information can be read due to different access methods.

To tell the truth, the challenge of ensuring security of information related to the confidentiality, integrity, authentication and non-repudiation is unthinkable to imagine without using cryptography. If cryptography provided only closed government link before 1990, so nowadays the usage of cryptographic techniques is widespread through the development of computer networks and electronic data exchange in various areas: finance, banking, trade, etc.

Moreover, in today’s world, cryptography has a wide variety of applications. Besides it is obvious, that this science is used to transmit information; also, it is used in cellular communication, digital pay TV through connection to Wi-Fi, in different banking operations and even to protect your email from spam.

Let us consider the meaning of cryptographic methods of information protection. Cryptographic methods of information protection is a special encryption, encoding or other transformation of the information, which results in its content, and becomes inaccessible without a key cryptograms and inverse transformation. Cryptographic methods of protection, of course, are the most reliable methods of protection, as the information itself is protected directly but not access to it (e.g., encrypted file cannot be read even in the event of theft media). This protection method is implemented as programs or software packages.

The next point we would like to talk about a little bit more is the algorithm. Conversion method in a cryptographic system corresponds to the usage of a special algorithm. The action of such algorithm is run with the help of key ciphers.
Persistence of any system of close link is determined by the degree of key’s secrecy. However, other users on the network must know this key, so they can freely exchange encrypted messages. Modern cryptography knows two types of cryptographic algorithms: classical algorithms based on the usage of closed, secret keys and the new algorithms with a public key, in which we use one outdoor and one indoor key.

Furthermore, there exist many algorithms for cryptographic protection of information. They include DES, AES, and MD5, etc. These different encryption standards are used in modern systems for information security. Moreover, there exist many cryptographic systems such as A5/1, RSA, el Gamal’s digital signature, etc. For example, digital signature is used to identify the client in banks.

In our opinion, development of new data encryption methods is the most important task for scientists to work on. One of the first examples in the history of cryptography is connected with Caesar because it was his ciphered document. In this document each letter of the Latin language was replaced by another. Since that moment the history of the information security development is considered to start. As we mentioned before, today there exists many different more or less secure methods, but none of them provides absolutely reliable protection.

We think that scientists should apply new more reliable and perfect equipment. Moreover, they need to pay attention to the communications channels improvement, because information leakage occurs due to communication lines. Besides, scientists need to work on improvement of the existing protection.

Our personal information is vulnerable and passwords, which are used to protect it, are easy to crack. Scientists from the University of Bristol suggest using quantum cryptography instead of mathematical encryption.

The technology already exists but only in laboratories. However, physicist Jeremy O’Brien is sure that the development can be used in ordinary smartphones. In order to operate, the technology demands that both the transmitter and the receiver of information have been provided with a source of photons and the whole system is very sensitive to external factors. O’Brien suggests using only a single photon source in the transmitter, the receiver, for example, a mobile phone can only receive, convert and route the signal. This will help avoid problems with noise and make the technology robust enough.

O’Brien and other researchers write that “results have considerably expanded operational capabilities of quantum cryptography outside the laboratory, is the beginning of the path to the expansion of quantum encryption technologies for the general public and handheld mobile devices”. If the technology was really going to be implemented, it would mean that for some time information in a mobile phone would really be fully protected.

In conclusion we can state that information protection nowadays is a key issue and we are sure that cryptography can help solve problems with security. The problem has its future development and probably in the nearest future keys for
ciphers and technology will be improved greatly, thus reading classified information will be impossible.

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COMPARSION ANALYSIS OF 3D-MODELING SOFTWARE FOR REPRESENTATION OF MOLECULAR STRUCTURES

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This work is dedicated to analysis of software that gives an ability to visualize three-dimensional structures.

During the research there is often arise a task, when you need to represent some structure in three dimensions. Unfortunately, not everybody has a good imagination to make it in compliance with the real composition of structure. That is why lots of different software appeared, to ease three dimensional visualization and additional features. But it can be hard to be oriented among such variety of different software. This work appeals to help in it.

In this work, such software and plugins were used: Chime, Metastream, Cult3D, Cn3D, Chimera. In addition, files with hemoglobin molecule were used (own format for each plugin).

Chime plugin is widely used to visualize molecular structures on Internet. Chime, made by MDL works directly in web-browser. Also, the feature is that most of Chime is closed, only some molecules are shown, that author quotes on web-pages. For placing Chime–structures author can use lots of formats (*.mol, *.pdb, *.xyz and other) without an additional processing of them. Reader should just download and install a plugin, which supports the most popular computer platforms (Windows, Macintosh, Irix).

For quick and high quality overview of 3D objects, the most suitable technology on Internet is MetaStream, which is developed by Real Time Group (RTG), the subdivision of MetaCreations, cooperatively with Intel and licensed by Microsoft. The main advantage is that user is allowed to rotate 3D-models in any angles, enlarge/minimize objects and move them within the bounds of overview window. This is achieved with usage of trixels (basic component of any two-dimensional digital image, defined in RGB color model and three coordinates: X, Y, Z). The disadvantage is that prior preparation of image in 3D-modeling software is required. Images are placed in own MetaStream format.

Cult3D technology is also a plugin, which allows to overview internet images in own Cult3D format. As in MetaStream, images should be pre-processed in 3D graphic software, exported to the own-format file and uploaded to Cult3D Designer IDE. For online results publishing Cycore license is required, which can be free or paid.
Cn3D software is also auxiliary application for web-browsers. Cn3D is specified for Windows, Macintosh and can be composed on Unix. It is demonstrating the structure, sequence and alignment at the same time. The latest versions have more powerful abilities for annotating and editing the alignments.

It is convenient in usage, has lots of additional features: both visual (different types of molecule declaration) and practical. It supports .cn3 format. Cn3D allows to transfer and download structures from NCBI database. Detailed manual in English is included.

UCSF Chimera is a software for interactive visualization, molecular structures analysis and data, connected with it, including density maps, supermolecular ensembles, alignments, traces and conformational ensembles. It allows to create a high-quality images and animations. Full documentation and several manuals are included.

Today there is a great variety of different applications for 3D structures review and editing. The most suitable for posting and reviewing it on Internet is Chime plugin, for editing and working with 3D molecules the best is Chimera.

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ADVANTAGES&DISADVANTAGESOFDISTANCEEDUCATION (DE)

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The pace of modern life sets its own rules. Sometimes we have to work simultaneously, take care of children, keep the house, etc. But also we need to find time for education, without it moving up the career ladder is not easy and sometimes impossible. The way out is distance learning. This kind of studying provides an opportunity to gain knowledge without interruption in work and household chores, and even there is a chance to get a diploma. But there are some pros and cons.

To begin with, media education is a great opportunity to increase your knowledge and get a diploma, no matter whether you live in the capital or in the country or even abroad. Because this form of learning is convenient for disabled people, young mothers, housewives and even military. Most schools and universities of distance learning require student's personal presence only for passing the state exam and thesis defense.

What is more, education via the Internet, compared with internal and extramural form of studying, is cheaper. Some universities even offer the opportunity to receive free distance education on a competitive basis. Also, this way of learning helps avoid the costs, without which ordinary students can not handle, such as books and stationery.
In addition, in the virtual world, as in the walls of the institute, essays and exam papers are being written, but without typical student fear and nervous tension.

On the other hand, the main disadvantage is that it is not possible even theoretically to become a specialist in some kind of job without practice, such as a doctor. So if you don’t have a medical education, learning such an important and responsible profession remotely is impossible nowadays. This applies to creative professions such as acting, music education, ballet.

Doubtless, students who connect with distance education must want to learn. Studying on the internet makes hard to control you by teachers. Therefore this form of education is used by adults and independent people who understand why they need knowledge and diploma.

And the last but not least, distance education in Ukraine is not highly developed as it is abroad, because of the technical and legislative gaps. It is quality can sometimes lose to traditional forms of studying.

To conclude, one can say that distance education is developing rapidly in many countries, but for Ukraine it is a relatively new type of education. In addition to numerous financial, technical and other difficulties, a serious problem is the lack of literature on DE. The fundamental idea of DE (both full-time and part-time) is "movement of students to knowledge" to the "movement of knowledge to students." Using DE methods can help us receive a quality education in remote areas without interruption in your main job, teach people with disabilities, significantly reduce transportation costs to receive education and so on. Also using modern electronic communication allows video contact between a student and a teacher, who may be hundreds or thousands of miles away from each other.

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WYVERN: THE ENVIRONMENT MERGING SEVERAL PROGRAMMING LANGUAGES

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The global network environment could be more secure, if not the vulnerability arising due to using a conventional approach to programming – gas a result of mixing with the main program elements of various technologies, such as a sequence of SQL-queries, javascript-code to implement interaction with a user. However, software engineers from the Carnegie Malone University found a way to protect the environment above threats, which helps protect both websites and users’ computers, and in this way a new programming system Wyvern has been developed, which
allows the use of several completely different programming languages for creating a computer program.

Wyvern (the name of a project) is a kind of meta-language. It allows programmers to develop applications and web pages using all the capabilities and features of programming languages and scripts – for example, SQL for database queries or HTML, CSS and JavaScript to build Web pages. Moreover, the language can fully operate it, so there is no need to use complex and potentially dangerous methods of circumvention in cases where multiple languages are needed.

Combining different languages is often required to display the content on websites. Most of the words and images that we see on pages are coded in HTML and CSS, or processed in real time according to PHP-request or as a file downloaded from the server. These complex queries take a long time and require careful testing, which can be avoided owing to the language Wyvern. It “understands” and identifies requests and data processing facilities as a fixed value in this type of language.

The Wyvern system is not the only such project, which is designed to implement the technology of meta-programming in different languages. There are also other projects, such as ProteaJ, Scheme, OJ and Spoofax, which consider the above problems from different angles. But the creators of Wyvern claim that their system provides maximum balance between functionality and ease of use that will allow using the system software to create multi-lingual programs.

Wyvern is not ready for full use. But due to further development of the system, it will grow into a new one with new features and functions and, in the end, it may become a viable thing. Those who want to experiment with the system Wyvern now can do so by referring to the page of the project at a certain service GitHub.

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QUANTUM COMPUTING

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The idea of quantum computing was developed by Yuri Manin in 1980. Richard Feynman suggested one of the first models of a quantum computer. Soon Paul Benioff introduced a theoretical basis for its construction.

The architecture of quantum computers is fundamentally different from that of conventional PCs. They are based on the latest achievements of modern physics. The algorithms that are used in quantum computing use effects of quantum parallelism and quantum entanglement. This leads to the presence of a large number of registers and speeds up the calculation process.
Nowadays quantum computers are needed to solve many scientific problems. For example, they can simulate complex biological systems. Quantum computers can instantly perform calculations for which the conventional computer would need years. Calculation speed is particularly important for theoretical physics. Modern science is looking for the Theory of Everything, which consists of complex equations. Detectors at the Large Hadron Collider get a huge amount of information per second. Quantum computers can process this information very quickly.

Famous corporation Google has been interested in quantum computing for several years. In 2013 the search giant acquired a D-Wave quantum computer. Recently, Google and NASA have teamed up to research artificial intelligence using quantum computer based on the D-Wave System working with 512 qubits.

Google engineers have tested the performance of the quantum computer D-Wave 2. It shows the performance that is 35.5 thousand times more powerful than the possibility of the conventional computer.

The disadvantage of this system lies in the presence of errors in calculations. System error rate in D-Wave 2 is relatively small, but when handling a large amount of data it may lead to a significant error. That is why we can’t assert the creation of a full-fledged quantum computer.

IBM has also made progress in quantum computing. IBM Research will enable engineers to start working on the creation of a full-fledged quantum computer. They shared their achievements at the annual meeting of American Physical Society. IBM uses superconducting qubits instead of traditional silicon semiconductors. California and Yale University are also involved in similar research. However, IBM claims that only their company has resources for the production of quantum computing chips. Current accuracy of the physical processes is 95%, but the company aims to reach a level of 99%.

Therefore, the development of quantum computers is necessary for reaching a new level of technology. At the moment, we are far from the creation of the real quantum computer, but the best scientists around the world have already achieved fantastic success.

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THE SMARTEST PROGRAMMING LANGUAGE

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Just 5 years ago no one could even think about an ideal programming language, for operating which, you need not to be a skilled computer programmer. But on 2nd June of last year Apple Inc. announced a multiple paradigm, designed on the base of iOS and OS X developers, opened a completely new horizon in the history of computer programming. It is mainly used under Cocoa frameworks. The code is so much easy that even an average programmer can operate it in an enormous speed of time with a great comfort. The language is so much simple that the simplest apps of mobile phone can be embedded through it.

In has already received appreciation from various computer programming geniuses like Facebook programming guru Andrei Alexandrescu. The compatibility of this program has been compared with Objective C by many others. But most of them have put Swift before Objective C. They have explained the main reason of it that Swift has a much comfortable and regular syntaxes than Objective C, by which any person can fit with it very easily. Another feature of this language is that, it contains an excellent playground surfaces. It means you can observe the progress of program while you are programming instantaneously. It indicates that the program runs in a great speed, making raw codes into the simplest apps on your mobile phone or computer and consequently those mobile apps run into a great speed. The experts mentioned it as the main reason that everyone is leaning towards Swift.

The start of Swift began four years ago in summer, 2010 by recent young graduate of University of Illinois, joined in 2005 in Apple Inc. as a specialist, Chris Lattner. At that time he has already showed his geniuses in his student life, while working under Vikram Adve, making the LLVM system, the basic foundation of Xcode 6.0, which has been downloaded for fourteen million times. Four years ago, he alone started the project of Swift, about which he didn’t tell any word to anyone. Working in constraint for days and nights, working-days and weekends for one and a half year, he decided to disclose it to a few high ranking executives of Apple Inc. Observing and valuing the project, they understood the positive aspects and future impacts of this masterpiece on programming industry. After that they have recruited some specialists with him on that project. They continued their work and the last two years they were the main focus of Apple Inc. On this regard, Vikram Adve commented that he was in touch about Chris Lattner’s time dominated project, but what it was actually was unknown to him also.

Swift contains many algorithms from Ruby, Python, C++, C#, Objective C, Jcosure, Java scripts etc. But you have to consider it as a new one. It’s true that when any language forms it needs a long time take its place in people’s mind. As it doesn’t use other familiar languages as it is a language on its own. On that ground, the gross success of Swift has already surpassed Microsoft’s C# and Java scripts which were introduced in early 90’s and 2000. It is clear that Apple is trying to invent its own
form to create its own framework. Such kind of attempts have been taken by Facebook through Hack and D, by Google through Go in 2009 etc. In comparison with them Swift has been obtaining immense success for the last eight months. In the last year on 9th September and 22nd October 1.0 and 1.1 Gold versions were released respectively.

GOOD CODE WRITING IN OBJECT-ORIENTED PROGRAMMING LANGUAGES

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Every programmer has his own style of code writing which influences the end result, especially in object-oriented programming languages. There are many reasons for this influence, such as performance, consistency, quality of the program, but the main reason consists in an understanding of the code by other programmers. Nowadays the majority of serious projects are carried out by a team of programmers; thus, if the code is not understandable, a lot of difficulties may arise, which makes the problem of programming styles very important and up-to-date.

Valuable elements of good code writing include simplicity of program instructions assigned to each programming step, readability (there should be enough spaces between operators, variables and functions, enough newlines, tabulation should comply with the written code), instructions for ambiguous code parts that make the code easier to understand (comments, logical names of variables, functions and classes). Programmers who need to create a compound code name use “camelCase” or “under_score”, i.e. writing practices that specify exactly appointment of the class, function or variable.

In a well-written code each function is responsible for carrying out a particular task, which enables each code function to be used many times in different program parts (so called “code reuse”). For the same reason, code reuse is of great importance to private functions and variables, i.e. class fields that can be used only in their own class since no other class is able to operate them.

Another important feature of a good coding style is division of classes into two logical parts: 1) interface classes that input data entered by the user and display output data on the screen; 2) implementation classes that process data inside the program and do not contact the user. This division allows the same implementation code to be used by different interfaces. Instead of rewriting the whole program, the programmer changes the interface code while the implementation code remains intact; it helps to save time and avoid additional bugs.

When writing the code, programmers should remember that the program is written for the average user; thus, the interface should be simple, the design minimalistic. The program should be protected from the user’s incorrect actions from the inside and provide the user with the algorithm of error correction in case it is
needed. Nowadays all of the features mentioned above are typical for a user-friendly interface.

It is also advisable to use standard functions in the code as they are tested many times; this will ensure the programmer that the program is free from bugs and errors, that may occur when the standard code is rewritten.

Therefore, the code should be logical, understandable, with simple functions and a user-friendly, but minimalistic interface. To achieve a high-quality result the programmer should not write a new code, but rather reuse the existing code proved to be reliable. Each popular programming language has its own basic coding convention which may also help in code refactoring and automation of development tasks, and it is crucial for successful work of the development teams.

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THE USE OF PAPER SHEET AS A TOUCH SCREEN
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Fujitsu has developed a technology that allows the elements to bring interactivity to a sheet of paper with text printed on it. This concept of printed materials processes and transfers them into digital form.

Computer vision system tracks the contours of the fingers and their height above the work surface. This allows you to “allocate” snippets of text and images on a paper document with your finger in the same way as it is done on devices with touch screen. Isolated fragments instantly scanned and projected onto a work surface, after which they can move and zoom with gestures and touches. Unlike Kinetic or interactive whiteboards here does not require any special sensors, sensors or markers.

This system includes a projector, a computer, a web camera and software. Camera monitors the user's actions camera.

The principle of operation is as follows: you put a sheet of paper under the projector and one finger highlights desired paragraph or image, as if the touch screen tablet. The device analyzes your team measures the shape and size of the selection and transfers the data to the computer. To avoid unnecessary commands caused by involuntary movements, highlight text will only need one finger instead of the whole hand.

Camera resolution is only 320 by 180 pixels, so the finger movement should be very clear, otherwise the image moves up. Initially images are rather vague, but in the process of computer processing program calculates the coordinates of the image and adds image, making it as clear as possible.
The advantage of this device is also that the computer can transfer data not only to flat sheets of paper but also of thick books. The system also includes control of brightness and color.

The company plans to launch its creation in commercial production by 2014. While the inventions are a demo version and future devices requires some modifications. Engineers plan to conduct interactive tests with real people to understand what it lacks functions users for maximum comfort.

This technology has a great future, it is very promising. Its further development will provide new opportunities to work with paper documents, education and many other areas.

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MASHUP AND WEB 2.0 TECHNOLOGY

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Web 2.0 can be described as a basic set of principles common to all applications that wears the label Web 2.0. These principles are service, simplicity and community. After consideration of these principles some of the technologies that are used for them should be examined.

One of the first of principles that should be examined is simplicity for developers. Due to the open industry standards and low barrier to use with many powerful technologies simplifies usage and software development for certain types of applications. This increases the effective range of developers and affordable Web-based applications. In creating community, this aspect proves its effectiveness.

The second one can be simplicity for users. For example you can see that today's Web-based applications provides the user with rich content and experience. And with the advent of Ajax, called Asynchronous JavaScript + XML, distinction between traditional stand-alone and Web-based applications erode or disappear at all. Modern Web-based applications beyond model Web 1.0 that reloads page to view new content, provide a full-featured interactive user experience.

Due to the success, based on feeds of technology, users can now subscribe to syndicated content, which provides specific information that they need for the industry through standard technologies and protocols. Now feeds allow you to pack and transmit information in a specialized format, providing convenience of consumption and mixing. This is consistent with the general trend: the software makes the way free for information to fully disclose the value of information. As a result, service owners find that the information they provide is used productively in ways they did not foresee.
Mashup is a concept of building Web applications by mixing the functionality of different APIs and data sources into one application. Principle of mashup creation was directly borrowed from pop music, which first appeared direction the music genre mashup, which consisted of a mixture of vocal and instrumental tracks collected from different music. The term mashup applies only to those projects that use open API interfaces for these services.

Architecture of any mashup consists of three main parts, linked physically or logically. ISP Data API – a content providers origin of the information. Mashup site – an online application, which is collected and placed information from providers of content information obtained through open API. For mashup applications work can be used different technologies to implement them. Ajax – is a model of web-applications. Soap and Rest – a platform of independent web-protocols for communication with remote services. Rest – the architectural style of software distribution systems, such as the World Wide Web. Soap – Access Protocol objects. Used to exchange arbitrary messages in XML. Customers can use SOAP and REST to interact with remote services. Features fully transmitted through the service description messages, in which a request and response.

So, using traditional processes and methods of application development leads to a low payback through situational nature of business. Also payback can be improved by using domain knowledge and technology that has qualified users in the context of mashup-ecosystem that allows users to compose situational applications quickly.

ADVANTAGES AND DISADVANTAGES OF MODERN COMMUNICATION NETWORKS
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Nowadays many people use various means of communication. These tools range from regular mail to the Internet. By regular mail people can just write letters and send small parcels. On the Internet, people can not only talk but also interact with a web camera and a microphone. Communications in the modern world play almost decisive role. The data transfer speed is important, but equally important is the reliability of the channel, as well as their protection, so developers are constantly improving equipment and provide the user with all the new tools. Even the smallest office is incomplete without access to a global network, telephone and LAN.

The following basic types of communications are classified:
– Wired communication uses wired lines;
– Radiorelay Communication is based on the principle of relaying;
– Tropospheric Communication is based on the principle of long-distance tropospheric reflection;
Satellite Communications is one of the most common forms of communications based on the principle of relaying a signal via satellite.

Modern communications systems include an assemblage of types of communication in one communications system. This communications system allows you to make calls, video calls, video conferencing, data and other information exchange worldwide. Each user of telecommunications services does not reflect what route information passes to tie together two subscribers for calls or data transfer.

The availability of modern technology and communications systems has many privileges. Many people who communicate with each other and at the same time see the interlocutor feel more relaxed. This is the first advantage. Means of communication help us to communicate with relatives, friends who do not live in the same city with us. Now we increasingly began to use the phone to call a friend or a girlfriend to ask him or her out, ask classmates for a homework, etc. Often humorous shows point out how many women love to gossip on the phone with their friends. It is also an advantage. Increasingly, pupils and students use the Internet for writing essays, reports, and create interesting presentations with sound and graphics. The Internet is becoming more and more used means of communication. With means of communication, we can manage our financial savings, buy, sell, chat, meet and do many other interesting things.

The most well-known disadvantage of modern means of communication is blurred vision after spending time with the phones and the Internet. This is especially true of those who read a lot program, are engaged in development of web sites. Very poor eyesight is characteristic of people whose work involves the use of computing system. People are even used to see all programmers wearing glasses or lenses. But there is a lack of any advantage. People who work with computers retire early.

The second drawback is in some cases a waste of time. Due to the fact that a lot of people talk on the phone or on the Internet, they do not have time for more important things, such as visiting relatives, workout, helping parents at home. Often all this is faced by adolescents or young men.

The third disadvantage is that many communication services are very expensive and not everyone on the planet can afford a phone or the Internet.

As you can see there are more advantages than disadvantages in the use of modern means of communication and it pleases. We hope that the scope of Telecommunications will evolve and provide us with many new opportunities. But still there is a need to protect people’s eyesight and time and try to spend less time in conversations with friends by means of communications systems, because it is better to talk with friends in real life.

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To date, the using of web resources is very popular. Millions of people are registering with social networks, chat forums, make purchases through online stores, read news and search some information on the Internet. And many people do not care how this system works, how it can be viewed a particular page. The companies provide services and care about their users. Thus Rasmus Lerdorf create the programming language PHP. Firstly, it was a simple application that analyzed users who visited his resume on the website. And so it has become crazy popularity.

PHP (Hypertext Preprocessor) – scripting programming language was created to generate HTML-pages on web server. PHP is one of the most common languages used in web development (including Java, .NET, Perl, Python, Ruby). PHP is supported by the majority of hosting providers. PHP is open source software project.

PHP is interpreted by a web server in the HTML-code which is transmitted to the client. In contrast to the scripting language JavaScript, the user does not see PHP-code with browser but getting ready html-code. This is an advantage in terms of safety. But nothing prohibits to use PHP for generating JavaScript-codes which are executed at the client side.

PHP – language code can be embedded directly into the html-code pages and those pages will be correctly handled by PHP-interpreter. PHP-interpreter just begins to execute code after the opening tag (<?php) and continues execution until closing tag (?>).

A wide variety of PHP functions makes it possible to avoid writing multi-functions.

– The presence of many interfaces to databases: PHP has built-in library for working with MySQL, PostgreSQL, mSQL, Oracle, dbm, Hyperware, Informix, InterBase, Sybase. Via standard open interface connection to databases (Open Database Connectivity Standard - ODBC) you can connect to all databases to which there is a driver.

– Conventionality: It will seem familiar for PHP programmers who working in different branches. Many language constructs are borrowed from C, Perl. PHP code is very similar to the one found in typical applications in C or Pascal. This significantly reduces the initial efforts for the studding of PHP. PHP is specially designed for working on the Internet and combines the advantages of Perl and C. It has universal and clear syntax. Although PHP is fairly young language, it has gained such popularity among web-programmers in our time that it is almost the most popular language for building web applications (scripts).

– Availability of source code: Strategy Open Source, and distribution of source code programs among the masses, undoubtedly had a beneficial effect on many projects, especially - Linux though Apache project success greatly strengthened
the position of the supporters of Open Source. This applies to the history of PHP, because customer support from around the world was a very important factor in the development of the project PHP. Adoption of Open Source strategy and free distribution of source code PHP has provided an invaluable service to users. In addition, PHP users around the world is a kind of collective support team, and a popular e-conferences can find answers to even the most complex issues.

Effectiveness: Efficiency is an important factor in programming environments for multiplayer, which include web. An important advantage of PHP is that the language belongs to the query. This allows scripts to handle relatively high speed. It is estimated that the majority of PHP-scripts (especially not very large) are processed faster than they are similar programs written in Perl. But even that did the developers of PHP, binaries obtained through compilation work faster - in the tens and sometimes hundreds of times. But the performance of PHP enough to create quite serious web applications.

So, in my opinion, PHP is the best programming language for creating web pages and applications and if you have to face this type of programming resources, I would advise you exactly PHP language.

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INFORMATION AND PSYCHOLOGICAL IMPACT

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Information and psychological impact (IPsV) is the influence on the consciousness and subconsciousness of an individual and population in the whole in order to change their behavior and mindset.

Information and psychological impact has long been used for intimidation, fraud, bribery, blackmail and threats of the enemy, to influence his behavior. In the wars of the XX century implementation of information and psychological influence became particularly large scale, it was a large-scale, deliberate, carefully planned deceptive action. It turned out that information and psychological means can very effectively influence the intellectual activity, mind, consciousness, subconscious of enemy political and military leadership and personnel of his troops (forces) and the population against which military operations are conducted. Therefore, information and psychological impact has become a powerful tool for information warfare. Now it has become an integral part of the information war in hostilities.

The basic method of IPsV is belief and suggestion. The algorithm of persuasion and suggestion is as follows: the belief is turned to his own critical target of perception of reality. It has some influence algorithms according to which: logic conviction should be available to intelligence receptors; to exercise persuasion, based
on the facts known to object; convincing information should include generalized propositions; beliefs contain logically consistent constructs; facts coming to the receptors must have the appropriate emotional colouring.

Suggestion, by contrast, is aimed at actors who uncritically accept information. Its features are: commitment and planning of applications; concrete identification of the object of suggestion (selective impact on certain groups based on their basic socio-psychological, national and other characteristics); uncritical acceptance of information by a subject of suggestion (suggestion is based on the effect of the perception of information as instructions to operate without its logical analysis);

Certainty and concrete behavior initiated (object must receive instructions for specific reactions and actions consistent with the purpose of influence).

The level of efficiency of IPsV depends on the following conditions: the content of the material: its complexity, specificity, social importance, etc. For example, under equal conditions the simpler information, the more likely that the actions to which it leads, can be performed automatically, especially when they are not contrary to the belief of the object. That is, the more specific a call to action is, the higher the degree of automaticity response; mental condition that is characterized by a high level of automation response. Fear, depression, apathy contribute to uncritical and unconscious perception of influence. The degree of automaticity in reply of a person is associated with the level of awareness and criticality of information perception. If the effect is perceived unconsciously and uncritically, the response of the audience may be automatic; time interval between exposure and corresponding reaction. With increasing the time interval the automatic reaction is reduced due to increased criticality and mental activity of an object (explained by the inclusion of the content of the information obtained in individual knowledge and understanding of it).

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RISK MANAGEMENT FOR INFORMATION SECURITY

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People are always seeking security. They try to avoid the risks that threaten their lives. It is the survival instinct. Henry Fayol expressed the aim of risk management as a guard person against thefts, flood and fire, prevention buffet and felonies and all social agitations or natural occurrence liable to endanger the progress and even the business. Police or army fulfils this role in the case of the state. Potential risks that might occur in the future are not excluded. Also we do not limit the range of risk to the environment conditions. Problems within organizations occur because
many crises in the economy and the financial services happen. The term risk is bounded to the possibility of deviation. This means that the possibility of risk can be expressed as a probability, ranging from 0 to 100 percent. Therefore, the truth is neither impossible nor definite. In this concept the definition expediting is perfect key. It is used to define the benchmark. Any irregular expectations will distort the measurement of risk substantially. The risk can be determined as a rejection of the result we want. This is called standby. The risk can be expressed as the probability of deviation from the desired result.

Risk management is a scientific approach to detection and prevention of threats and pure risk management. All managers and organizations have to face risk management. Risks are everywhere and they in turn derived from unpredictable events. This circulation process of identifying, evaluating and managing risks brings business to achieve strategic objectives. But it will be clear that not everything can be controlled. A risk manager is a person who is responsible for all risk management processes in the organization. Risk management identifies business management function that a scientific approach to the problem of risk in the organization and makes it available to all managers. In the world there are more and more organizations which elaborate international standards of Risk Management and other methods to improve the quality of production and reduce damages.

Actuality of the problem with risks in information security increased sufficiently lately. High progress and globalization of information technology influenced our society. Now the process of IT implementation and appliance in the society helps to reveal risk or threat in any process in security system and to prevent interception of information. The basis for successful risk management is to ensure strategic decisions. When there is a high risk that decisions are based on available information. For more effective risk management it is necessary to ensure the reliability of all the processes involved in decision making. Risk management is a process that can be divided into several stages, described as identifying, analyzing, evaluating, treating, monitoring and reviewing risk. Sometimes risk can be defined as the uncertainty of results.

To sum up, we can state that this method is the most necessary for Ukrainian business, because these changes will positively influence Ukrainian economy. If we have high quality products, interesting projects, etc., that can attract investment in Ukraine. The USA and Europe use international standards to achieve success. But we have not yet. The Risk Management is only the first phase for progress in our production while absence of risk is the key to success.

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THE CONCEPT OF ENTERPRISE PORTAL FOR A DEPARTMENT OF AN UNIVERSITY

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Activities of the university department are associated with the exchange of documents, information, formulation and execution of tasks, orders, instructions. Currently university does not have automated tools and systems for management of these processes, monitoring their performance, saving history and information materials. These tasks are usually executed either in paper form or via e-mail. This approach slows down work, breaks deadlines, resulting in loss of information or making it irrelevant at the time of transfer.

The purpose of this work is to present the concept and model of corporate portal for university department and determine its implementation by combining business processes of the department in one system.

The developed system supports following business processes:
- saving all files in a single repository to provide quick and reliable search and access control;
- organization of incoming, outgoing and internal document workflow;
- monitoring execution of the tasks assigned to employees of the department;
- organization of effective communication between department staff.

The system developed consists of the following subsystems:
- subsystem “Accounting of logistics” can keep track of equipment available on the department, its technical conditions;
- subsystem “Workflow” manages a repository of documents and files, controls sharing of documents and files between users and allows to search data in them;
- subsystem “Tasks monitoring” allows you to create, assign tasks to other users and monitor their execution;
- subsystem “Messaging” allows users to exchange messages with each other, including conversations with several participants, and add messages to documents and files;
- subsystem “Account management” allows portal administrators to register, delete users, set access levels. Registered users can enter the system using the login and password provided by the administrator.

Portal should be structured, should have a section of news and help centre. Members should be able to search data and have access to various services, such as forums, discussion groups, documents, and others.

Information systems of the portal can be combined by similar design of information pages or individual elements, logos, banners, etc.; sole or similar user interface to query and search tools. The basis for the integration of information
systems in the portal is Internet protocols including data transfer protocol TCP / IP communication protocol and HTTP.

All categories of users can exchange messages, files and documents with other users of the system and can manage their own repository of files and documents (add, delete files and documents, search for files and documents).

Users with “Employee of the department” role can also create tasks for other employees of the department, monitor their execution by viewing and writing comments to the task.

Users with “Administrator” role can add information about new equipment at the department, discovered defects in the equipment, monitor documents that are processed by the system, edit existing information and generate relevant reports.

Users with “Administrator” role can keep track of all accounts in the system.

Software is developed in the Ruby language using MVC framework Ruby on Rails 4, with DBMS PostgreSQL 9.3. Access to the database is provided by graphical user interface consisting of standard HTML-pages giving a friendly interface and familiar to most Internet users.

Developed database consists of eleven tables. Table User contains data about users; Position table contains information about job positions at the department; Table UserHasPosition contains data about employees positions; Table Conversation contains conversations; ConversationHasUser table contains data about the participants of each conversation; table Message contains data about messages in conversations; Document table stores information about the attributes of the document; File table includes information about the path to the files; DocumentHasFile table contains information about the contents of documents; table Task contains all tasks of the employees and Equipment table contains data about equipment and its technical condition.

To conclude I’d like to pay attention that the enterprise portal system described above has some key benefits:

- **complexity** – use of modern technologies and models for combining and processing information will create a portal that provides a complete set of information services that are required by its users to solve their professional problems;
- **practical orientation** – the implementation of information and educational technologies on existing computers and telecommunication resources, taking into account interests of each user group;
- **versatility** – proposed architectural solutions make it possible to implement innovative technology today; solution is almost invariant to the telecommunications infrastructure of computer network;
- **the reality of the decisions** that follow from the concept of the portal.

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PROJECT MANAGEMENT SYSTEMS IN IT COMPANIES

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Nowadays, information technologies are rapidly developing, generating a high level of competition between IT companies. An important factor of the success of software developments is not only the quality but also the speed of their creation. This requires that the process of project management has to be clearly established and continuously monitored. Therefore, it is difficult to overestimate the importance of user-friendly tools for project management.

Project management, as it was defined in national standard ANSI PMBoK, is a sphere of activity which defines project goals balancing between work amounts and different resources (such as money, labor, materials, energy, space etc.), time, quality and risk.

Modern project management methodologies are designed to ensure efficiency, rationality and effective risk management during the project. Nowadays there is a lot of software designed to make project management as easy as possible. However, when choosing a system for managing IT projects, it is necessary to take into account the specific nature of doing such projects, which considerably narrows the range of such systems available today.

IT projects usually have high intensity combined with deep detailed calendar network diagrams and iterational actions. Unlike other types of projects, non-labor resources and materials are tracked much less in such projects. Often there is a need of integrating a management system for IT projects with other systems - first of all, with CASE-tools, systems, CRM (Customer Relationship Management systems), VCS (version control systems).

There are two types of management software for IT projects: Desktop and Web-based. Desktop system installs on each user's computer and provides the most flexible interface. Such programs usually allow you to store information in a file that can be accessed by other users, because of data stored in a central database. If it’s a Web-based software (Web applications), access to the program is possible only by using a browser. The advantage of such system is that it is accessible from any computer, and there is no need to install special software. However, such type of the system is slower than the desktop one and in case of server problems the system becomes unavailable to users.

Also IT projects are characterized by a high probability of risks so it is very important to be able to forecast and minimize risks. An aspect of risk management subsystem is monitoring and making reports. The most widespread examples include the following forms of documentation of risk management in IT: project manager’s report, project risk log, issues log. Such reports should be generated by project management system automatically.

The existing IT project management systems are usually based on specific project management methodology. Currently, among the most common practices
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and approaches of managing IT projects are PMI (International Institute of nonprofit project management), IPMA (International Project Management Association), PRINCE2 (Central Computer and Telecommunication Agency UK), MSF (Microsoft Corporation), RUP (Corporation Rational Software), a set of models CMMI (Carnegie Mellon University), and a group of Agile methodologies, including Scrum.

These methodologies in a certain way define and describe the life cycle of IT project, the end result of which is the software product. A project’s life cycle typically includes making requirements, design and implementation of the product, its verification and testing, and further support.

When choosing IT project management system there are following basic requirements and goals: creating and control of many projects; breaking projects into tasks, tasks in its turn – into smaller subtasks, etc.; sorting and filtering tasks by various criteria (deadline, type, status, etc.); commenting on tasks and sharing files of different formats; internal messaging between project participants; employee scheduling and resource management; recording the time spent on tasks; accounting budget; providing information about the workload; providing information about the project, viewing and changing the status of the tasks; early warning of the risks associated with the project; constructing of structures of subordination; reporting system; system alarms (by e-mail, RSS-feeds); integration with version control systems; usability; system cost.

The most popular IT project management systems currently are Jira, Readmine, Planio, Lighthouse, ComindWare, Basecamp, Intervals and others.

So, as we can see, the management of IT projects is intensively developing and improving. After all, information technology is a perfect environment for the implementation and automation of new methodologies for project management.

However, each of the existing system has both pros and cons, which indicates the need for developing such system that combines all the advantages of existing products, including availability, flexibility, adaptability, integration with version control systems, bugtracking, reporting and user-friendly interface. A system with all these features and functionality will guarantee a successful project management in IT companies.

References:
THE ENTERPRISE ENERGY AUDIT MEASURING AND CONTROL SYSTEM

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The relevance of tested system is that it allows the real-time display to state enterprise energy parameters and to react to critical changes necessary to preserve the characteristics of the production process.

Safety technology cycles depend on the efficiency of operator's actions over the tools of influence on the production process. The possibility of such action provides the test system, which receives information on all the main characteristics of the measuring equipment and monitors changes in the monitored parameters automatically.

Scientific novelty of the test system is the organization of communication channels between gauging tools companies that provide both reliability and resistance to emergencies. Requirements of reliability across the enterprise meets RS-485 interface. However, the gap wire communication can provoke the inability to obtain information from all test vehicles. To ensure resistance to emergency situations involving rupture leading communication interface used ring structure with providing software and hardware routing packets measurement data in two directions (“Left” or “Right”). Software implementation solution uses the TCP and IP stack TCP / IP.

The system is built on the principle of Master-Slave to the distribution of roles during the installation phase of the conversation protocol TCP. To be able to provide wireless communications test system incorporates GSM channel for transmission of information through the HTML protocol.

Measuring and control system provides inspection, analysis of efficiency of energy generation and energy to identify possible energy cost savings.

Practical application: test system audit provides a collection of data on the energy state enterprises with signal generation of critical state for prompt response operator.

Gathering information about the state of energy nodes is provided by placing sensors on various energy blocks and gauges enterprise processes. Sensors placed on the ring circuit with the ability to set direction poll: left and right. Test system manages the creation / logout, information sharing, synchronization and definition of roles for Master-Slave communication.

References:

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INTRODUCTION IN WINDOWS PRESENTATION FOUNDATION
AND XAML

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Nowadays, IT branch evolves all over time. There is creates new technologies, develops existing ones. Today i will tell you about very popular technology Windows presentation foundation(WPF) and markup programming language XAML(eXtensible Application Markup Language).Windows presentation foundation is similar to constructor, which includes UI(User Interface) elements such as labels, buttons etc.

For creating any application you need IDE (Integrated Develop Environment). The best IDE for creating WPF applications is Visual Studio. Let’s create our first WPF application for considering major concepts of WPF and XAML. For creating WPF application push File->Create->Project->Choose target .Net Framework platform->Choose name of project->Create. There are appeared two windows. First window is MainWindow.xaml. Second window is MainWindow.xaml.cs.MainWindow.xaml consist of some xaml code. Visual studio have created already window by adding two namespaces.

First namespace include basic types and tools for creating wpf application xmlns=“http://schemas.microsoft.com/winfx/2006/xaml/presentation.”.xmlns is attribute for declaring namespaces. Second namespace is namespace that include basic xaml properties,that allow to influence how your program is interpreted xmlns:x= http://schemas.microsoft.com/winfx/2006/xaml.x is prefix that reference to the namespace that contain program entry point.x: class attribute refers to the class, which inherit from window class.

MainWindow.xaml.cs include some c# code, that implement interaction between user and program. First of all we see here a lot of namespaces. You can understand most of them if you know English. For example System.Windows. Controls include tools designed for controlling application such Button, checkbox, radio button etc. If you want your application properly working, you need create partial class(class which situated in several files).It is important to inherit it from Window class. When we inherit some class from window class, it means that everything what user do with window declared in this class. There are three ways to create application. Let’s create some little example.

```xml
<Window
    xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
    xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml" Title="Some window"
    x:Class="letsbegin.Program" ResizeMode="NoResize">
    <Grid>
        <Button Content="Some Button" Width="80" Height="40"
```
Here is written content of MainWindow.xaml file.
All elements in XAML describe by open and close tag. For example
<Window> Content in the window buttons etc</Window>. Also in program is represented MainWindow.xaml.cs file. Here is code.

```csharp
using System.Windows;
using System.Windows.Controls;
namespace letsbegin
{
    public partial class Program : Window
    {
        public Program()
        {
            InitializeComponent();
        }

        private void Button_Click_1(object sender, RoutedEventArgs e)
        {
            MessageBox.Show("Hello");
        }
    }
}
```

`InitializeComponent();` - Method for initializing wpf application.

Application has following appearance.

Button-Click_1 - method which implements when user push the button. This method also show following message.

I hope I made learning WPF, easier for you. If you want to be good .Net developer you need to know WPF and XAML.

**References:**
OCULUS RIFT

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Oculus Rift is a virtual reality helmet. It allows you to see the picture, move and manage it with, for example, head movements. It’s interesting to note that you find yourself in another world, the parallel reality, where you can completely go deep!

This development is particularly relevant in the following areas:

1. In computer games.
2. In medicine:
   – preparation to surgical interventions;
   – treatment phobia (arachnophobia – Spider World);
   – reduction of pain in patients with burns (Snow World);
   – treatment veterans of 'hot spots' with PTSD.
3. In military sphere, for unmanned control. In 2014, the Norwegian military conducted an experiment management with armored vehicles using Oculus Rift.
4. In education, where it is necessary to simulate the situation.
5. In space projects, for example, NASA uses Oculus Rift and Omni in JPL Laboratory for virtual exploring the surface of Mars and the ISS.
6. In social networks. In March 25, 2014 the company Oculus VR (developer) was acquired by Facebook for US $ 2 billion; Although Oculus Rift positioned solely as a device for computer games, Mark Zuckerberg announced that he sees in the Oculus Rift virtual reality devices and the basis for a new generation of computer technology, which can replace smartphones.

To sum up, this development will obtain popularity in almost all spheres of activity. Considering computer games, the user can immerse into the game to be a direct participant. 3D-games is provided with a helmet, for example, Half-Life 2, Team Fortress 2, Mirror's Edge.

Taking into account disadvantages, Oculus Rift can cause ripples in eyes, motion sickness and nausea. The developers claim that the new products (DK1 and later) can solve this problem.

One reason for the side effects is a long delay between turns heads and updating pictures. It can be solved using a sensor with a higher sampling rate and special software technologies such as a motion prediction and the so-called “time warp”. Another significant reason is a long period of display pixels, characteristics of all LCD panels in general, as well as a very long time of pixel shifts in a particular
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panel. A low period creates very strong erosion – in DK2 (later version); the problem can be solved using an OLED low period screen display so-called “low persistence”, where pixels light only for a very short period of time, instead of blinking like a conventional display.

References:

INTELLIGENT SELECTIVE VOLTMETER

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One of the most necessary devices is the multirange selective voltmeter, which is keeping high precision of measurements in the wide range of low and high frequencies, in various conditions of radio practice engineering.

The intelligent selective voltmeter (further – the voltmeter) is designed to measure voltage in the certain range of frequencies. It is applied at measurement of amplitudes of intricate signals at a separate frequency (for example, to measurement of amplitude of signals in the presence of noise).

Sphere of application are: the organizations specializing on production of electric energy, smelters of designing of radio engineering, technology of measure to hindrances, and other.

Technical and economy justification – creation of the voltmeter which is improved at new element base, achievement of the minimum error, satisfaction to inquiries of the consumer at cost.

Technical characteristics of the device should conform to the technical requirements GOST 8.119-85 (The state system of ensuring unity of measurements. Voltmeters electronic selective) and have to the following characteristics:
- range of measurement of amplitude of an entrance signal "0 … 1000 V":
  - in the range of voltage from 0 to 0,001 V;
  - in the range of voltage from 0 to 0,01 V;
  - in the range of voltage from 0 to 0,1 V;
  - in the range of voltage from 0 to 1 V;
  - in the range of voltage from 0 to 10 V;
  - in the range of voltage from 0 to 100 V;
  - in the range of voltage from 0 to 1000 V;
- range of measurement of frequencies "10 Hz … 100 kHz":
  - in the range of frequency from 10 to 100 Hz;
  - in the range of frequency from 100 to 1000 Hz;
  - in the range of frequency from 1 kHz up to 100 kHz.
- the limit of the main given error of measurement of amplitude – 0,2 %.
The voltmeter under development should keep the metrological characteristics and working capacity at impact on it of the industrial radio noise which isn't exceeding the norms provided in “The general norms of admissible industrial radio noises”.

The voltmeter allows continuous work in operating conditions of application at preservation of the technical characteristics within the norms established to during time, not less than 24 h. Average time between failures to the voltmeter less than 15000 h.

Besides, in a design there has to be a function of automatic switching of the frequency characteristic of the filter for search of the maximum value of amplitude.

The voltmeter consists of the high-quality reconstructed selective amplifiers therefore it is convenient for research of signals in the presence of hindrances.

The principle of operation of the voltmeter is based in allocation of separate harmonious components of a signal or signal of a narrow strip of frequencies by means of the reconstructed strip filter.

The amplifier normalizing sensitivity of the device is installed on an entrance. The amplifier radio frequency (ARF) is applied to protection against extra band signals. After passing of the input device the signal arrives at the converter, where is transformation of frequency of entrance signal to intermediate frequency by means of a heterodyne there is on which the filter intermediate frequency is configured. The filtration signal is carried by bandpass filter (thanks to the fixed value of frequency of setup of the amplifier of intermediate frequency this amplifier has big coefficient of strengthening and a narrow pass-band that provides high sensitivity and selectivity of the selective voltmeter) in the amplifier of intermediate frequency, and then it has detected. The system of automatic fine tuning of the calibrator and frequency of a heterodyne under the frequency of an entrance signal is used in analyzers of harmonicas for good stability of intermediate frequency. The signal arrives on the amplifier and the indicator device from a detector exit.

The indicator device consists of the digital measuring instrument which shows signal amplitude at the chosen frequency and mechanical or electronic devices which show the chosen frequency.

The block and function diagram on which calculations are made during the course of performance of work. Also, the results had summarized, where device merits and demerits by results of the calculated errors are specified at the end of work.

References:
4. Website UIIDE moodle.kpi.ua
Nowadays cloud computing is rapidly developing and becoming more and more widespread. The “cloud” has always been a metaphor for the Internet. As a virtual space that connects users from all over the globe, the Internet is like a cloud sharing information by way of satellite networks.

Basically this term describes delivery of computing as a service rather than a product. Shared resources, software and information are provided to computers and other devices as a metered service over a network, first of all over the Internet. Computing clouds provide computation, software, data access and storage resources without requiring cloud users to know the location and other details of the computing infrastructure itself.

Cloud computing is the result of evolution and adoption of existing technologies and paradigms. The goal of cloud computing is to allow users to take benefit from all of these technologies without the need for deep knowledge about or expertise with each one of them.

There are several fundamental models of cloud computing:

- **Infrastructure as a Service (IaaS)**;
- **Software as a Service (SaaS)**;
- **Platform as a Service (PaaS)**.

  - IaaS is such a model of cloud computing where a customer buys access to raw computing hardware over the Internet, such as servers or storage. For example, web hosting is IaaS: a customer pays a monthly subscription or a per-megabyte/gigabyte fee to have a hosting company serve up files for his website from their servers. The most popular examples of this model of cloud computing are Amazon Elastic Compute Cloud and Simple Storage Service, Google App Engine and Aptana Cloud.

  - SaaS is a software delivery business model in which a provider or third party hosts an application and makes it available to customers on a subscription basis. SaaS customers use the software running on the provider’s infrastructure on a pay-as-you-go basis. So basically users borrow online software instead of actually purchasing and installing it on their own computers. The best-known examples of SaaS are Google Docs and Web-based emails.

  - In the PaaS models, cloud providers deliver a computing platform, which typically includes operating system, database, programming language execution environment and web server. Thus, developers can code and run their software solutions on a cloud platform without the cost and complexity of buying and managing the underlying hardware and software layers. PaaS is generally suitable for brand-new applications, as legacy applications often require extensive refactoring to comply with sandbox rules. Google App Engine is a great example of PaaS.
But, as every new technology, cloud computing has its pros and cons. One of the main advantages is that it increases mobility, as you can access your documents from any device from anywhere in the world. This means that people can work from home or on business trips, without having to carry around documents. This increases productivity and allows faster exchange of information. Employees can also work on the same document simultaneously without having to be in the same place. Using of cloud computing provides increasing the reliability of information storage while you only pay for what you used. The main disadvantages are higher ongoing operating costs and greater dependency on service providers and Internet connection. Also potential privacy and security risks are important aspects of using cloud computing.

Nevertheless cloud computing technology has made a huge impact on application development in general, and it definitely has a great potential in providing the highest possible levels of efficiency, reliability and performance at the right price.

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PROTECTED SMARTPHONE
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With the development of modern technologies we can observe the developing of modern crime. Moreover, we cannot be sure, that all our information is confidence. Government services spy for our telephone calls, messaging, or communication in the network. I think this thing is the main idea, which motivates us to think about creating secure mobile phone.

Firstly, we can encrypt our telephone calls, SMS, etc. with the simplest encryption methods, like RSA encryption. It will give us a possibility to save our information from government spies. But this process will take more time and communication will not be comfortable, because of losing time for encryption.

Secondly, it will be more difficult for other hackers to decrypt our calls, which is encrypted with the help of GSM standard, too.

Finally, we can protect all the data on our smartphones by using special apps. But we cannot be sure, that this app really works.

There also exist other problems. Both subscribers must have special software and this software must use the same encryption standards. Of course, it will take
Silent Circle announced the Blackphone smartphone focused on confidentiality. Google Android is chosen as an operating system which passed series of serious changes for the sake of security and safety and following the results was renamed like the PrivatOS.

Silent Circle is engaged in cryptographic decisions: in its portfolio tools for the ciphered voice negotiations, video communication and an exchange of text messages on computers and smartphones are assembled. One of the company founders is Philipp Zimmerman, the guru in safety issues and the founder of Pretty Good Privacy (PGP), popular means of e-mail enciphering.

For the safety in the smartphone such tools are used: Silent Suite, a package of the Silent Circle tools, consisting of the following things: Silent Phone (will organize the peer ciphered VoIP-calls), Silent Text (the same in relation to SMS), Silent Contacts (substitutes a factory Android-application of the telephone book that contacts did not steal third-party programs).

Thus we can make the following conclusions:
– security communication is great idea and there is approximately one company, which works in this direction.
– We will hope, that smartphones, like Blackphone will be cheaper and we will be able to save our personal information.

References:

INFORMATION SECURITY
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Given the dynamics of globalization and information technology (hereinafter – IT) implementation and use of IT in most areas of today's social life gained outstanding importance.

Development means of interactive communication and information exchange:
– social networks;
– e-mail exchange;
– instant messaging;
– video and Internet telephony.
Types of information security:
– Technical protection of information (aims to provide means for engineering activities and / or software and hardware prevent leakage, destruction and blocking, violation of the integrity and mode of access to it).
Cryptographic protection of information (implemented by transforming information using special (key) data in order to hide / restore content data, confirming its authenticity, integrity, authorship and more.).

The most common types of contemporary computer threats:
1. malicious software (Malware);
2. Internet fraud;
3. unauthorized access to information resources and information and telecommunication systems;
4. botnets
5. DDoS-attack (Distributed Denial of Service);
6. theft of funds;
7. “identity theft”.

In order to systematize knowledge of the main approaches to information security and safe use information technology developed a number of recommendations in abstracts as described below. Watch for updating the operating system and other software you are using. Use a software firewall (firewall) and full-time protection against malicious software. Use antivirus software and regularly update virus signature database. Backup data by saving them on removable storage media (CD / DVD, HDD, etc.); I set “System Restore.” Work on ARM under a user account that has administrative privileges. Do not leave the workstation “unattended” – block session by pressing “Win + L”. Use resistant passwords and ensure their regular shift; not store authentication information in an easily accessible place. Sticking to the policy of “clear screen” and “net jobs”.

When using the services of Internet banking, email, etc., it is necessary to input data authentication ensuring that a secure connection using HTTPS.

Be attentive to instances of Internet fraud. Do not connect to public (unprotected) wireless networks; The method of social engineering is focused on information / technical component of an information system, and the man as the weakest link of this interaction. The main objective of this method – force the user to perform actions necessary to defeat an attacker ARM. Today this method is the most common lesion in the information space.

International information security standards:
- ISO / IEC 27001 – the international standard for information security, developed jointly by the International Organization for Standardization and the International Electrotechnical Commission.

References:
SECTION 5. SOCIAL SCIENCES

CAUSATIVE CONSTRUCTIONS IN MODERN ENGLISH

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The causative constructions issue was studied by many different scientists all over the world. Among them are: A. P. Komarov, V. P. Nedjalkov, H. H. Silnitskiy, L. H. Kovalska, N. S. Beron, V. F. Velivchenko, S. D. Katsnelson, V. V. Rjabenko, S. A. Shyvalova, F. M. Muller, V. von Humboldt, J. Lyons, etc.

The term causativity in Linguistics is defined as an array of language phenomena which are combined on the basis of common meaning of causativity.

In modern Linguistics causal connections are understood as those that have inherent nonrandom relation of events in nature, society and social life.

Causation is realized with the help of integrated system of verbal and non-verbal markers in modern English discourse.

The basic terms in the category of causativity research are concepts “situation of causativity” and “causative construction”. Situation of causativity is realized by constructions of causative relationships which occur between person and things, phenomena, actions, events, processes and states.

A causative construction is a language model of reference to the situation of causativity – macro-situation which consists of not less than two micro-situations connected by the causation relationships.

There are three essential elements in causative construction: antecedent, consequent and causation relationship.

English causative constructions have great research interest. This phenomena is usually studied from the point of relationships of cause and effect.

The causative construction is a construction that has stimulating meaning, i.e. subject does not perform an action by himself/herself but stimulates somebody else to do it.

Typical causative construction from the point of syntax may consist of three components: verb-predicate, object (noun or pronoun), predicative complement, or four (verb, object, preposition, infinitive or gerund).

The main role in these constructions belongs to verb.

The causative constructions are universal constructions of the Indo-European languages.

The causative constructions are those which core the causative verb is.

English linguist J. Lyons investigates the concept of causative through the system of verb.

Verbs that indicate the situation if causativity, i.e. macro-situation where one simple situation is cause and other is effect, are called causative verbs.
To the category of causative verbs belong every verb that has semantic feature to “cause” independently whether there is the only semantic feature or the word has extra ones that characterize action-cause and action-effect.

There are causative verbs in the English as well as Ukrainian language that is why there are no difficulties in translation.

References:

STRUCTURAL AND LEXICO-SEMANTIC PECULIARITIES OF TERMS IN ELECTRONICS
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The terminology of electronics is considered to be a separate structure. In English as well as in Ukrainian, these terminological systems are open lexicosemantic groups that are in state of continuous movement and gradual improvement. Such linguists as B.N.Golovin, G.O.Vinokur O.S.Akhmanova, V.M.Leichik and others have contributed a lot into the process of the research, connected with technical terminology.

The borrowing of foreign units occurs during the time of development of science and technology, and signifies that this type of lexics largely meet the needs of terminological nomination. Today, the process of borrowing from English is being intensified and deserves preferential attention. Suffixes and prefixes in the English terminology system are mostly borrowed from common words in English. Exploring the morphological structure of terms, we can conclude that grammatical processing can be expressed by:

1. Prefixation: all-band antenna - широкодіапазонна антенна; counterclockwise mode – режим з лівої круговою поляризацією; exchange field – поле обміну.


With the above-mentioned examples we can see that \textit{N + N} model is dominant in the formation of complex terminology in electronics because nouns make up the biggest part of it. The process of compounding according to this scheme creates the
opportunities to nominate the objects and existing phenomena. The class of nouns is essential in representing the vocabulary of electronics terminology.

In the formation of compound words the question of the semantic content of structural models is extremely important. In most cases, the first component of the structural model $N + N \rightarrow N$ specifies the value of another element: conduction ratio – коефіцієнт провідності; ground current – струм заземлення; bridge connection - мостове з'єднання.

Among the following complex terminology formation methods we distinguish common lexical units formed with the help of model $\text{Adj} + N \rightarrow N$. This type of compounding has the second largest group among lexical units, For example: auxiliary arm – допоміжне плече; elementary frequency – основна частота; interharmonic component – інтергармонічна складова.

In the English electronics texts a prominent ratio is taken by abbreviations. As they operate independently in the lexico-graphical sources and are often known, they can be considered full lexical units of scientific and technical language.

Abbreviations are formed from the initial letters of the words. For example: AA (antenna array) – антенна решітка, RWM (read-write memory) – оперативна пам’ять.

This terminological system is characterized by the following ways of enrichment:

• morphological method (affixes);
• semantic implementation (when a commonly used word acquires special meaning);
• different types of borrowings.

As for vocabulary of electronics industry, it can be classified into three main areas of research:

1. vacuum electronics;
2. solid-state electronics;
3. quantum electronics.

Each subfield, in its turn, is divided into a number of sections and a number of directions. Each section combines systems of homogeneous physical and chemical phenomena and processes that are fundamental to the development of many classes of electronic devices this area.

These directions include:

• methods of design planning and computations of electronic devices, related to the way of processing or functions (dip soldering – пайка зануренням; electron-beam welding – електронно-променеве зварювання; electrophoretic deposition – electroфоретичне осадження);
• materials (columbium – колумбій; allyl plastics – пластмаси на основі аллілової смоли);
• technology of fabrication (destructive interference – деструктивна інтерференція);
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• machinery (abrasion machine – абразивна установка; color picture tube – кольоровий кінескоп; alloy-diffused transistor – диффузійно-сплавний транзистор).

Having regarded the structural composition and semantical peculiarities of the terms of electronics, the subgroups of this field, which are classified according to the methods of designing, materials and technology used, we may confirm that electronics terms exist as a certain subsystem of the language which has its specific realization in speech. English is much richer in electronics terminology, that is why English borrowings are actively used in Ukrainian.

References:

THE NARRATIVE ORGANIZATION OF ENGLISH MODERNIST TEXT

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Modernist text is a phenomenon that appeared in the beginning of the XX century to reflect drastic changes in social and cultural life of the time. Modernists incited a revolution in the stagnating world of literature by introducing unusual means of narration, description, transmission of inner feelings and thoughts of a hero. The main artistic techniques used by them were inner monologue, stream of consciousness and installation, altogether representing a unique field of exploration for linguists and philologists. The research on this subject is far from being over, which may mean that some important scientific aspects concerning the narrative organization of modernist texts are still to be discovered. Nevertheless, it is already possible to make a general analysis of the modernist narration techniques.

The study of narratology offers an extensive system of theoretical, abstract and logically defined concepts that are of a great use in this particular research. On the empirical level, the supporting communication instances are as follows: a writer (the real author) – a literary and artistic work (artistic and imaginative world) – a recipient (the real reader). When it comes to the text itself, narratology presents their conceptual equivalents: an implicit author (a narrator) – a narrative or a narrative form – implicit reader.

These and some other principles of narratology, when applied to three novels written by the most renowned representatives of literary modernism, which are “Ulysses” by James Joyce, “Mrs. Dalloway” by Virginia Woolf and “Absalom, Absalom!” by William Faulkner, allow us to signify the most peculiar traits of each
writer’s style of narration. Thus, the driving force of the novel "Mrs. Dalloway" is an internal monologue showing short-term impressions and experiences that the narrator tries to share with the reader. "Absalom, Absalom!" represents chaotic receptive change of projections that, at the first glance, are an obstacle on the way to understanding the richness of literary work, but actually support its extremely intricate structure, and "Ulysses" is an example of creating a novel with the use of combined construction or montage, which expands reader’s space for thinking and makes each event described in the book much more lifelike. Each of these authors has created a unique technique of projecting the events on the inner world of man, reflecting its perception of the outside world.

To sum up, the possibilities that become available via the exploration of modernist narration techniques are quite inexhaustible and can be of a great value for the scientists of many spheres, including philology, linguistics, psychology, sociology etc. However, it is necessary to carry on with the research as so many aspects of modernist work remain an obscure entity.

References:

IMPLICITNESS IN THE DISCOURSE

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The thesis is dedicated to the problem of implicitness in the discourse. This particular semantic category is of great interest nowadays, at the time when the world is witnessing host of speeches and articles regarding current political atmosphere in Europe, thus genuine understanding is indispensable.

The notion of implicitness was defined on the basis of works by such notable scientists as V. Bagdasaryan and N. Panina. Implicitness is the type of conceptual relations based on the reflection of real dependences in consciousness, i.e. mental analogue of real relations. Its main manifestations are shortenings, elliptical sentences and diplomatic speech [1:3].

Quality of the text depends on the communicative parameters and the objective, set by an author. Personal attitude may not be expressed explicitly, but supposed to be decoded by the recipient on his own.

The connection between the form and the content can be extremely intricate and contradictory. Implication comes up as a result of difference between the formal and semantic structure of an utterance which is frequently observed. Majority of scholars tend to treat an implication as something that is inferred [2:188]. By saying A, the speaker probably implies B, C and D. Or we can specify our own model of the context and say that for us A implies E, F or G".
Implicitness phenomena surely exists on the interlingual level and hampers the task for translators. Example:

Doing is better than saying.

Вирішити – цеозначаєрозпочатидіяти.

In order to make an accurate translation it is needed to fall back on several transformations impossible without perfect understanding of the intrinsic sense. In another case translation will sound unnaturally and quite strange.

References:


PECULIARITIES OF TRANSLATION OF ENGLISH SCIENCE-TECHNICAL TERMINOLOGY

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The modern language development is characterized by a considerable quantitative growth of terms in different fields of science and technology as well as their active penetration in spoken language, the process of its intellectualization, completion of the vocabulary with new units. Due to the rapid development of the scientific and technical information the problems of the study of the functioning of terms in the process of scientific and technical translation become more and more urgent.

The article is devoted to the main difficulties of translation of technical terms of scientific and technical terminology in English.

The terms are used to create precise definitions of the notions of science and technology area. Most researchers admit that terminology is one of the main stylistic features of the scientific style, the informative core of the vocabulary of science.

Such scientists as V.I. Karaban, T.R. Kyiak, A.V. Superanska, T.A. Kazakova, Y.I. Retsker and many others have worked on the peculiarities and methods of science and technical translation.

Linguists have indicated translation of terms as one of the main difficulties of technical translation, due to the ambiguity of their meaning, lack of translation equivalents (in terms of neologisms) and national variability.

In particular, the main difficulties of translation of scientific and technical terms are in the existence of the synonymic terms, polysemantic terms, homonymic terms and neologisms, which do not have translational equivalents.
Thus, there is a large number of terms different in form and expressing one and the same concept or phenomenon of reality. These are called synonyemic terms, such as: “moving staircase, escalator”, meaning “ескалатор”; “frame, apparatus, device, guide”, meaning “пристрій”.

Therefore, to avoid synonyemicity, which is not acceptable within the same terminology field, one should rely on certain criteria, such as quantitative estimation of the motivation of the term derived from the comparison of its internal form (literal meaning) and lexical meaning (dictionary definition). Consequently, the accuracy of motivation – is a level of meaning resemblance in the internal form of the word and the degree of motivation – is the simple average between the accuracy and the completeness. Ergo, in such cases, in choosing the right synonym the more motivated term would be preferable.

Moreover, polysemy (ambiguity) we distinguish as the presence in a word of several connected with each other meanings which usually occur as a result of the interaction and development of the primary meaning of a word. Polysemy terms can occur both in the narrow specialized terms so as in widely used ones which can have several meanings even within the same termino-system. For example, term “абакус” had the primary meaning of “абак” in mechanical engineering, i.e. “лічильна дошка”, later its definitions “координатна сітка, сітчата номограмма” appeared in terminology of electronics.

As for interbranch and intrabranch homonymy of terms, V. I. Karaban writes that it is a phenomenon in which lexical units are identical in form, but quite different in meaning. Homonymy of terms is very common because of the form of semantic derivation that is widely used in the terminology of various fields of science and technology, i.e. when the current form of the word is given another specific meaning. For example, the word “leader” in physics means "a spark or gas discharge"; in mining - "a ram guide of a pile driver"; in metalwork - "cold screw". It is clear that the character of the meaning of such homonymous term is defined by the original belonging of the term to a particular field of science and technology and the specific subjects of the original text. However, mistakes in translation can still occur due to the wrong choice of meaning of the homonymous term from the related sciences or technology.

Special attention in translation of scientific and technical terms is also required to the so-called "false friends" of the interpreter, i.e. lexical units that are similar in external and internal form, therefore evoking false association due to the fact that they have different meaning in the opportunity of the semantic variation of this linguistic unit. For example, the term “resin” means “смола” and not the Ukrainian “резина”, which would actually be “rubber” in English.

However, one of the most difficult group of lexical units for translation constitute the words in quotes, which can be neologisms, occasionalism, borrowings from another terminology, words used in ironic sense, or metaphors.

So, when the dictionary does not provide the exact equivalent of terminological unit, when there are no variation matches in the target language, or if
the term is ambiguous, various techniques of interlanguage transformations are used. The task of the translator lies in the right choice of a method of transformation in order to convey the meaning of the term as accurately as possible.

The translational transformations are subdivided into lexical, grammatical and stylistic. Transformations can be combined with each other becoming complex.

There exist different approaches to building the typology of translational transformation.

To the number of the most common lexical transformations we can attribute: transcoding, tracing, instantiation, generalization, meaning development, translation by description.

Furthermore, L.S. Barchudarov denotes 4 basic grammatical transformations: permutation; replacement; adding; omitting.

To summarize, regardless of the degree of the interpreter’s skills in both languages, the scope of his/her background knowledge, (s)he is going to come across the unexpected in the original text, which may be linguistic or extralinguistic realities. Given this, besides dictionaries the translator should know and be able to use various handbooks as well as master his/her skills in choosing the right translational transformation.

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AMBIENT MEDIA AS AN EFFECTIVE TOOL IN PROMOTING PRODUCTS IN TODAY’S MARKET OF UKRAINE

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Last time there is a decrease in the use of advertising in traditional media. This is due to the increasing of the amount of advertising, and accordingly, the decreasing of a contact time with the advertisement. It is also worth, that advertising space in the printed media and on TV is quite expensive. At the same time in an unstable political and economic situation in Ukraine, that’s why advertisers are forced to reduce advertising budgets, and at the same time to think about effective promotion of their product. Thus, alternative advertising spaces in protracted crisis conditions are gaining even more relevance today.

Ambient Media adapts to the environment and accompanies the consumer in unusual places where it is difficult to ignore the advertising message. Visually Ambient Media – is non-standard advertising, which focuses on the placement. It is designed to surprise people. This advertisement penetrates to the places where it is not expected to see. This is its main advantage. After all, people in the modern world
used to ignore most of the classical advertising. In contrast to this, Ambient makes consumers pay attention to it.

The idea of Ambient Media was first used in the second half of the 90s in the UK. Today, it has little in common with traditional media. Today Ambient Media is very popular, although it is still quite an unusual method, and many marketers treat it with caution.

The main distinguishing features of Ambient Media:

- penetrates the atmosphere of the target audience (advertising on the floor in the bathroom of the club, on the handle of the cart in the supermarket, on the handle of the bus);
- non-standard, high degree of creativity and innovation, thereby attracting attention;
- easily planned. Is not important to reach a large audience, but it is important to establish high-quality contacts with potential clients;
- relative cheapness: as the advertising message is placed in a completely unexpected place not intended for advertising, the cost is much lower than the cost of outdoor, magazine, television or radio advertising.

According to marketing research, Ambient Media is more effective than Internet advertising or advertising in cinemas, as well as the cost of one contact here is cheaper. At the same time, Ambient Media allows you to reach a niche of audience that traditional advertising media cannot reach. It is worth to remember, that the modern consumer diligently and deliberately avoids contacting with ATL-advertising.

The main task of Ambient Media is efficient use of channels, which are not communication in fact.

Ambient Media helps:

- to attract consumer’s attention to the brand;
- to increase the level of loyalty;
- to identify the brand in the competitive environment;
- to influence the audience purposefully;
- to create the effect of surprise;
- to provide a high frequency of contact, and so on.

Weaknesses of Ambient Media include the fact that this type of advertising cannot be operated for a long time by one media. When consumers become accustomed to the appearance of advertising in a particular place, the message loses its unusualness. As a result, attention and reaction of an audience weakens. This means that the thin line which separates the ambient-media and standard media vehicles can eventually disappear. And time of disappearing is determined by the period of habituation of the audience to a particular solution.

Weaknesses also include the difficulty of calculating the cost of advertising exposure, so placing such advertising, it is necessary to rely not on the amount of advertising contacts, but on their quality. It is also important to consider the fact that
there is so-called Ambient Media effect – interesting ads are photographed by consumers and distributed over the network as an interesting sight. It is an unprecedented advantage of this type of advertising communication.

Ambient Media is especially popular in social advertising. This is due to the fact that the average consumer rarely draws attention to the usual advertising, and even rarer – to the social one. The leading countries of the world often use Ambient Media for social needs. For example, in France there were placed crosses right on the sidewalk. On top of such crosses were placed messages stating that dozens of homeless die every day in winter. This action made many people to pay their attention on this issue. It is noteworthy that homeless people died exactly on the same sidewalks, were crosses were placed.

Today in Ukraine there is a favorable situation for the development of Ambient Media. This is due not only to the high cost of traditional advertising media, but also the fact that they are so fed up to the consumer that he has ceased to notice even the creative innovations in advertising appeals. In addition, the market of Ambient Media in Ukraine is absolutely vacant and is in its infancy.

In conclusion, it should be noted that alternative advertising media became vital in a time when traditional advertising began to decline its effectiveness and it became difficult to deliver a message to a targeted group.

Taking into account the maximum amount of benefits and the minimum number of shortcomings, it is possible to predict that the development of Ambient Media on Ukrainian advertising market will progress, and the popularity of this tool will only grow up.

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CORPORATE SOCIAL RESPONSIBILITY AS A WAY TO INCREASE PROFITS
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Corporate social responsibility has been very popular amongst companies and top corporations. Especially in the 21st century when environmental concerns, human rights, labor rights, fair trade and many other concerns are becoming increasingly important to consumers, stakeholders and companies alike. However the exact definition and the effectiveness of corporate social responsibility is often very vague and confusing to others. This paper will explore in depth of what exactly is corporate social responsibility, how companies are motivated to incorporating CSR into their
ideals, business strategies and what actions do these companies take in order to become a socially responsible corporation.

Corporate social responsibility is not something that is required by the law for businesses to follow and implement. Often companies do decide to incorporate CSR into their business strategies because it will eventually help improve financial performance and improve the company image.[1] Many believe that success with corporate social responsibility strategies within a company will also lead to success in financial performance too.

Based on the surveys from the three panels branding, value maximization, stakeholdership and profit maximization are ranked as top priority for motivating managers to engage in CSR.

For the past year, there are top 10 responsible companies, which are, for sure, known all over the world. Among them, Google – the leader for the fourth year, Microsoft, The Walt Disney Company, and BMW remain aloft in top spots from previous years [2].

It is impossible to see immediate results from corporate social responsibility practice however most businesses knows that CSR practice will help them in the long run. Every company is different as they have different structures, cultures and as a result are in different stages of corporate social responsibility. However, each of these companies is working towards becoming more socially responsible as they face various struggles and problems.

It's like the age-old question, "If a tree falls in the woods, and there is no one there to hear it, does it make a sound?" But instead the question goes, "If a company does well and no one in social media is talking about it, does it make a sale?" It's not wrong for companies to want people to know how socially responsible actions impacts sales. After all, let's not forget that companies do a lot of good just by selling their products. They give people jobs, healthcare, retirements and great product innovations. Plus, if doing well can deliver greater bottom-line profitability, then the companies can do more good. And you know who works at companies, people. And people want to do well.

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LINGUISTIC MEANS OF EXPRESSION OF EVALUATION IN ADVERTISEMENT

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At present stage of its development advertisement can be defined as a mass communication through the media and other means of communication initiated by
individuals, social groups and organizations. The fundamental purpose of advertising is the influence on potential customers, their tastes and preferences, to induce to purchase certain goods/services. In advertising discourse a wide the range of possible mechanisms is used to have an influence on the audience and therefore in such texts there is fairly high concentration of different means of expression, one of which is the evaluation.

A language of advertising and its impact on potential customers have been the subject of various studies: types and subtypes of advertisement (Ogorodnikova E.M., Baryabyn A.V., Ch. Mundy Edwards), the concept of evaluation and its characteristics as a linguistic category (Pasynek V.G., Vasylenko V.A.) evaluative component of text and language means of expression of evaluation in advertising texts (Moscheva S.V., Kozyolova E.I.). The topicality of this work rely on the fact that there are still some poorly investigated aspects concerning the researched topic, such as means of creation and expression of evaluation in English advertising and specificity of its functioning in different types of advertising texts. Also prevention of inaccuracies and misunderstandings caused by the translation without saving the category of evaluation is very important for linguistic theory and practice of intercultural communication.

According to the dictionary of linguistic terms by Olga Akhmanova, evaluation it is the opinion of the speaker, his attitude – approval or disapproval, desires, encouragement and so on; one of the main parts of stylistic connotation. The image of goods is the basis on which the advertising message is built and which dictates choice of means of product presentation from visual to linguistic ones. The basis for building the image of product is to create a positive picture of the object of advertising which is achieved through the use of linguistic means of expression of evaluation.

As the evaluative aspect of meaning, evaluation is present in a variety of language expressions. It may be limited by elements less than a word and at the same time can characterize a group of words or the whole expression. Evaluative expressions include subject, object and the basis of evaluation. The subject of evaluative structure implies a person, a part of society or society as a whole, from standpoint of which evaluation is done. The object of evaluation is an estimated object. The basis of evaluation is a feature or features of the object which help to render the evaluation.

Evaluation is one of the major linguistic categories, which is directly involved in the organization of verbal communication. The category of evaluation appears at all language levels. The ability to be evaluated is the main feature of predicate in the structure of evaluation, which is implemented in two meanings – good/bad. Language evaluation depending on its nature and character can be of three types and three subtypes. Types of evaluation are the following: neutral, positive and negative. Subtypes of evaluation can be intellectual and logical, emotional and emotionally intellectual. The scholars also distinguish absolute and comparative, true and false evaluation. In advertising discourse positive evaluation, regardless of whether it is true or false, dominates in quantitative terms over the negative at all language
levels. Therefore the axiological background of advertising messages is positive and it is typical for the style of advertisement.

In the advertising text, in order to attract the attention of potential customers and encourage them to purchase goods, certain lexical and grammatical means of expression of evaluation are used. The analysis of advertising texts showed that the usage of words with emotional and evaluative connotations helps to create a positive perception of advertising text and the image of advertised product. The most common parts of speech used in advertising texts for evaluation of the product are nouns and qualitative adjectives. Nevertheless, verbs are also used for this purpose, often, the most effective is the use of verbs in imperative mood (\textit{just do it}; \textit{think different}; \textit{eat fresh}). Among the other widespread lexical means of expression of evaluation in advertising discourse it is necessary to mention the hyperbole (\textit{total quality, it is lifetime}), amplification (accumulation of synonyms and hyperbolic comparisons): \textit{first class service}, degrees of comparison (\textit{for better living, the longest lasting beauty}), qualitative and evaluative antonyms (\textit{We work, you play}), «built-in» evaluation (feature of the object is put next to his name, becoming an essential attribute of the product): Kodak RoyalGold, Mmm Danone, Fabulous Las Vegas). When talking about word formation, lexemes formed with the help of prefixes super-, extra-, ultra- are used at a great extent (\textit{ultraboost, superbreathing, ExtraVolume}).

The method of compounding is also effective: \textit{the orangemost drink (orange + most); chexellent (Chex + excellent)} — advertisement of cereals «Frosted Chex».

Emotional and evaluative effect is also achieved in the advertising text due to syntactic means such as:

- interrogative sentences: «Why does Carapelli make 4 different kinds of oil? – \textit{For the same reason Latin has 7 different words for LOVE}» — advertisement of olive oil manufacturer.
- rhetorical questions: «Doesn't your dog deserve ALPO?» — advertisement of dog food manufacturer;
- narrative sentences (in such sentences is evaluation is present because they express an advice, or an already proven fact or a personal opinion, etc.): «\textit{We know the things you have to do to satisfy customers. Which is why, at Energis, we match them by providing the best telecoms and internet services for your business. That in turn, means being able to quickly adapt to any changes in your business}» — advertisement of service «Energis». Advertising text is built in the form of advice, supported by a set of arguments that create a positive evaluation of this service;
- repetitions: «\textit{Totally new, totally clear, totally beautiful}» — advertisement of cosmetics line Clearasil;
- parallel constructions (substitution of one concept, generally positive for a person, by the other): «\textit{You give us 22 minutes, we'll give you the world}» — advertisement of WINS Radio, New York.
- incomplete sentences (in advertising texts they are often built by the model of subordinate clauses with the absence of the main sentence. Evaluation is expressed implicitly):
«Givenchy – Because I'm addicted!» — advertisement of French perfume line «Givenchy».

Thus, using a variety of advantages of lexical, morphological and syntactic structure of the language, it is possible to express the evaluation in advertising text and thereby actively influence the target audience.

**References:**

**STRUCTURAL AND SEMANTIC PECULIARITIES OF WELDING TERMS, THEIR TRANSLATION INTO UKRAINIAN**

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Advancements in the fields of science and technology result into the emergence of numerous terms. Therefore, nowadays special attention is being paid to the investigation of structural and semantic features of the terms and adequate means of their translation.

The structural and semantic potential of the term, as well as its word-building paradigm is the field of interest of many linguists, such as A. S. Gerd, V. P. Danylenko, M. N. Volodina, S. L. Mishlanova, V. N. Prohorova, A. V. Superanska, T. L. Kandelaki and many others.

Semantics, structure and means of translation of terms are closely interconnected and influence one another. Unfortunately, the research of the terms in the welding industry has not yet been done. In this article we will outline the most characteristic features of welding terminology concerning its structural, semantic and translation peculiarities.

The semantic structure of the term is determined by the internal form of the term, that is its structure. On the basis of a certain internal organization and a common generic concept, the terms in the welding industry can be divided into the following lexical-semantic groups:

- welding technology;
- welding equipment;
- welding materials.

Based on the classification of A. Y. Kovalenko the following **structural groups** have been found among the welding terms:
- simple terms: *to anneal, an ingot, a mould*;
- compound terms: *flywheel, metal-arc*;
Welding terms tend to be of a multicomponent structure. This can be explained by the desire to express all the differential features of newly-made terms and provide most of the semantic accuracy. It would be reasonable to classify multicomponent terms according to the number of components constituting them:

1. consisting of two components: butt weld, injector torch;
2. consisting of three components: oxyfuel gas cutting, double lap joint;
3. polycomponent: half-open corner joint, gas metal arc welding.

Furthermore, multicomponent terms in the welding industry may be examined concerning their syntactic structure. Considering the parts of speech the following models are the most frequent:

- Noun+Noun: weld metal, fusion welding, pressure welding;
- Adj+N: flush joint, intermittent weld, anticorrosive coating;
- Participle I+Noun: nitriding atmosphere, reinforcing steel;
- Participle II+Noun: submerged welding, hotrolled steel;
- Noun+Noun+Noun: electron beam welding, carbon electrode welding;
- Noun+Adjective+Noun: gas isostatic pressing, heat-resistant coating;
- Adjective+Noun+Noun: square edge joint, bright chrome plating;
- Noun+Participle I+Noun: wear-resisting steel, corrosion-resisting alloy;
- Noun+Participle II+Noun: heat-affected zone;
- Adjective+Adjective+Noun: soft magnetic steel, hard magnetic alloy;
- Participle II+Adjective+Noun: pulsed arc welding, shielded arc welding;
- Adverb+Adjective+Noun: highly porous material;
- Adverb+Participle II+Noun: rapidly solidified powder;
- Numeral+Noun+Noun: double action pressing;
- Adjective+Adjective+Noun+Noun: full open corner joint;
- Adjective+Noun+Noun+Noun: single fillet lap joint;
- Participle II+Adjective+Participle I+Noun: leaded free cutting steel

With a preposition: aerosol of metallic powder.

When translating compound terms and terms – word-combinations, the analysis of semantic relations between the term components and their adequate translation with the help of transformations plays an important role. A translator should bear in mind lexical and grammatical differences between the English and Ukrainian languages that require transformations of syntactic structure and lexical changes. Since lexicology and grammar are closely intertwined, that leads to the mixed lexical and grammatical transformations while translating.

In case of simple and compound terms in the welding industry, mostly lexical translation transformations are used, for example:

- Equivalent (alloying – легуючий; molten – розплавлений);
- Transcoding (acrit – акрит; antiferromagnetism – антиферомагнетизм);
- Explication (formability – здатність приймати форму; interface – поверхня зіткнення зварюваних деталей);
• Concretization (consumable – плавкий; energise – пропускати струм).

As to the terms – word-combinations, the application of lexical transformations is much more diverse:

• Calking (anatomic alloy – анатомічний сплав; arc welding – дугове зварювання);
• Transcoding (Aich metal – Айх-метал; misch metal – міш-метал);
• Explication (square butt joint – образне стикове з’єднання з криволінійним скосом двох кромок);
• Meaning development (zone of fusion penetration – зона проплавлення);
• Concretization (deposited metal – наплавлений метал; sheet steel – тонколистова сталь);
• Generalization (acetylene welding – газове зварювання);
• Complex review (toughness test – випробування на в’язкість руйнування).

While translating the terms – word-combinations, grammatical translation transformations are actively used:

• Permutation (weld metal – метал шва; soft magnetic steel – магнітно-м’яка сталь);
• Substitution (levitation melting – левітаційне плавлення; activation addition – активуюча добавка);
• Addition (shot blasting – дробеструменева обробка; impulse quenching – гартування з імпульсним нагріванням);
• Omission (low-melting-point metal – легкоплавкий метал; light-metal alloy – легкий сплав).

Still, most of the translation transformations are mixed, for example:

• Permutation+substitution (elastic limit – межа пружності);
• Permutation+addition (compression test – випробування на стискання).

So, we made an attempt of systematizing the structural, semantic and translation peculiarities of the welding terminology. This is an ever-increasing bulk of linguistic units that require thorough investigation and is sure to gain more and more interest among the specialists of this field.

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Nowadays, incredibly rapid development of information technology and increasing desire of enrichment caused the necessity to protect people who invented something interesting and unique from unfair use.

In our country State Intellectual Property Service of Ukraine is responsible for protection of intellectual property. The bill "On amendments to some legislative acts in the field of intellectual property" was developed in this organization. Main functions of this institution are: implementation of the state policy in the field of intellectual property; submission to the Minister proposals concerning state policy in the field of intellectual property. It should be noted that currently citizens protect rights on the results of their intellectual, scientific and creative activity in the court, that is, "everyone has the right to go to court to protect their personal non-property or proprietary right "[2; Article 16]; in the case of damage to the plaintiff, court determines the amount of compensation - it can be as compensation in full and damages in the amount of benefits received by violator using intellectual property of the plaintiff, furthermore the plaintiff has the right to sue not only to damages but also to non-pecuniary damage.

Under current law, losses are considered [2, Article 22]: 1) the losses experienced by a person in connection with the destruction or damage of items and costs that person has spent or should spend to restore his violated rights (actual losses); 2) income that a person could actually obtain under normal circumstances, if his right was not violated (lost profits). Thus, considering the case on the protection of intellectual property, the court must take into account not only caused damages, but also possible damage that the offender could cause.

According to the law moral damage is [2, Article 23]: 1) physical pain and suffering, which the individual has suffered due to injury or other impairment of health; 2) mental suffering which an individual has suffered due to the wrongful conduct towards himself or his family members; 3) the distress which the individual has suffered due to the destruction or damage of the property; 4) humiliation of honor and dignity of individual, as well as business reputation of a natural or legal entity.

Due to the current law, the plaintiff is entitled to monetary compensation ranging from 10 to 50 000 minimum wages instead of compensation for losses or recovery of income (used as an alternative in case of failure to determine damages and the amount of income received by the offender). Specific circumstances of the case and the general principles of civil law, namely fairness, honesty and reasonableness should be taken into consideration while determining the amount of such compensation [2; Article 3]. Compensation is payable in case of proof of infringement of property rights of the author but not the size of the damage, that is to
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meet the demands for compensation, it is enough to show evidence that person has committed acts that are recognized as violation of authorship.

Also, such administrative penalties can be applied for violation of intellectual property can be used [3; Article 24]: 1) extraction of the object, which became an instrument or direct object of committing an administrative offence; 2) confiscation of: a) the item, which became an instrument or direct object of committing an administrative offence; b) money received as a result of an administrative offense. In other words, there is legally enforceable seizure and confiscation of the object, which became the subject of the trial (these paragraphs of the Code of Ukraine on Administrative Offences and Criminal Code of Ukraine were used by government agencies in elimination of well-known file exchanger EX.ua servers. However, after inspection and removal of a small amount of information that is protected by copyright, operation of the server was renewed but with a significant decrease in the amount of information). It can be seen from above-mentioned example that the Ukrainian legislation does not provide full protection of intellectual property rights, and does not establish clear procedures for the protection of these rights. Due to the prominent events of EX.ua, Ukrainian Internet space became more secure from misuse of international manufacturers’ programs, who are concerned about the protection of intellectual property throughout the world.

State Intellectual Property Service of Ukraine is currently engaged in improving Ukrainian legislation on the protection of intellectual property.

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SPECIFIC FEATURES OF THE CONCEPT SPHERE OF CLARICE LISPECTOR PROSE WORKS
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Conceptology is one of the most promising research fields nowadays, because via studying concepts we can find out the actual mechanisms of language creation, what is the process of selection of language means for expression of an opinion. The studying of the concept spheres of works of different authors will allow linguists to research which topics and images are iconic in the culture of a certain period, specifically in terms of linguistic culture. The study of Clarice Lispector works is of particular importance for Ukrainian philology and literature, because despite the fact that she is the writer of Ukrainian origin there are still no works in Ukrainian linguistics devoted to the analysis of her heritage. And through the study of the concept sphere of her prose works we can find out how three linguo-cultures –
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The concept sphere is actually “storage” of typologically different concepts, frames, gestalts and scripts that are combined with each other basing on certain principles, containing and describing all the knowledge acquired by society. However, it is believed that concept sphere is not the common entity for the whole society, and but it may belong to a certain sphere or topic, e.g., the concept sphere of office workers, the concept sphere of the university, the concept sphere “Culture”.

In our study we have investigated the concept sphere “Culture” in prose works of Clarice Lispector. Culture is a complex concept (which nowadays possesses more than 500 definitions), and hence the concept sphere describing this phenomenon covers a variety of concept layers depicting the cultural tradition of the nation. Within the process of modern study of literary text and language some authors consider the conceptual peculiarities of the idiostyle. The features of idiolect and idiostyle, expressed by the author, are reflected in use of stylistically colored and uncodified vocabulary, in word-building, in the development of desirable overtones of meaning and formation of new concepts at the level of the text. Therefore, in the analysis of both concept of “culture” in the Clarice Lispector prose works we have paid special attention to the selection of expressive means, syntactic structures, phrases, etc. by the author, because in this way we can define the concepts that are often found in her prose texts. The congestion of expressive means expressive and stylistic figures is untypical for Clarice Lispector works. In the English translations of her works we can observe the evident tendency to use simple sentence structures, but which differ in length, providing a narrative rhythm and fluency.

The concept sphere “culture” in the works of C.Lispector mostly corresponds the following definition: “Culture is a measure of humanity” because in her works the greatest attention is paid to the inner world of a person, the character and actions are displayed there in a way to reflect the mood and feelings of the characters. Despite the description of the inner states of mind, the descriptions of settings are also of a great importance in Clarice Lispector’s works. The most common concept systems in the concept sphere of the Clarice Lispector’s heritage are the following ones: “Woman”, “Brazilian culture” and “nature”. We can’t but mention that the concept system “Woman” has the most complex and derived structure (it includes concepts “Woman”, “Mother”, “Mistress” and “Girl”).

References:
It is typical to mishear words while listening to poetry, songs or someone`s speeches and people tend to substitute words which sound alike and make some kind of sense. It is extremely common. This phenomenon is known as a mondegreen. It is also used in literature as a stylistic device. In our study we consider different types of mondegreens and reasons why they occur.

American author Sylvia Wright was first to introduce the term "mondegreen". Mondegreens often occur in children`s speech. Trying to understand mysterious adult language, they make up nonsensial words.

Among mondegreens malapropisms, eggcorns, spoonerisms and soramimis are distinguished.

Amalapropism(or so-called "dogberryism") is the term denoting the use of an irrelevant word instead of a word that sounds similarly, and results in a meaningless,oftenamusing sentence. Forinstance,"amiabletothelaw"insteadof"amenabletothe law","hypodermicalcase"insteadof"hypotheticalcase","to ruffle the ignominy" instead of "to ruffle the equanimity" This stylistic device was widely used in novels by O`Henry.

The term "eggcorn" (sometimes called as "oronym") denotes a substitution of a word or a group of words for ones that sound similar or even identical in the speaker's dialect. The meaning of a new utterance differs from the original, but it can occur in the same context, such as "for all intensive purposes" for "for all intents and purposes", "mating name" for "maiden name".

Spoonerisms are errors in utterances or a play on words when letters or sounds are mixed in a word or phrase. For instance, "flutterby" instead of "butterly", "goys and birls" instead of "boys and girls".

The term "soramimi" denotes homophonic translation of song lyrics, in other words, interpreting lyrics in one language as similar-sounding lyrics in another language, such as "сто балерин" instead of "stumbling in", "ракамакафон" instead of "rock the microphone".

According to N.N.Efimova, all kinds of cognitive distortion mentioned above have common and different peculiarities [1]:

<table>
<thead>
<tr>
<th>Kind of cognitive distortion</th>
<th>Proximity of meaning to the sense</th>
<th>Intention of creature</th>
<th>Referring to poetry</th>
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</thead>
<tbody>
<tr>
<td>Soramimi</td>
<td>-</td>
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<tr>
<td>Eggcorns</td>
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<td>Malapropisms</td>
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<td>Spoonerisms</td>
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<tr>
<td>Mondegreens</td>
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</tbody>
</table>
Having considered such types of mondegreens as malapropisms, eggcorns, soramimi, and spoonerisms, and paid attention to their functions we must admit that this phenomenon needs a further research as it has a considerable impact on perception of utterances.

**References:**

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**PECULIARITIES OF THE TERMINOLOGY IN THE BRANCH OF ECOLOGY**
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At the present stage of civilization development when a safe environment became one of the key values concurrently with engineering, natural sciences and humanities discipline of ecology has appeared. Accordingly, environmental issues become the subject of increased attention of linguists.

Thus, the topicality of the studied topic is determined by the need of scientific understanding and systematization of modern terminology in the field of ecology.

The purpose is to analyze features of modern English terminology units within the branch of ecology.

To achieve this goal the following objective was defined:
- to identify peculiarities of the terminology in the branch of ecology, in particular to characterize the term and texts in this field.

It is instructive to note that a study of the relevant terminology contributes to more active development of this branch and more successful communication of the social group and its members. Interaction between general and special purpose languages is growing. In addition, the international relations are expanding, including cooperation in the field of ecology and consequently it is necessary to study the current terminology in that branch.

Terminology in the field of ecology is a complex and ambiguous phenomenon. It establishes a special lexical layer, which changes and dynamically develops in due course providing communication needs of experts in that branch.

Terminology of the analyzed branch represents the layer of vocabulary which includes the names of objects, actions, processes, events and persons directly related to the environment as a branch of professional occupation [1, c. 121].
Present-day ecological terminology is a complex phenomenon, since the science of ecology has been formed under the influence of various external and internal factors. Therefore lexical units are included in the terminology of ecology discipline and may be used in other sciences and areas of life.

Science and technological progress as well as globalization lead to the emergence of neologisms in the field of ecology.

Terminology as a special composition of the vocabulary is affected by the language contacts as most notably language contacts are related to the scientific sphere, politics issues, economy, ecology and more [1, c. 102].

It is important to emphasize that ecology terms are commonly used in the mass media, advertising, politics, etc., especially when it comes to events message associated with environmental programs, changes in the field of environmental law, natural disasters and others.

Exchange of knowledge and experience in the field of ecology with the experts is essential to form a common terminology that would facilitate the speed of interaction and response to environmental situation [2, c. 40].

Different types of texts concerning environmental issues have clearly defined intended recipients. Therefore, the interpreter should consider special purpose (primarily addressed to professionals in the field of ecology and related areas) and general (designed for a wide range of amateur recipients) texts on ecology separately.

Since informative function prevails in the special purpose texts on ecology, the main demand for these texts is to render the termhood [3, c. 193].

Usually terminology in the branch of ecology includes:
1) environmental terms (habitat, dew point, neritic zone);
2) environmental realities (Yellow Stone, National Park, Good Friday);
3) environmental marks (Three Male Island accident).

Ecological terms are the easiest for translation as they quickly acquire the status of international and therefore get the direct equivalent.

Most general texts on ecology have a wide range of recipients and concern actually not so much environmental issues in the narrow sense, but their economic, political, social, psychological and ethical aspects [3, c. 186].

Thus, the study of terminology in the branch of ecology is progressively claiming attention of linguists. With the development of science and technology this area quickly updates with new terms, so there are many aspects to be investigated.

Terminology as well as both special purpose and general texts on ecology is a prospective target for research in the field of translation.

References:
THE STRATEGY OF PROMOTION READING IN UKRAINE
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The traditional printed book is still relevant, it must be said that Ukraine has a distinct disparity between readers and book buyers, because the difference between these groups was 21%, as shown by research R & B Group, about 51% of Ukrainians do not read art literature at all.

The problem of reading in our country is compounded by the unstable situation in Ukraine, political and social crisis. At this stage it is necessary to pay attention to this issue and develop a strategy to promote reading among people in Ukraine. Promotional products must motivate the Ukrainians’ reading.

According to an authoritative international research PISA (Program for International Student Assessment), the ability to perceive, analyze and comprehend text at modern teenagers are underdeveloped.

Compared with research in previous years, the tendency to buy books decreased significantly, because young people use eBooks, and adults gradually adapt to electronic reading. Also, the result of the research showed that there is no such a modern national writer who is known at least by half of our population

Thus, the situation on Ukrainian publishing market, unfortunately, is not encouraging. By the protracted economic crisis, this affected the purchasing power of the Ukrainian, added political and social crisis. In such circumstances, an advance idea becomes even more difficult, and the problem of reading among Ukrainians receded into the background.

In order to sell a product to consumers, it is not enough to set a low price. The target audience must know and understand all the unique features of the product, this can be achieved through various means of sales promotion.

All this can be achieved through the development and implementation of strategies to promote and communication policy.

Target reading audience of PSAs very mixed, because it is unlimited by age group (people from ten to seventy years) by gender (men and women), social status (people of completely different professions, from ordinary workers and housewives to civil servants).

If, for example, printing will be used correctly chosen strategy of promotion, it will address the following issues:• Implement in consumer awareness of positive information about products and services from the competition. Restore reputation or improve their image;• Ensure awareness of the logo and symbols of its new services and products;• Create an image of prestige and unique services or products. Show customers the advantage of prices and quality of service or product over competitors;• Support customer loyalty to existing products or services to attract new customers;• Increase commercial effectiveness of the company to increase sales;

Promotion - is a mix of techniques of public relations, management, sociology, psychology, marketing, ethics and other related sciences. After gathering the
necessary information about their target audience, preparing a business plan and creating promotional material, the organization can safely proceed to implement the strategy of promotion, in which may include the following elements: 1) Advertising in the media; 2) Individual communication with potential visitors and buyers; 3) Activities as information sponsors events; 4) Conducting various independent actions within the advertising strategy (competitions, seminars, festivals); 5) Advertising on the exhibitions territory; 6) Creation of online projects.

Social advertising — it is a kind of a non-commercial advertising aimed at changing patterns of social behavior and to draw attention to the problems of society. Social advertising (in the US and Europe for naming traditionally used the term PSA - public service announcement), differs substantially from the public and political advertising.

That is why, it is better to use this type of advertising, because the problem of reading – it is a problem on the social level. In our opinion, the most appropriate to use such means of advertising, as handouts, promotional stickers, flashmobs and advertising in social networks. Development of advertising material and their placement in locations where our target audience is going, should improve the situation. Such advertising must be unusual, creative, attract attention, motivate and remain for long time in the memory of the audience.

References:

THE PECULIARITIES OF POLYSEMY IN MEDICAL TERMINOLOGY

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Polysemy is the process in linguistics according to which one word can have two or more meanings. Nowadays this phenomenon takes place more and more often in oral and written forms of communication, since there a steady tendency to use the items from the field of linguistics exists. In fact, the application of already existing terms in order to express another meaning is much more popular practice than creating complex and sophisticated sentences for each separate meaning, which is necessary to express. This phenomenon is in practice in specialized terminologies as well, and the sphere of medical care is not an exception. Since the medical terminology requires being specific in order to avoid serious mistakes, there is a sharp necessity to make sure that medical terms were used in their appropriate meaning.

It is worth mentioning that both common words and terms are systemic language units which system status is determined by the presence of lexical meaning.
However, contrary to the word semantics, term semantics is presented as a set of interrelated lexical meanings, which scientist O.O. Potebnya called near and distant meanings.

It is important to underline that lexical and denotative meanings not always coincide. There several variants of their correspondence:

1. Lexical meaning of the term can fully coincide with the denotative one, for instance: *cerebral accident, antiseptic, clavicula, ear lobe* etc. These terms are called correctly or orienting.

2. In case a borrowed foreign word is used as a term, but its primary meaning was lost or forgotten, lexical meaning itself can be absent, for example: *roentgenotherapy, Hippocratic face, artholithiasis*. The mentioned terms are called non-motivated or semantically neutral.

3. The absence of correspondence of lexical meaning of the term and existing denotatum can result in the difference between lexical and denotative meaning of the term or can lead to characterization of the denotatum which doesn’t exist in reality any more [1].

Consequently, it is of high importance to take into consideration the context and determine in which field the term is used. The ambiguous usage of terms can be shown on the following examples:

- *accident* (common usage) – catastrophe;
- *accident* (medicine) – complication;
- *column* (common usage) – pillar;
- *column* (medicine) – spine [2].

Moreover, the core meaning of the term of medical terminology can vary even within medicine literature. Let us analyze a typical word “inflammation”, which is a good example of polysemy. There can be no less than five various meanings of the given word depending on context where the word can occur, i.e.:

1. *Inflammation* can segregate all external agents.
2. The diameter of *inflammation* is 5 cm.
3. The *inflammation* has significantly changed its form in this case.
4. The *inflammation* appeared just during two months.
5. The current *inflammation* is rather severe.

Having found out the exact meanings of the word in each case, it is obvious that there are still semantic differences in the given sentences, even though they all belong to the specialized medical literature:

1. *Inflammation* as a specific biological function accelerating external agents segregation.
2. *Inflammation* as a certain portion of part of a body, which performs the biological function.
3. *Inflammation* as an uncommon morphology of the definite portion of a body part (morphology is the medical shapes category).
4. *Inflammation* as clinical condition including all those entities.
5. *Inflammation* as a specific diagnosis which can be applied to the medical condition [3].

Thus, it was found out that polysemy is an integral feature of English medical terminological system, which enriches its vocabulary, but in the same time can make the meaning of the word ambiguous. That is why nowadays the correct usage of medical terms involves analyzing the context and sphere where exactly the term is used. It causes the necessity to investigate semantic characteristics of terms in the sphere of medicine, taking into account even subsystems of this field of science. Only in this way it can be possible to reach the aim of communication in the spheres connected to medical care without any misunderstandings and mistakes, which can easily occur in case the peculiarities of this kind of terms are neglected.

**References**


**DATABASES ANALYSIS APPLICABLE FOR SELF SEARCH BEFORE REGISTERING TRADEMARKS**

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Search by trademarks is a mandatory phase of research where the searching process in the collections of documents, corresponding the demand, is carried out. Search by trademarks is held for the following purposes:

- check the unique character;
- collect information about competitors;
- find more information and other materials.

Search by trademarks is performed by using data retrieval systems, manually or using appropriate software. There are free online resources (databases) that can help to achieve the most effective results in a short span of time. Let’s take a look on some short descriptions.

1. *Ukraine(uipv.org)*. There is an access to a variety of databases (DB) [1] and inquiry systems (IS) on industrial property on the official website of Ukrainian patent. Search by the marks of goods and services is carried out by – DB “Marks for Goods and Services Registered in Ukraine.” Comparative advantage of this database is a tremendous amount of collected information unlike in other databases. It is caused by the fact that trade mark is considered one of the most popular intellectual property objects.

However, the disadvantage of this database is that it is unfortunately forbidden to self-search the information on applications for trademarks in Ukraine. In order to carry out the search by applications it is necessary to contact the Constituent
Company of State Enterprise “Ukrainian Institute of Industrial Property” – “Ukrainian Center of Innovations and Patent Information Services”. But this procedure is not free of charge and the price of search reaches 5000 thousand hryvnas [2].

2. **Russian Federation**([http://www.rupto.ru](http://www.rupto.ru)). The registers of trademarks and service marks, inventions, useful models and industrial designs, appellations of origin, well-known trademarks, international trademarks with indication of the Russian Federation, accessible public registers of applications for registration of trademarks, service marks and appellations of origin, applications for patents on inventions, useful models and industrial designs are opened on the Russian patent site.

Official journal of the Russian Federation “Trademarks, Service Marks and Appellations of Origin” (ISSN 2313-7460) consists of the following chapters:
- Official notification;
- Applications for trademarks and service marks;
- Applications for appellations of origin;
- Commodity Signs and service marks;
- Appellations of origin;
- Well-known in the Russian Federation trademarks;
- Notifications concerning trademarks, service marks, appellations of origin;
- Judicial decree about infringements of owners’ rights.

Quantity of publications consists of 24 issues a year. It is published 2 times per month. From 1994–2005 the Journal has been printed on paper, from 2005–2013 – on CD / DVD, from 2014 – online.

3. **World Intellectual Property Organization** ([wipo.int]) – is a global forum that deals with services and policy issues, cooperation and information in the field of intellectual property. It is a financially independent agency of the United Nations Organizations and includes 188 member states.

The main its goal is to lead the development of balanced and effective intellectual property system that creates the opportunities for innovations and creativity of the benefits for all people.

Among the databases located on the website of WIPO that concern the subject should be emphasized:

<p>| 1. “ROMARIN” (Read-Only-Memory of MadridActive Registry Information) [3] [Permanent storage device of information on the active register of Madrid] | It contains the information about all the international marks registered in the Madrid system, that currently operates in the International Register or effect of which has passed in the last six months. It also contains the data relating to the international applications and the instructions that are still in the process of examination in the International Bureau. |
| Global database of brands [4] | It facilitates search through approximately 17700000 files relating to trade marks which are... |</p>
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<th>Innovations in Science and Technology</th>
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under international protection, appellations of origin and armorial bearings, flags and other state emblems as well as full and short names and emblems of intergovernmental organizations. Global database of brands allows free and simultaneous searches of brands across multiple data collections.

Thus, analysis of the databases showed that the information and technical support which Ukraine and Russia operate unfortunately do not correspond the completeness and breadth of information that contain foreign databases. It is necessary to mention that in the analyzed databases the self-search by applications is not carried out only in Ukraine.

References:

INTELLECTUAL PROPERTY AS AN IMPORTANT PART OF MODERN ECONOMIC RELATIONS
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Under the present conditions it is important to focus on Ukraine’s economy competitiveness. This becomes important activation of innovation, because without this intension impossible to implement progressive structural changes in the economy, reinforce performance is all industrial sectors.

Only radical measures aimed at the introduction of new technical and technological solutions, modern manufacturing processes that can produce competitive goods, the economy of Ukraine will come out of protracted crisis and balanced enterprises operate in different economy sectors.

Continuous and constant innovation is necessary and natural form of existence of any state, providing her survival, growth, competitiveness in the domestic and foreign markets. Innovation is a tool to affect to the process of development in all activities of society. Without it, every economic system sooner or later doomed to failure.

Nowadays we have a society, in which the decisive element in the production of all necessary goods is technologies. To survive in the competition, you need to
produce competitive products. This can be achieved by continuously improving processes for their production. This can be impossible only through the boost of intellectual activity, that such intellectual property like patents, industrial models and designs, trade secrets and more.

To create powerful laws on protection of intellectual property rights in present we must firstly understand that all begin from the state's policy. Therefore, countries where there is no such laws, create them, and the country where the system inherited from the troubled past and don't meet the new needs, try to do them better.

Creation of a national system of intellectual property protection has a dual purpose. On the one hand, the need to legally formalize economic and moral rights of authors and owner of intellectual property, and the other - to stimulate public policy within the creative activity of citizens, promote and use the results to encourage fair trade.

Thus, the right to patent for an invention stimulates investment of money and human resources focusing on research and development. The patent boosts investment in industrial use of the invention. Patents make it possible to inform about them society and thereby stimulating the creation of new inventions and thus contribute to scientific and technical progress.

One of the main destinations of the system of protection of intellectual property is that it encourages inventive activity and stimulates creativity citizens.

The impact of inventions on economic development can be carried out on four channels:
1) information about patents facilitates transfer (transfer) technology and promotes foreign direct investment;
2) patents encourage research;
3) patents as a catalyst for new technologies and business;
4) Business accumulate patents and capitalizes them by transferring rights through licensing agreements, making the charter capital of enterprises use their own production to generate additional income.

The experience of many countries has shown that the development of national creativity has no future if the author is not guaranteed royalties for his creative work. So, copyright protection provides decent protection of the rights of publishers and performers, payment of the equitable remuneration to authors, but also the protection of copyrights, beneficial not only to authors but also the state because eliminating unfair competition, it helps to replenish the state treasury by taxes. However, this need to implement administrative infrastructure that would ensure strict compliance with copyright.

Of copyright and related rights, contributing to the cultural development of the country may have a significant economic importance for authors who have created them, and for the company or the state.

References:
TECHNOLOGIES AND INNOVATIONS IN 3D PRINTING

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It’s not a secret that 3D printing becomes more and more popular. Development of this technology has enabled a 3D printing in various fields of human activity and nowadays this technology is beginning to take a real industrial might. For example, one of the last innovations in Construction and Interiors areas was the appearance of the device that can “print” to ten houses per day. It was presented by the company WinSun from China. This device can print furniture large enough and use different color themes.

Explorer of Harvard University, Jennifer Lewis introduced printing batteries. The reason for that was to reduce energy consumption. Technology which suggested Mrs. Luis can be used in creating wirings, electrodes and antennas.

Massachusetts Institute of Technology researchers have recently created the original lightweight structures. They are printed on special 3D printers, and then come together on the principle of Lego. In this way, researchers are trying to create a full plane of a large number of small, identical to each other, created devices 3D printing.

Huge prospects of 3D printing have been able to assess the management of Rolls-Royce. This British company announced the start of the application of 3D printing for the production of aircraft engines.

In medicine, 3D printing technology has been successfully used first of all for the manufacture of bone implants, prostheses and various orthodontic appliances. Also this technology uses in aesthetic dentistry, pharmaceutics and printing human organs and tissues.

So, quite soon, we expect new revolutionary solutions and innovations in this field that can literally change our daily life.

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2. http://newtech.about.com/od/techinnovation/a/Future-Trends-In-3d-

MEANS OF COMPOSITES CREATION IN THE SPHERE OF ECONOMICS AND MANAGEMENT

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Terminological system of economics is complex including such constituents as management, financial and juridical sphere, accounting and other. Thus, taking into account that management is a constituent of the economics, we can state that these two areas share the same terminology and possess the same terminological system.

Compound terms is the structural feature of the economics terminology. The great number of compound terms in this sphere is stipulated by the general linguistic
trend toward simplification of language, at the same time preserving and expressing lexico-grammatical relations within these terms. Structurally all compounds are subdivided into the following groups: those, which are written as a one word, those, which are written with the hyphen, and those, which consist of several words.

Some scholars argue about what terms should be called compound? Therefore, such notion as a term-composite is used and includes those terms formed by means of compounding, and written together or hyphenated, as well as those, which some researchers call terms-phrases. If for the first group of composites compounding is a characteristic feature of creating new terminological units, then for the second group (terms-phrases), the expression of syntactic relations is the characteristic model of creating new units. In turn, these terms are divided into two- three- and multicomponent terms.

The most common means of term-building in the sphere of economics implies compounding and syntactical method. Multicomponent terms outnumber the single-component term. According to the structural peculiarities of compounds, they can be: compounds generated from the simple stems, parasynthetons, shortenings and lexicalized syntactical formations.

There are five productive ways of building new terms among the compounds consisting out of two components, which are represented by the following models: 1) N + N; 2) N + of + N; 3) Adj + N; 4) V + N. As we can see, noun is the obligatory constituent in 3 cases out of 4. It is obvious that the noun possess the great semantic capacity. To put it simply, we can talk about the noun, adjectival and verbal syntactical formations. According to their syntactic connections, the compounds consisting of several components may be prepositional and non-prepositional.

The most rear means of term-building in the sphere of economics is shortening. This may be caused by the occasional character of shortening which is not immediately included into the dictionaries.

References:

EMPLOYEE MOTIVATION TO HELP REALIZE ENTERPRISE ACTIVITIES
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The question of employee motivation is the major issue when the company tries to get as much benefit from their own staff as possible. In the current situation that has happened in Ukraine, the problem of motivation has gained a significant
importance so far as the society's problems could be solved by creating a proper motivational system that will encourage employees to work more efficiently.

Recently, the impact of employee motivation is becoming more popular in academic and business circles, new approaches to management are appearing. Actually, foreign and domestic scholars are unified and concentrated. Theoretical and practical reasons for the use of motivational mechanism were reflected in the works of many domestic and foreign scholars: A.M. Kolot., G.A. Dmitrenco, A.S. Afonin, T.N. Maksimenko, N.G. Rofe, E.N. Genkin, and others. The main purpose of encouraging people to work is the need to obtain funds for their own interests. Sometime later the comprehended problem becomes a conscious goal which determines the behavior of the worker, his labor activity. However, work in Ukraine today is mostly regarded only as a means of earning, it could be suggested that the need for making money will grow to a certain limit (depending on the standard of living), after which money will be used for life satisfaction. In this case, the main need may play the role of the need for achievement, creativity, etc. [1, 2].

The results achieved from the motivation models do not allow us to identify what really motivates employees to work. The study of man and his behavior at work gives not only some generalized explanation of motivation, but they even help develop motivation models in a particular workplace.

Below there are such models that are often used by different companies [3]:
- financial motivation;
- primary and secondary needs;
- internal and external compensation;
- justice;
- expectations;
- social justice.

Motivation requires to use working capacity qualitatively. The director who may interest his employees in improving their work, always succeeds in working capacity. Managers should always think about possible ways to improve the performance and motivation of workers who work with them. An important role is played by the fact that the most effective, and sometimes simple demonstration projects attract the attention of workers in the projects [2;3].

Today, due to complicated economic situation, it is quite difficult to set a high salary, and attention should be paid to material and non-material incentives, establishing flexible employee benefits, improving working conditions, for example [4]:
- determine the value of an employee to the organization;
- provide creative freedom;
- apply programs to improve work and staff rotation;
- identify flexible working hours, part-time or week, work both in the office and at home;
- provide employee discounts on products produced by the company where they work;
- loan housing, cars, etc. to co-workers.

The main non-financial means to maintain great labor activity is the creation of improved working conditions, moral encouragement and normal psychological climate.

However, not all methods of non-financial economic incentives promote the motivational effect on staff, but there are several important principles about bonuses that do not relate to the company peculiarity and state to be universal. All of them should be used by managers while applying motivation methods:

- Bonuses should not be too extended and general, as they will be seen as a normal part of salary under normal conditions.
- Bonuses should be related to a particular production contribution of workers.
- Workers should feel that bonuses depend on the extra effort, not from ordinary labor.
- Efforts of workers for earning bonuses should cover the cost of paying these bonuses [2].

To reach the target, human need can be:
- satisfied;
- partially satisfied;
- dissatisfied.

The ratio between the basic salary which was earned according to the signed employment contract and additional payments in the form of cash bonuses becomes primary important in today’s uncertainty of the market environment. In order to overcome the problems caused by worker dissatisfaction with the payment system, the proportions should be kept. Thus, in normal conditions of modern production, the amount of additional payments should be no more than half the salary. The excess of the index will lead to the loss of motivating function and additional receipts will be a part of mandatory payment.

Today, in the great competition and rapid change, any company must be prepared to adjust to the environment. However, in our country employee motivation system is being emerged with its incentives to work, according to the international experience. This is being implemented by introducing such tools of staff motivation as: employee social package, personnel training or retraining, employee participation in management.

Making the company work is possible by some influence of managing director. One of these tools is motivation. In order to move efficiently to the target, the manager must not only plan and organize work, but also make employees perform it according to standard working conditions.

References:
FLORAL METAPHOR IN THE ENGLISH LANGUAGE

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Among the artistic and literary techniques of any author, regardless of a genre he uses, there is always a metaphor as one of the most important expressive means. With the metaphor a writer can enrich the language and its stylistic emotional coloring, needed for almost any writing to fully convey the image of an object or phenomenon.

A metaphor is transference of properties and characters of the object, phenomenon or other aspects of life with the help of assimilation or differentiation (implicit comparison). Though, usually there are two objects compared, but in the metaphor there is only one. One of the types of a metaphor is a metaphorical epithet – an artistic definition, vividly describing an object or phenomenon.

One of the main functions of a metaphor is adding figurative and expressive coloring to the language, adding some bright emotional sensitive emphasis.

Another function of metaphor is nominative, i. e. language enrichment with lexical and phraseological constructions.

For a more vivid description of different phenomena, the metaphor with plants and greenery is used. These metaphors are called floral metaphors and are used for transferring the features of the nature to people’s character or behavior.

A metaphor tends to assess qualities by comparing an object or person with a plant or a part of it with negative or positive connotation. Reference to a person comparing him or her with the plant creates figurative nomination.

Many metaphors use plants for comparison of real phenomena with nature. To start with, it should be noted that the basis of similarity relations between the original word and the object of a metaphorisation is associated with both the properties of the plants that can be planted, bloom, wither, and its parts. Each of its components has certain associations in different world cultures. Thus, for example, the root, which is underground, is usually associated with support, reliability; flower - with life, beauty; leaves that yellow and may fall indicate the health of plants and seasons, etc.

Here are some common examples:

Plant:
✓ to plant a police officer on every corner – here we have the word “plant” as a verb, meaning “to put, to place something or someone”;
✓ a hothouse plant – the word “plant” is a noun, meaning a person who is sensitive, delicate, someone who needs pampering or special conditions.

Root:
✓ roots of a sea, root of a mountain – a bottom, or a lower part of anything;
✓ the root of all evil – here the word “root” means the basis, the reason, the inception;
✓ to search for one’s roots – meaning searching for one’s ancestors;
✓ **the root of the matter** – the main point, gist of the matter.

**Fruit:**
✓ **to bear fruit** – here the word “fruit” has the meaning “the results”.

**Daisy:**
✓ **as fresh as a daisy** – young, healthy and sound person;
✓ **under the daisies** – this metaphor has an opposite meaning, to be under the daisies means to be dead.

**Apple:**
✓ **apple of discord** – popular expression, meaning “the reason for a quarrel”;
✓ **the apple of one's eye** – meaning something really important and valuable.

These are just a small part of all the metaphors used in the English language.

All in all, floral metaphors play a significant part in a language. They are found in everyday, colloquial speech, giving it some certain coloring and sometimes even comic element. Some idioms are of bookish origin or of religious texts, mythology, specific historical events. Metaphors have bright expressive and stylistic marking, more distinct features and therefore are widely used in science, technology and literature from different times and epochs.

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**ORIGANIZACIONAL ASPECTS OF ADVERTISING CAMPAIGN**

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Advertising – is a motor of trade. The main function of advertising is to provide information about the product or service, and the buyer must be convinced of the need to purchase. M. Larne said: "Advertising - a way to force people to buy what they have not heard" [1].

So, the difference from the usual inform message, advertising is interested in final result. Advertising aims to increase the demand for a product or service.

Advertising cannot exist by itself. To effectively influence the buyer advertising must use the experience of other branches of knowledge: marketing, psychology, journalism, linguistics, literature, public relations and others.
Firstly, consider the concept of marketing. It is based on the idea of meeting the needs of potential customers. It was in response to the complexity of trading activity in terms of increasing the volume of output. Kotler in his book "Principles of Marketing" wrote: "Crisis «overproduction» required serious analysis of the market situation and the result of this analysis was the discovery of the principles of market mechanisms. It was found that the main feature of existing markets - priority position in relation to consumer products. The market of this type is called "seller's market". If characterize it very briefly and schematically, originally developed and manufactured goods, and then active search for its customers and intensive marketing methods "][2, p. 59].

When the market is saturated, the struggle begins for the consumer. Come into force competitors, active advertising and various forms of sales promotion. "Seller's market" - a market situation where the volume of product exceeds its sales. In this case it is necessary to create demand for goods actively.

In turn, the "buyer's market" contrary sells that requires of the consumer. Production of the product is based on studies of various market segments, queries potential buyer - companies, organizations, companies and individual groups. This time there is no need to actively create demand for goods. The consumer is already has a need for it. Manufacturer, through research, found previously unmet needs and developed a product that will satisfy them."Production and sales in a" buyer's market "are the theme of marketing activities" [2, p. 60].

Kotler assumes that "marketing somehow affects the interests of everyone, including the buyer, the seller or the average citizen. After all, these people may have goals that conflict with each other "][2, p. 65].

Kotler’s Marketing offers the following goals:
1) achieving the highest possible consumption,
2) to maximize customer satisfaction,
3) providing the widest selection
4) maximize the quality of life [2, p. 71].

We believe that we cannot exclude their alternatives. Our goal may be, for example, gain some market share; identify promising markets; creating an image of the firm measures to create a favorable attitude toward the company and so on.

One of the most prominent experts in the field of public relations S. Black says: «PR - is the art and science of achieving harmony through mutual understanding based on truth and full awareness" [3, p. 56]. Another option: «PR - is the promotion of mutual understanding and goodwill between the individual, the organization and other individuals, groups of people or society as a whole through the dissemination of explanatory material, of sharing (information) and assess public reaction" [4].

One of the classic definitions: «PR - is planned, sustained effort aimed at creating and maintaining friendly relations and mutual understanding between an organization and its public" [5].
As noted above, we can define advertising as an independent system of communication. Rather, it is part of the communication subsystem in the overall system of marketing. Other activities that are included in the system are closely linked. All these components are built together and start working "like clockwork."

Some of these activities would seem to go beyond the planning and management of advertising. "The lack of coordination of planning and implementation of promotional activities with other elements of communication subsystem, which is the" publicity "," public relations "and personal selling, as well as commodity distribution subsystem and subsystem often leads to failure of all marketing activities. It is obvious the need for efficient coordination in advertising "[6, p. 23].

Coordination in advertising is of two kinds:
• «internal» coordination, it is coordination of individual elements of this advertising program or campaign on course of action and time;
• «foreign» coordination.

The success of a marketing program depends in part on advertising. The other keys are also correct pricing, personal selling, etc. Every company has its own system of organization of marketing components. Of course, they are usually interrelated. But advertising has to know the activities of each marketing tool. The success of marketing campaigns depends on advertising coordination with all other system components.

Reference:

PROCÉDÉS D'ACTUALISATION DE L'ÉTAT ÉMOTIONNEL
"PEUR" DANS LE DISCOURS FRANÇAIS PUBLICITAIRE

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L'étude de la corrélation entre la sphère émotionnelle de la conscience humaine et le système de langue duquel l'homme se sert dans le processus nominatif et communicatif est l'une des directions centrales de la pragmatique et la linguistique modernes. Ce domaine a été abordé par des scientifiques tels que J. Bernicot, Ph. Blanchet, F. Poché, J. Moeschler, I. Shachovsky, P. Seliguey, S. Fesenko et autres.

L'actualité de cette étude est conditionnée par l'intérêt particulier de la linguistique moderne au problème de conceptualisation du monde (extérieur physique
aussi bien qu'intérieur psychologique) et au reflet d'états émotionnels de l'homme dans le langage.

**L'objectif** d'étude est de décrire l'état émotionnel "peur" et d'établir les procédés essentiels de son actualisation dans le discours français publicitaire.

**L'objet** d'étude consiste en expression de l'état émotionnel "peur" par de différents moyens dans le discours français publicitaire et en état de "peur" même dans son expression de langue.

Dans notre étude nous n'abordons que le discours publicitaire, puisque c'est lui qui reflète le plus pleinement possible les phénomènes de la vie de l'homme, ses états émotionnels et, conséquemment, l'état de peur.

L'étude comprend la considération de la peur en tant qu'unité informatique résultante de la connaissance d'un individu de l'émotion "peur". Il faut prendre en considération la nature hétérogène des connaissances de l'émotion susdite. Étant donné la complexité du phénomène d'émotion, sa saturation informatique, l'état émotionnel "peur" peut être défini comme un concept complexe dynamique de sens et structural de la conscience humaine dont la spécificité est conditionnée par l'unité d'expérience ethnoculturelle, socioculturelle et individuelle du locuteur dans une situation concrète[1, p. 40-41]. Il s'agira d'une situation où l'individu éprouve un certain état émotionnel. Outre cela, il faut noter que le moyen le plus simple de transmettre l'émotion de peur est d'engager de différentes unités de langue.

Les procédés d'expression de l'état émotionnel "peur" sont divisés en verbaux et non verbaux. Vu les particularités de cette étude nous ne considérons que ceux verbaux.

Au cours de l'étude il a été établi qu'afin d'actualiser l'état émotionnel de peur il est employé activement le lexique émotionnel et d'évaluation (des unités connotatives qui reflètent l'attitude émotionnelle et celle d'évaluation envers l'objet de nomination). Ainsi, la reproduction de la zone de l'état de peur peut avoir lieu avec le recours au lexique émotionnel, par exemple, avec des éléments parlés et/ou populaire: *J'ai tapé un sprint pour retourner au gymnase et il m'a suivie* (4). Dans cet exemple c'est par l'emploi d'une construction parlée (*taper un sprint* lieu de *courir vite*) que l'auteur met en relief la force de son émotion.

Dans le langage des gens saisis par la peur il se manifeste aussi l'évaluation d'influence potentielle de menace et apparaît un essai de reproduire la menace même: *Le félin n'est même plus "un gros félin" et ne représenterait pas de danger* (4). Accablé de peur (cela devient évident, car il utilise le mot *danger*), l'auteur analyse la situation, le risque, les conséquences possibles. Pour prouver que le mot *danger* reflète l'état émotionnel de peur au niveau sémantique nous citons sa définition: « Ce qui constitue une menace, un risque pour quelqu'un, quelque chose »[3]. L'état émotionnel de peur, ce qui est bien connu, est lié étroitement au niveau psychologique avec le sens de danger, de risque.

Dans le lexique français il existe également des procédés exprimant la peur dans son "état pur" [2, p. 87-91]. À ces moyens spécialisés de marquage émotionnel appartiennent les interjections et les constructions dont l'objectif est de transmettre les
émotions dans des situations particulières en assurant leur identification et la compacité du sens: kai! aïe! (4). Les présentes interjections sont employées lors de l'apparition d'une menace ou bien après toutes sortes d'incidents dont les conséquences restent temporairement inconnues ce qui génère à un certain degré la manifestation de peur.

Il est à indiquer qu'un énoncé décrivant l'émotion de peur subit de graves changements au niveau syntaxique. Les propositions exclamatives occupent une position de moyens efficaces d'expression d'émotions parmi les autres types communicatifs de propositions, cela étant leur objectif primordial [2, p. 92]: J'étais terrorisé! (4). Dans cet exemple l'état de peur est exprimé non seulement par des moyens lexicaux correspondants (être terrorisé - éprouver une grande peur), mais aussi par le changement d'intonation (phrase exclamative) pour plus d'exacitude et renforcement.

Bien que moins souvent, la peur est exprimée par les propositions des trois types communicatifs principaux (déclarative, interrogative, injonctive). Un haut degré de toute émotion, y compris celui de peur, et de ses formes se réalise fréquemment dans les propositions injonctives et surtout dans celles injonctives-exclamatives. Les phrases de sémantique impérative qui représentent de différents désirs comme reproduction d'expression de la volonté d'un individu émotionnellement déterminée reflètent de façon implicite une situation dangereuse, l'état de peur, ses actions concomitantes ainsi que des conséquences éventuelles des phénomènes nommés: Laisse-nous seuls! (4). Cette réplique a été prononcée dans une situation où une personne en est venue aux mains sans aucune raison visible, et maintenant ses compagnons la craignent, car ils voient du danger dans les relations avec elle, autrement dit, ils ont peur de conséquences négatives possibles pour eux. Il s'ensuit que l'émotion de peur se manifeste pleinement dans cet exemple bien qu'il ne soit pas utilisé de mots appartenant directement au champ sémantique de peur.

Conclusion. De la sorte, il a été établi et observé dans cette étude les procédés principaux et les plus répandus d'actualisation de l'état émotionnel "peur" dans le discours français publicitaire. En généralisant on peut les relater de manière suivante: verbaux/non verbaux, le lexique émotionnel et d'évaluation, des procédés exprimant la peur dans son "état pur", des changements au niveau syntaxique (phrases exclamatives), des unites neutres portant sur le champ de peur dans des situations particulières.

La perspective d'études ultérieures est de créer une plus large classification des procédés indiqués, mener une recherche plus détaillée de leurs particularités ainsi que d'établir d'autres liens entre les émotions de l'homme et son langage.

Références:
INFORMATION AS A PRODUCTION FACTOR. HOW IMPORTANT IS IT?

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Almost everyone has known that a classical economic theory includes three initial factors of production: land, capital and labor. These factors were called by Jean-Baptiste Say in the early nineteenth century. So, due to science progress land, capital and labor have been much discussed and learned at different sides in economic development. Of course, they are obsolete, I think.

But at the beginning of this century some other factors go to the foreground. These are entrepreneurship, time and information. Every specialist will agree with this. So, the problem of the data role in economy (and in our life in general) is urgent now. A few years ago, Eric Schmidt (from Google Company) cautioned about preferences and dangers this new type of production factors represents. “People aren’t ready for the technology revolution that’s going to happen to them,” said Eric Schmidt.

Today every successful company, organization or enterprise can’t work without trustworthy information about new technologies, consumer’s behavior and mind, competitors and others. If company has necessary and effective information, it has an accurate production plan and suitable profit.

Many authors and researchers have contended: information is used as strategic tools. Benjamin Disraeli said: “As a rule, the most successful is one who owns the best information”. For example, as evidence of the advantages for strategic utilizing of data, Wiseman and MacMillan confirm that information will become a real trump in business and world economic competition because of the scientific progress and informatization.

Lots of researches have shown the need for reliable data is growing more and more, especially during the last few years. Information has become an important economic, social and political resource. So now a number of companies, organizations and systems that collect process and transmit information is increasing. These organizations are: automated control systems, information technology centers, TV, radio and others.

We can see that today no one can do without computers and other advanced technology products. Contemporary people must know how to use computers, computer programs and technologies.

Today information is a system of collection, processing and systematization of various people’s knowledge and data to use it in different spheres of life, especially in economy.

Information as a factor of production, according to experts, characterized by such indicators: content, speed, diversity and truthfulness.

Content: it is very important for every kind of production that the information must have no “rubbish” and be complete.
Speed: this is the speed at which information must be delivered, navigated and processed to keep competitiveness.

Diversity: the more aspects of problem are known and learned, the more correct decision will be.

Truthfulness: the information correctness helps be sure in reliability of calculations and decisions.

So, the smart economist or entrepreneur should know:

− how to use this knowledge, as new ways to obtain and use information is the key to success;
− the information revolution is a conclusive factor of the development not only in economy but also the society as a whole;
− in such circumstances, those who have not stood on the way of informatization and reforming the economy are doomed to lag and depression.

References:

DESCRIPTION OF CONTRACTIONS IN MODERN ENGLISH

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The mechanism of word contraction was used even when there was a so-called phonetic record; in some ways it was very common in early literacy, where just initial letters referred to words in some specific context [2: 78].

First example of contraction of the word is found in English texts. At first they were graphical, just a part of them was lexicalized, because simplification of complex units is inevitable. The reading of graphic contractions using the spelling of a letter is one way to first lexical contractions in English. The processes of abbreviation reflect the logic of the specific language which seeks to keep the simplicity of expressions as well as significant facts in order to communicate.

The differences between graphical abbreviation and lexical abbreviations must be taken into account. Lexical contractions can be used both in speaking and in writing, while the graphical contractions are present only in written communication, in speaking they are replaced with the complete word or word combination, e.g. govt (government); very common feature is graphical reduction of week days (Sun – Sunday), months (Feb – February), American states (Alas. – Alaska), addressing
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(Mr., Ms.), military rangs (Col.), academic degrees (BA), measurements of time, length (min – minute, in – inch) etc [4: 12].

Graphical reduction is widely spread in Internet communication: AFAIK – as far as I know, IMHO – in my humble opinion; journalists used it to save paper for the headlines: CND – the Campaign for Nuclear Disarmament, FCPA – Foreign Corrupt Practices Act.

Lexical contractions are divided into 3 main types: abbreviation, clipping and blending.

Abbreviation is the type of word creation when first letters or parts of components of phrase are used. There are several types of it: alphabetical abbreviation, initialism, which is read as the sequence of first letters [1] (MTV – Music Television, EU – European Union, VCR – video-cassette recorder); acronym, acronymic abbreviation – sequence of sounds marked by letter components as it is a common word (UNICEF – United Nations Children's Emergency Fund); homoacronym – acronyms, that coincide with common English words, sometimes semantically bound with the object, person or thing, what name is being contracted (ASH – Action on Smoking and Health).

Also anacronyms should be mentioned. Only few people remember what the letters in these words mean (radar – radio detecting and ranging). Such innovative method of new speech units’ creation as phonologic abbreviation attracts attention (ICU – I See You, ICQ – I Seek You).

Clipping/curtailment/truncation is the process and its result of reduction of 1 or more word syllables. Some scholars think that such contractions were created as terms of specific groups of people. For example such words as exam(ination), lab(oratory) were created in students’ slang, spec(ulation), tick(et) – in communication of workers of Stock Exchange, vet(erinarian), cap(tain) – in army slang.

Different lexical components of special word-building structure were added in the XX century to English and especially its American variant, displaying numerous discoveries as well as inventions in science, technology, radio, television, physics, aerospace, chemistry, biology, linguistics, lexical units replenished special word creative building. They are created with the help of blend/blending/telescoped words/portmanteau words/portmanteau/fusion/telescoping/contamination.

For some period of time, some linguists named L.Kerrol the creator of telescoped words. He widely used so-called portmanteau words in his fantastic tales. According to structural types telescoped words fall into some categories. Full telescoped words are built by two or more truncated stems in the one word: tenique < ten(sion) + (fat)igue. The next group is partly telescoped words: a blend of the first component in its full version to the end of the second component: airbrasive < air + (a)brasive; a blend of the beginning of the first component with the full form of the second one: adenovirus < aden(oid) + o + virus. The last group is built by the words which specific feature is the presence of usual patterns of sound at the junction of parts which are combined: aerobat < aero + (ac)robat [3: 47].
The mechanisms of word contraction play a leading role in the shaping and formation of words. Sometimes contraction is one and only mechanism of word creation, that operates in conjunction with the mechanisms of stem composition [5: 190].

References:

MEDIA COVERAGES OPTIMIZATION FOR TV COMMERCIALS

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Every commercial advertisement has its own media strategy and coverage strategy, which gave general view of forecast percentage of people, who will see commercial on TV with some channels split, ratings weights for each week of placement and using PIBs (placing advertisement on premium positions).

But usually, advertisers don’t change their target audience for placement to increase from weeks to week for better coverage reaching.

This research is based on real work experience and research databases interpretation of the biggest research companies in Ukraine during placement of different brands on Ukrainian national TV channels and can help TV Byers and Media Planners in more efficient planning and reaching one of the main Key Performance Indicators (KPIs) for each TV advertising campaign. This work is about advertising campaign coverage optimization tools.

Example of using PIBs strategy for coverage and budget optimization of advertising campaign:

Example of using dynamic target audience strategy for coverage and budget optimization of advertising campaign:
History shows that political systems have certain features that allow them to appear and disappear. Rapid development of technologies makes us feel confident that in the future states can start working anew in the way we haven’t even imagined yet. So we would like to offer some theoretical types of state order which may seem strange, scaring, hopeful, but might become a reality.

The first to be presented is one country for the whole planet, so called global democracy. This state rule form is not a new one but now it has become overblown to enormous extent. The core framework of global democracy is a single country in the world which keeps to liberal, democratic rules. A lot of scientists think this scenario is possible, eventually; there are many worldwide initiatives and organizations which perform and are above some governments. Economic and cultural globalization is

References:

THE STATE OF TOMORROW: SUPER COMPUTERS, GLOBAL DEMOCRACY AND CYBEROCRACY

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well under way; just one small thing is lacking which is political globalization. Moreover, universal parliament is no more a dream. From history we see that people in general tend to disappearance of borders (remember association of China in times of Qin Dynasty, emergence of the USA or European Union). To unite people into one country only one problem is needed, it might be global warming.

The second type is autocracy of artificial intelligence where computer rules the world. If people manage to design a super powerful artificial intelligence, for instance, inside a computer it may happen that it will set a new world order, which it will control. It is possible to do that public or privately: using armies of robots, controlling human brains (with the use of information in particular) or simply threatening to destroy humanity. On the one hand the power of AI is one of the popular scenarios to destroy the universe, on the other hand, a super computer may turn “human”, solve problems people couldn’t have solved themselves, coordinate people and direct them along a new way of development we wouldn’t have chosen ourselves.

The next comes demarchy which refers to a democracy on the principle of the lottery. It is a state where deputies (people making political decisions on the behalf of the whole country population) are chosen at random, by means of lottery. The lot can fall upon everyone (like trial jury in the USA) and they will have to work as politicians for certain time. The bottom line is that ordinary people will serve common interests not their own, which can prevent and decrease corruption or political pressure.

Now we would like to focus on cyberocracy. Cyberocracy is a form of the state rule based on the effective use of information and built according to the principle that every citizen has an access to a network that gives him a lot of advantages. A network is fast access to information, instantaneous financial operations and combination of extraordinary freedom with the extraordinary degree of control. Users get huge amount of bonuses (cheap connection with relatives and friends, news, rapid payments for services, access to information every time, everywhere). What is more important the roles of these users are assumed by both citizens and organizations, including governmental.

Fundamental feature of cyberocracy is an instantaneous important information transfer from a source of problem to the people that can decide the problem. It will come true by means of the computer programs able to recognize and sort information. For example, if there is a fire somewhere, firefighters get to know about it instantly, etc. People at cyberocracy accept the minimum participating in state management and are responsible only for the most important decisions and deal with the most unusual problems.

The beginning of such system is modern centralized databases and governmental networks. An instantaneous exchange gives economic advantages information due to a greater operationability and less of errors.

Cyberocracy will substitute existing government. Everybody has a vote not simply during elections but at approving every bill. There isn’t parliament any more,
there are no "servants of people", there are only people and there is the system of votes counting.

In general, cyberocracy is traditional bureaucracy vice versa. Id est maximally rapid, comfortable and logical system of cooperation of man and state, with the human factor taken to the minimum.

References:

THE STUDY OF METAPHOR, ITS VARIETY AND FUNCTIONS IN THE MODERN ENGLISH POLITICAL TEXTS

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The already existing studies of metaphor provide just a common view of this phenomenon in the language. It should be noted that in the traditional approach of ancient rhetoric established by Aristotle and further developed by philosophers of the age of Enlightenment J.J. Rousseau and G. Hegel metaphor is described only as a stylistic device or a figure of speech that helps to develop a figurative meaning of lexical unit and enlarges the vocabulary of a certain language. Studies of the metaphor became mostly traditional for the following spheres of knowledge: philosophy, logic, psychology, psychoanalysis, sociology etc.

Notwithstanding such an abundant variety of knowledge branches concerned with the nature of metaphor, the cognitive linguistics provides the most productive way of description and specification of metaphor and its peculiarities. Among the foreign linguists the most substantial contributions into research were made by American philologists: G. Lakoff, M. Johnson, M. Black and Russian linguists: A. P. Chudinov, E.V. Budaev, O.O. Oparina, V.N.Teliia etc. From the cognitive theory viewpoint metaphor is depicted not only as the figurative meaning of an already existing word, but also as the tool of cognition, structuring and conversion of the outward reality. Moreover, it has been found out that metaphor usage helps to grasp the meaning of difficult and abstract concepts and ideas in a more regular and habitual terms.

Nevertheless, taking into account comprehensive and in-depth researches of the metaphor, this occurrence has no universal and complete definition. Moreover, all
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studies, while investigating various aspects of metaphor offer not only different classifications, but also functional characteristics which may be acquired and performed in the language by it. For these very reasons the metaphor ought to be investigated more thoroughly and deeply.

The forthcoming issue is the application of metaphor in everyday life. Researches concerning the use of metaphor in the political texts became an important aspect in the studies of political language and political life in general. As a result, another essential point of investigation is the theory of political metaphor which plays one of the most important roles in the political communication, speeches, election campaigns, public speaking and statements.

Persuasive power is one of political metaphor distinctive features which is used in the process of convincing voters, followers and supporters of one or another political party or figure. It is also important to note that political metaphor is not only a tool that makes speech bright and catchy, but also serves as means of controlling the public mood and obtrusion of one’s own thoughts and beliefs.

Considering the aforementioned ideas, it should be stated that metaphor is not only a complex language phenomenon but also a mental one that has observable contradictions on its nature; furthermore, metaphor is useful in the process of recognition and understanding difficult political events and processes and filling in the gaps in one’s perception.

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LEXICAL AND STYLISTIC FEATURES OF ENGLISH POETRY
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English Literature is a powerful layer of world literature. Science fiction language involves the selection of a set of labeled cells in the poetic text work and study of those bonds, which are established between linguistic units, in order to identify relevant characteristics of the poetry.

Features of use of lexical units completely reveal only in a complete work context. Some words experience sharp semantic shift which is prepared by a microcontext and a macrocontext, get unusual essence and become important artistic and figurative elements of ideological and esthetic structure of poetic work. Researches of language are provided with allocation of a set of the marked elements
in the text of poetic work and studying of those connections, which are established between language units, relevant for detection of identificational characteristics of the poetry.

Emotional imagery and poetic works are created with the help of lexical and stylistic devices, particularly notable is the use of synonyms and antonyms. According to scientists, the main purpose of ideographic synonyms in language is to find a means of precise expression in each case of the language use.

In addition to the use of synonyms, antonyms are widespread in poetry as well. Antonyms are words that are opposite in meaning. Set groups of words that have partially or completely figurative meaning are called phraseological units.

It should be noted that the stylistic means (tracks), unlike the means of expression, are not a linguistic phenomenon. They are formed in speech and most of them usually do not exist out of context. According to the principles of formation, stylistic tools are divided into three types: phonetic, lexical-semantic and syntactic.

Thus, modern English poetic language is very versatile, and for better understanding of the text it demands further studying and exploring.

References:

THE USAGE OF STYLISTIC DEVICES IN POLITICAL DISCOURSE

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The topic represents great importance to linguistics due to a shortage of studies on political discourse. Political discourse is a public speech associated with the sphere of political communication. One of the genres of this type of speech is a political speech. Political speech is an articulated text of publicistic style that highlights political problems. It can have either purely informative or agitational character. The purpose of political discourse is to influence the public consciousness and struggle for power.

Currently the analysis of political discourse is of importance to linguistics. The term “discourse” has many interpretations. For example, F. Batsevych [1, 138] identifies discourse as a set of speech and thought related actions of communicants which are bound to cognition, comprehension and representation of the world by the speaker to a listener (recipient). But it has to be emphasized, that discourse as a special language subsystem has its own specific functions, thesaurus and communicative impact. When discovering a political discourse it is necessary to take into account some extralinguistic aspects, as communication conditions and situation, target audience etc. Regarding the selection of material for language studies in political linguistics, its sources include core, periphery and marginal zone.
There are several stylistic devices often used in political speeches such as metaphors, parallelisms and anaphors; and also some lexical means as borrowings, neologisms, clichés. The most common in political speeches is a metaphor. A metaphor is a kind of trope, the main feature of which is transferring properties of one object to another based on their similarity. This feature enhances imagery and expressiveness of speech. Examples of metaphors: “We can lead this country in a direction of hope”, “seared in the flames of withering injustice”, “a beautiful symphony of brotherhood”. Also politicians tend to combine several stylistic means which enhance the communicative effect on the audience.

Another stylistic means that provide political speech with additional expressiveness is allusion. Allusion is a reference to the historical, mythological or well-known facts. Basically allusion is used in belle letter style, but also we may find it in political speech. O. Yemets [2, 138] brings the attention to an allusion in the speech of Martin Luther King to the declaration of liberation from slavery, signed by Abraham Lincoln 100 years ago: “But one hundred years later, the Negro still is not free”. Obama draws a parallel between extremists and nuclear weapons, putting emphasize on their destructive power and the threat they pose to society: “When a new flu infects one human being, all are at risk. When one nation pursues a nuclear weapon, the risk of nuclear attack rises for all nations. When violent extremists operate in one stretch of mountains, people are endangered across an ocean. And when innocents in Bosnia and Darfur are slaughtered, that is a stain on our collective conscience “. Effective means of influence is opposition, specifically: categorial opposition “good” – “evil”. K. Repina [3] points out that politicians in their speeches appeal to religion, folklore, etc., and turn to the physiological side of existence, which manifests itself in opposition to corporal and spiritual, higher and lower, and so on. In confirmation of this view we cite Barack Obama using a parallelism to emphasize the positive and negative aspects of TV and the Internet and trade: “The Internet and television can bring knowledge and information, but also offensive sexuality and mindless violence. Trade can bring new wealth and opportunities, but also huge disruptions and changing communities”.

Information acquisition may have both intellectual and emotional character. Hence politicians have to be able to reason their case in a cohesive way and also to bring recipient’s emotions. Using specific stylistic devices politician can either influence recipient’s political opinion or evoke corresponding emotions. It is fair to say that the more vivid the speech is, the more memorable it becomes.

References:
THE DEVELOPMENT OF PRINTING AND VERTISING AND COMPAIGN MATERIALS FOR ALL-UKRAINIAN ASSOCIATION «SVOBODA»

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Recently, much interest has increased among ordinary voters in political processes. The events of the last year and today that change the future of our country, forcing politicians increasingly use technology policy in order to convince the electorate in their own superiority over competitors. Political advertising techniques are supervised not only political scientists and policy experts, but also ordinary citizens.

At the present stage of political material printed become one of the most popular promotional products. This can be explained by the relative deshevistyu and influence. It is this type of advertising makes a wide range of effects on voters. Therefore, it is taken into account when choosing a candidate command channel distribution of advertising messages as a means to influence the electorate.

It is this gap has caused the downgrade in "Svoboda" that when planning an advertising campaign activities used poor informing the public through printed promotional materials.

The study of the problem involved both foreign and domestic scholars. Thus, in psychology, sociology, philosophy is considered the essence of manipulation of human behavior (labor Herbert Marcuse, A. Meyer, H. Ortega y Gasset, G. Franke, G. Shishkov, Karl Jaspers,). In turn, meaningful theoretical framework established American Advertising Science (F. Dzhefkins, Kotler, D. Ogilvie, William Wales) and domestic (Lukyanets T., F. Pankratov, E. Romat) scientists. It should also be noted that some aspects of Soviet literature in the psychological impact of electoral technologies covered in the works of Bebik, A. Bidenko, M. Vari, N. Voitovych, Dubko L., M. Lisowski, A. Nalotova, G. and Pocheptsov others [1].

The aim of the study is: a study using the printing features of advertising campaign materials for All-Ukrainian Association «Svoboda» on experience the 2012 year's parliamentary elections, as well as determining the most common manipulative technologies and their impact on the effectiveness of electoral choice.

There are many kinds of political ads that have their advantages and disadvantages, such as commercials on television and the Internet, radio, articles in magazines and newspapers, outdoor advertising, and others. However, the ratio of "cost-benefit" clearly wins promotional printing products. It is spread via mailing, posting on the streets and personal gear.

Now in political advertising, especially in its printed form, used slogans that show the main political policies or political party, in the form of address public attention sometimes with a picture of the candidate and party symbols. Can draw attention due to the correct layout and image quality print background colors and large, sometimes provocative slogan.
It is extremely important that these strategies and tactics of the election campaign of the party or the candidate's examine the political situation in society.

We were able to identify the main features of the environment campaign 2012. After the election in 2010 to the post of President of Ukraine Viktor Yanukovych, the mass realignment of the political elite, top representatives of the state apparatus. During this period, a change of rules in the policy. In addition to new appointments began using the Constitutional Court, the prosecutor's office and parliament.

The electorate complained about changes in the political life of the country, as a society growing protests.

Political campaign activities of the election process in 2012 was carried out in traditional forms of advertising on radio and television, events (concerts, festivals etc.), location "fashion" materials in the media that showed signs of hidden political advertising.

New channel for campaigning in 2012 were internet, social networking. Some candidates did not just create websites in the election campaign, but also recorded in social networks that helped to expand the boundaries of interaction with the electorate.

For in "Freedom" is the main result of the parliamentary election campaign in 2012 was the rapid growth of high voter support, which allowed the party to achieve its goal - to get to the Ukrainian parliament, but we can say that no political party has used all its possibilities and introduced a limited print campaign.

We propose to use patriotic enthusiasm Ukrainian society and put this basis. The most important thing is to bring it to potential voters by effectively developing and distributing among voters.

Development style campaign materials and creating effective slogans is a very important factor in creating a campaign party. "Svoboda" logo chosen as recycled trident (with raised hand with three fingers up). The main colors were chosen yellow and blue, which are the colors of the Ukrainian flag. Note that this selection is very important today, because the current Ukrainian expressing patriotism and often use Ukrainian symbols. So change the logo and kolorystyk not necessary, and that in "Freedom" used this symbolism is much still play them only benefit.

"For freedom to the end" - a slogan that will primarily during the upcoming parliamentary elections. As already noted, the advertising will be divided by party lines. For a reminder of the victory over the Ukrainian regime at the Independence Square will be advertising with the slogan - "together for the future", "We do not break" and "Through the darkness into the light." To reduce the radical parties and increasing electoral support developed a slogan: "Strength in Unity". To support the Ukrainian military - "honor and dignity above all else." To attract a young audience - "Making decent future." To show that the party is - "No promises, but action." And to show that no party oligarchs, it does not lobby someone's interests - "Money - the people."
We have developed the printing of advertising and propaganda campaign for "Svoboda": political poster, postcard political, political portrait brochure.

The main principles of advertising in "Svoboda", in our view, should be:

1. The activities of the party during the revolution on Maidan
2. Work in Parliament Ukraine
3. Key in eastern Ukraine
4. Opposition to Russian aggression
5. Roztlumachennya difference between nationalism and fascism

Scientific novelty is to develop strategies of advertising and campaigning for in "Freedom" on their own opinions and observations. The practical relevance of the diploma project is the ability to use the proposed strategy of political advertising in "Svoboda" at the next parliamentary elections in Ukraine.

References:

NEGATION AT DIFFERENT LANGUAGE LEVELS IN ENGLISH

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Numerous studies on linguistic category of negation show the variety of views on the nature of the opposition which plays a significant role not only at all levels of linguistic structure, but also in the process of communication while it is impossible without negative statements.

Negation is lexico-grammatical category which has the meaning of absence of connection between certain objects of reality. As linguistic universal negation is expressed at different levels: morphological, lexical, syntactic and grammatical. The idea of language level organization was recognized in the middle of 20th century in the work of J.Trager and G.Smith “An Outline of English Structure”. Language levels are “language subsystems which are characterized with the certain set of relatively homogeneous units and rules which regulate their clustering into different classes and their use” [1]. Language does not form levels in the process of its development but is conventionally subdivided into them.

From the formal point of view negation may be expressed by negative words (no), negative prefixes (un-known), negative forms of certain parts of speech: verb (don’t want), pronoun (nobody). Negation also may be formally unexpressed component of the word meaning (to deny).

Morphological expressive means of negation in English are frequent. There are 16 negative affixes in English: 1 negative suffix (-less) and 15 negative prefixes (un-,
dis-, di-, mis-, de-, non-, be-, counter-, a-, under-, ill-, mal-, pre-, ter-, ex-). All of them are word-building, there is no form-building affixes [2].

The most productive affixes are -less, un-, in-, non-, anti-, dis-. Prefix in-, as a rule, coins negative adjectives and nouns from corresponding adjective stems (artistic → inartistic=tasteless) and seldom verbs from verbal stems. Prefix dis- forms verbs both from verbs and nouns/adjectives (disable, disapprove) [3]. Prefix un- is the only originally English prefix which stays a productive word-building element during all time of language development (wealthy → unwealthy, grateful → ungrateful).

Suffixal means of negative semantic expression is characteristic just for English. Negative meaning of suffix -less is “lack of what is stated in the motivating stem” (regardless – незалежно). Besides -less there is also used suffix -free for expression absence or shortage of something (homeless, sugar-free).

Generally, it may be stated that morphological means of negation are closely connected to lexical level since separately morphemes do not carry sense load but in combination with the stem form new negative lexical meaning.

Previously scientists just opportunely mentioned the ability of lexically expressed negation, but today it is qualified as quite widespread and productive means of negation. As lexical units realize negation not separately but as certain grammatical component of the sentence, I.Y. Kharitonova thinks they are lexico-grammatical indices of negation [4].

The main means of negation expression is pronouns (nobody, nothing). The other highly productive means of negative action expression is usage of adverb never before verbs. Adverbs realize such individual semes: “wrong accomplishment of the action”, “objection to place of action”, “involuntary or illegal action”. Attention should be paid to peculiarities of adverb hardly, which contains in its meaning negative semantics but require absence of another negative component: I am afraid you will hardly understand it. Perhaps you will hardly believe it.

Lexico-grammatical means of negation is often called implicit as they are lack of special formant with negative meaning. Nevertheless it is impossible to agree with such purely formal approach since lexical units directly render negative meaning. The speaker clearly correlates certain lexemes with specific negative content: forbidden – not allowed, absent – not present. Clear and successive correlation of lexico-grammatical negation with grammatical independently from the situation in speech gives grounds to consider it explicit but specific means of negation. Still, lexical units mainly render not just negation but objection to something specific: objection to presence (to vanish, missing), objection to similarity (to differ, other), objection to reality (ephemeral, imaginary). Negation is only a part of semantic structure of lexical units. So, on the one hand, lexical resources of the negation simplify communication as they give an opportunity to convey certain information with negation in complex and, on the other hand, this negation is functionally limited by the frames of certain content structure.

Syntactic aspect of negation problems always was the main in research practice and it often leads to statements that negation is a category characteristic of sentence
only. For example, V.V. Lebedev offers an opinion that “minimal language unit in which negation may function is predicative construction”. Such a position reflects narrower understanding of this language phenomenon and do not coordinate with the facts of non-predicative negative language forms existence.

At present particle is considered in linguistics as one of the most productive types of grammatical realization of negation [5]. In English particle not together with the usage of negative word no is one of the main means of negative semantic expression. At the same time there exists another point of view on this unit of negation. In particular, Y.S. Paducheva refers not to so-called “negative words”. V.V. Yukht shares this idea and notes that particle not may act as predicative negator (did not), as negative particle (not him) and, as mentioned before, as word-building morpheme (not-being, not-self) [6].

Though, traditionally negative particle not is referred to grammatical means of negation expression as it take parts in formation of negative forms of auxiliary and main verbs. At the same time, in English particle not is the means of negation realization on the syntactic level. It can stand in different position to the verb and give it negative meaning. There are also entire negative constructions: neither of us, to have nothing to do with.

Consequently, comparing functional peculiarities, semantics and combinability of different levels units, we can state on their affinity in negation expression. The further research of category of negation looks perspective for the detection of negative markers potential for realization of negation both on the speech and language levels, for development of implicit negation problems and opening of negation functions in the structural organization of the offer.

References:

SPEECH ACTS OF PROHIBITION AND PERMISSION. THE WAYS OF THEIR EXPRESSION.

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In recent years the study of colloquial speech aspects is highly developed but however needs more concern. Linguists have begun researching processes that were out of their field, for example, the speakers’ intention, their verbal interaction, qualities specific for certain conversational situation.

The topicality of the research is to determine specific features of the speech acts of permission and prohibition, their direct / indirect, implicit / explicit ways of
expressing, though nowadays there are many works dedicated to the study of the directive speech acts but any of them has full range of information concerning these acts.

The appearance of such phenomenon as speech act makes the communicative theory change the focus of its study from the sentence to speech act because the sentence has less broad limits of meanings.

Firstly we have to determine what the speech act is and the way of its functioning in speech acts theory.

J. Ostin studied speech acts but the focus of his research was on the fact that this phenomenon isn’t just an instrument to describe action, but it determines and causes it [1].

In scopes of speech act theory, the main idea of which is that communication is not limited to the usage of descriptive units but also is characterized with performative sentences that denote action and cause it, it was considered three sides if the speech acts, particularly locutionary, illocutionary and perlocutionary. Due to this they can be learnt taking into account their constituents, purpose and the ways of expressing, and the influence of the speech on the audience.

According to the classification made by O. Belyaeva, the speech acts of prohibition and permission belong to the directive prescriptive speech acts [2]. It means that the position of the speaker is of high priority and the purpose of his/her speech is to obligate the addressee to perform the action.

The main explicit lexical way of expressing prohibition is the usage of performative verbs with the meaning of prohibition, veto, forbiddance.

Ex.: I forbid you to read my diary.

The verb “let” is also of common use.

The combination of auxiliary verb and the particle “not” is one of the grammatical peculiarities of the explicit prohibition speech acts.

Implicitly direct speech acts of prohibition are expressed with modal verbs combined in some cases with particle “not”.

Ex.: You cannot play football in the street (i.e. you have no right).

Sometimes even the interrogatory form is used to be more polite.

Ex.: Must you make so much noise? = Stop making so much noise.

Indirect prohibition speech acts could be presented as conditional sentences:

Ex.: I wouldn’t say it if I were you.

Also the sentences with the meaning of advice, proposal are used to prevent somebody’s action.

Ex.: It’s silly to stay all night with that wet bandage on.

Explicit direct permission speech acts are also lexically expressed with performative verbs with the meaning of permission, allowance.

Ex.: Will you permit (allow) me to use your bicycle?

Implicit expression has similar form to the prohibition acts, it is formed by modal verbs.

Ex.: You may use my phone.
Indirect speech acts of permission are expressed in the form of questions but also using modal verbs. They are very similar to asking or proposal, but there are some instances of provocative questions.

Ex.: May I go?

So, direct and indirect speech acts of prohibition and permission are very similar by the way of their expression, since most of the meaning they convey with grammatical categories. Also interrogative sentences and impersonal constructions are of common use.

We found that the expression of speech acts is really identical in many respects. Considering the direct speech acts of permission and prohibition, they are explicitly expressed with performative-words (verbs and their derivatives).

From the grammatical point of view passive constructions are quite often applicable phenomenon, as well as impersonal sentence. Modal structures are also very typical to such constructions.

With regard to indirect speech acts we can follow the trend of frequent usage of interrogative forms for transferring of indirect illocutionary values. Also characteristic is the use of idioms, clichés.

In fact this subject needs more linguists’ concern, especially regarding the phenomenon of indirect speech acts and their expression while there are many sophisticated moments when trying to find out the intention of speech act taking into account its expression instruments.

References:

ORIGIN OF PHRASEOLOGICAL UNITS
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Phraseological units play an important role in each language. Their specific structure attracts many modern scientists. Fixed phrases are part of the culture and we need to know their structure and semantics, because without this knowledge it is very difficult to understand the mentality of native speakers. Thus, the topicality of the research is caused by the need of profound study of such important linguistic phenomenon as phraseological unit. The purpose is to analyze the origin and cultural characteristics of English idioms.

Many linguists such as M. Lomonosov, A. Potebnya, A. Shakhmatov were interested in studying of phraseological units. They thoroughly investigated the syntactic nature of phrases and highlighted stylistic and semantic features of stable words [2, p.161].
Phraseology of English and Ukrainian languages evolved over centuries due to contacts of one nation with other nations and their cultures. There are several sources of idioms:

The main source of creation and updating of idioms is a living grass-roots language, which gives popular expressions, proverbs, sayings and jokes. Such statements related to rituals, customs, way of life and the nature of people: all roads lead to Rome, the seven deadly sins [1, c.95].

A lot of idioms are professional speech expressions: many a little makes a mickle, measure thrice and cut once [4, c.328].

In Ukrainian and English there are also idioms of ancient origin: the sword of Damocles, the Augean stables, Golden Fleece, Achilles' heel, Olympian calm, Gardens of Babylon.

Idioms from the Bible: Adam and Eve, the prodigal son, the end of the world, the prodigal son, the road to hell is paved with good intentions [3, c.152].

A large number of phraseological units were borrowed from European languages at a later time. These are expressions from world-famous fiction of H. C. Andersen, Galileo, Socrates, Descartes, etc.

Winged phrases are a figurative sayings, quotations, aphorisms, emerged from famous literary sources and begin to live their separate lives, were accumulated, concise expressions of important ideas and thoughts: to be or not to be [5, c.75].

Proverb is an established expression of informative character, which expresses mainly moral and ethical idea: All good things come to an end; Better an egg today than a hen tomorrow.

Proverbs have rhymed form and are consisted of two parts. The content of the second part is the opposition to the first part or conclusion: Iron hand in a velvet glove; Wine is in, truth is out [5, c.83].

The saying is an established expression of generalized content, which often has a direct meaning to a particular life situation: Self comes first.

The sayings differ from proverbs because they do not have conclusions, moral (the second part of the phrase), they only imply the result.

Despite general fund, Ukrainian and English sayings were formed in different historical conditions, reflecting socio-economic structure and conditions, which are not identical in two nations. The difference concerns the image used and subject of texts, where phraseological units were applied.

An essential feature of English proverbs is their folk character, by which we mean unidentified authorship, use for a long period by broad masses at large territory - in the UK, US and other English-speaking countries.

Another important condition in the idioms distinction lies in the ability to analyze language features. For example, the conflict between the figurative and literal meaning of the text is often used by the author to compare some imaginative, aesthetic, emotional, evaluative and other associations or to create a humorous effect [3, c.131]. In addition, many phraseological units are fixed in separate social and cultural layers of society and serve as the basis of indirect presence of a stratum in the
text. Idiom have some stylistic coloring, it may be elements of high, low or neutral style, or other professional jargons.

The presence of figurative phraseology provides brightness and flexibility. Such phraseological units conclude a wealth of expressive and stylistic nuances that make language more vivid and emotional. Translation of figured phraseology causes considerable difficulties for a translator because often there is a risk to give the incorrect meaning of the idiom [6, c.105].

So, phraseological units have specific syntactic structure and such features as stability, expressiveness, didacticism, aphoristic and folk character. All these features significantly distinguish phraseological units (proverbs, sayings, winged phrases, phraseological units of ancient origin, etc.) from other language units. While translating fixed phrases, the translator should not forget about differences in culture and traditions of both languages. Fiction literature is characterized by frequent use of different stylistic devices, especially idiomatic expressions, which make fiction works more interesting and stylistically beautiful.

References:

COMPARATIVE EXPRESSIONS WITH AN ANIMALISTIC COMPONENT
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A representation of animals in the phraseological units is connected with a tradition of pre-Christian times, when people considered themselves to be part of the nature personifying it and gave the representatives of fauna features peculiar to humans. Hence, the phraseological units, which include the names of animals and reflect certain human features appeared. The research topicality is based on the study of English phraseological units with animalistic component, their structural and semantic peculiarities.

Such researchers as O. Kunin, S. Akhmanova, V. Vinogradov, J. Lyasota and I. Pokrovskaya devoted their works to the study of English phraseological units, including those with animalistic component. Nevertheless, we can observe only fragmentary description of certain groups of English phraseological units with animalistic component at the present stage of their development.

Among significantly large group of phraseological units with animalistic component comparative expressions with as...as in its structure, which are either semantically correlative with adjectives or specify (usually intensify) their meaning should be mentioned. These phraseological units are called comparatives. They are separated into a group primarily according to external and structural features, i. e.
they have binary structure (right and left part) connected with the help of conjunction. Like phraseological units the overwhelming majority of comparative expressions is characterized by vivid imagery, stylistic colouring, expressiveness and emotionality [1, p. 56].

There are two types of comparative expressions: adjectival and verbal [2, p. 8]. Adjectival comparative expressions are used more frequently. From semantic point of view a distinctive feature of adjectival comparatives is duality of meaning, i.e. when one thing is compared with another one. The first component of adjectival comparatives is usually used in its core (literal) meaning. The function of the second component is intensifying the degree of the characteristic expressed by the first component. The first component is called a basis of comparison, the second is considered to be an object of comparison, the conjunction as is a link word. Adjectival comparative expressions denote different features peculiar to humans and objects. For example, (as) fierce as a tiger; (as) vain as a peacock; (as) cunning as fox; (as) brave as a lion; as hungry as a bear; (as) slippery as an eel [1, p. 65].

Verbal comparative expression is a structural model consisting of a verb, link word like and a noun, which expresses the object relationship. The function of the second element usually performs an animalistic component: to die like a dog; to die like flies; to be black as a crown’s wing; like a bull (a cow) in a china shop; like a bear with a sore head. The second component in these structural models performs the function of intensifier of verb meaning: to drink like a fish; to work like a horse [2, p. 10].

Thus, the detail study of functioning of English comparative expressions with animalistic component makes it possible to describe its main structural patterns, analyze the main ways of their formation and systematize the phraseological system of English language.

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**SEMANTIC AND FUNCTIONAL FEATURES OF EUPHEMISMS IN ENGLISH**

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The actuality of this work is explained by the rapid growth of English vocabulary and by emerging of euphemisms – new words that possess potentially positive connotation.
This article aims at defining general and functional characteristics of euphemisms and analyzing the impact they have on the forming of the modern English vocabulary.

In modern English stylistically neutral words and expressions are becoming widely spread. They are used instead of synonymous language units which can be considered as obscene, rude, sharp or tactless. This phenomenon is called euphemisation.

The definition given in the Cambridge Encyclopedia of English Language describes euphemism as the use of a vague or indirect expression in place of one that is unpleasant or offensive.

In his Oxford Dictionary of Euphemisms, R.W. Holder explains that in speech or writing we use euphemism for dealing with taboo or sensitive subjects. It is therefore the language of evasion, hypocrisy, prudery, and deceit.

The active usage of euphemisms favours the development of already existing synonymic row. For instance: lie, tell lies – euphemisms: invent, make up, fabricate, tell stories; swelling, tumor, cancerous growth – euphemisms: omination, neoplasm, new growth.

From semantic standpoint the emerging of euphemisms is based on the elevated naming of the object. The speaker seems to enhance the positive effect, to create divergence between notion and object. Indirect definition is the main distinctive feature of euphemisms. In psychological terms it is manifested through the establishment of associative links between the denotatum which direct meaning is considered taboo (direct denotatum) and the associative denotatum.

There are several reasons for emerging euphemisms:
- The principle of politeness (when different kinds of physical or mental handicaps are lightened);
- The taboo principle (when dealing with diseases or death);
- The regulatory principle of influencing the mass recipient (in political field);
- Pragmatic purpose to make a secret out of someone’s activity (in military field).

Summing up what has been said we can see that the motivation of using the euphemisms by native speakers can be different nevertheless they are always used for the common purpose – replacing the socially or psychologically unacceptable direct nominations by the analogous but more neutral ones. It facilitates greatly the process of communication in certain fields.

References:

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The theme of researches about part of speech classification in Modern English is very topical, especially it concerns function words. Many scholars such as Henry Sweet and Charles Fries developed the classification of parts of speech, others such as Sidney Greenbaum [4], Martin Haspelmath [1], Thomas Klammer [2], M. Blokh [5], L. Volkova [3] and V. Kaushanskaya [6] made profound researches about functional parts of speech.

Function words in English have little lexical or ambiguous meaning, but instead they are used to express grammatical relationships with other words in a sentence, or specify the attitude or mood of the speaker.

The linguists are trying to make single classification for function words within the history but even nowadays there is no one common opinion on this problem. There are four main approaches to this problem: Classical, developed by prescriptivists; Functional, developed by descriptivists; Distributional, developed by structuralists and Complex, which includes three previous ones.

The main problem of function words classification is that function words can belong to more than one class. In most examples, we can only refer a word to a word class when we encounter it in context.

According to the scientist Sidney Greenbaum: «we recognise the class of a word by its use in context. Some words have suffixes that help to signal the class they belong to. These suffixes are not necessarily sufficient in themselves to identify the class of a word. For example, -ly is a typical suffix for adverbs (slowly, proudly), but we also find this suffix in adjectives: homely, manly. And we can sometimes convert words from one class to another even though they have suffixes that are typical of their original class: an engineer, to engineer» [4, p.152].

To the basic grammatically relevant classes of function words in Modern English belong the article, the preposition, the conjunction, the particle, the modal word and the interjection. Each of them has specific functions, classifications and usage in the English language.

References:
Innovations’Role in Providing Competitive Abilities of National Economy

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Being competitive is one of the most important macroeconomic quality of industrialized countries. It is also expected to be the main characteristic every business entity should own, does not matter whether it functions on national or international level.

From the other side of the coin, the influence of innovations on economic growth increases constantly.

The term ‘innovations’ was used for the first time by Austrian economist Joseph Schumpeter in 1912. He has also created the Theory of economic development, where insisted that innovation is an essential driver of economic dynamics and competitiveness.

The question of globalization and connected to that innovation is especially up-to-date for our country. Now that Ukraine is trying to be an equal partner to other developed countries in the international economics community, the importance of following scientific progress is paramount. Besides, implementing economic know-hows would help us to increase tax revenues to countries budget, overcome unemployment and improve the standard of living on the whole. Here is a list of problems Ukraine should solve to get closer to its goal:

- Imperfection legal and institutional framework for innovation business;
- Inconsistency available sources and funding research, education, basic and applied scientific research needs innovative development;
- The lack of an effective system to stimulate business in the market of high technology;
- Imperfect mechanisms of economic and moral motivation of invention;
- Low activity use of intellectual property in the sector of small and medium enterprises;
- Underestimation enterprise intellectual capital;
- Undeveloped economic mechanism of innovation management;
- Low information support innovation;
- High-risk innovative entrepreneurship and lack of an established business venture;
- Immunity enterprises to innovate

However, using innovations is yet not one of the main factor for raising competitive abilities. Thereby, Ukrainian economy should operate basing on new technologies, which is supposed to create benefits for domestic manufacturers in competition against its opponents on national and international markets and help Ukraine to be in a list of the most developed countries in the world.

References:

THE CONCEPT OF MODALITY AND MEANS OF ITS REPRESENTATION IN ENGLISH ADVERTISING TEXTS

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Nowadays modality is one of the most studied phenomena in linguistics. Like most linguistic concepts it is of ambiguous nature, and modern Ukrainian and foreign scientists treat modality differently. First of all, this trend is due to the fact that the notion of modality is multidisciplinary. For example, as L.P Voinalovych noted, the notion of modality was used by Aristotle in his work “Metaphysics” regarding logic [1, p. 28]. The notion of modality is widely used in philosophy, where it is determined as the existence of any object or occurrence of a phenomenon (ontological modality) or way of understanding, opinions about the object, phenomenon or event (epistemological or logical modality) [1, p. 29]. The ambiguity of modality points to the necessity of its studies in linguistics. Moreover, modality is rather peculiar to advertising texts which makes it a very topical phenomenon.

In modern linguistic encyclopedia modality (from Lat. Modus – “measuring method”) – is a functional - semantic category, which expresses different kinds of opinions related to reality, and various kinds of subjective qualifications messages [2, p. 303]. In English glossary of linguistic terms by Eugene E. Loos, comparing the mood and modality, the linguist provides the following definition of the studied notion: “Modality is the limit illocutionary force, defined by grammatical means (e.g. mode of action), reflecting the illocutionary point or the general intention of the speaker, or expression likelihood, desire, commitment or reality of his judgment”. It is also stated that modality is synonymous to illocutionary force (illocutionary force) [3]. Illocutionary force – is a type of speech act, which the speaker intends to make at the time of the statements’ pronunciation: orders, questions, requests, statements, promise, etc. [4, p. 355].

Since there are various views on modality, there are also different approaches to its classification. Nevertheless, the most classic one is defined by V.V. Vinogradov, i.e. objective and subjective modality, which specifies the modal expression of reality and speaker.

Objective modality is a relation of what is said by speaker to the reality [5, p. 101]. Schematically, it can be shown in the following way:

```
+----------------+-----------------+              
| Speaker         | What is said    | Reality/   
|                 |                 | objectivity|
```

Subjective modality depicts the attitude of the speaker to the content of expression [5, p. 101]. Schematically it can be represented as follows:

```
        +----------------+        
        | Speaker         | <= >
        |                 | 
        |                 |        
        | What is said    |  
```
In addition to the above listed types of modality foreign scientists also distinguish degrees of modality, namely high (strong), medium, low (weak) modality. For example, Sigrid Norris argues that the degree of modality types determine modal intensity [6]. For example:

\[
\begin{align*}
\text{might go} & \quad \text{could possibly go} & \quad \text{should go} & \quad \text{will go} & \quad \text{will definitely go} \\
\text{It could be hot outside.} & \quad \text{It is probably hot outside.} & \quad \text{It is hot outside}
\end{align*}
\]

The diversity of views on modality and its typology leads to different approaches to the means of its implementation. However, the following means were determined:

1) phonetic (accent, intonation)
2) lexical (words with modal value)
3) lexical and grammatical (modal verbs)
4) grammar (mood)

Phonetic means play an important role in creating an emotional component of advertising. The presence of modality in an expression is one of the ways to convey speaker's attitude to what is being said and provoke emotional reaction to the message. Phonetic means of modality representation refer subjective and logical phrase accent and intonation. It should also be noted that advertising texts often use onomatopoeia, interjections, wordplay at the phonetic level and so on. For example: “Ya, but how do you know it hurts?” “That's why we insure women”; “Stained in a dash, gone in a flash”, “A powerful acne cleanser could not possible smell delicious. Scratch that thought. Sniff it”.

The vast majority of linguists (FR Palmer, W. Frouli, F. de Haan, J. Hladki, I.V. Korunets, I.V. Sokolov, D.V. Veselovska etc.) state that words with modal meaning belong to lexical means of expressing modality. These words include adverbs, particles, verbs and nouns with modal meanings. For example: “Affective is too a word!”, “Probably the best dog training school”, “Apple. Think different”, “Human bodies are made of 70% water, the other 30% should be responsibility”[7].

Modal verbs represent the lexical grammatical means of expressing modality. Unlike other verbs, modal verbs do not indicate an action or state, they indicate the relationship of the speaker to the action. In English modal verbs express possibility, probability or improbability, obligation, necessity, desirability, doubt, i.e. everything that has to do with the modality. In advertising texts modal verbs are used to emphasize certain characteristics of products or services, and encourage consumers to
Innovations in Science and Technology

an action. For example: “A small faulty screw once crashed an airliner taking 219 lives. Your body is machine 10X more complex. Smoking can damage any single part of it”; “You can read the news. Or read Newsweek”, “Now the colours of life can last a lifetime. Valspar Paints”[7].

Grammatical means of modality are represented by mood. After analysis of about 800 advertising slogans, it was found that most of them contain a verb in an imperative form. For example: “Take control of your finances. Continental savings Bank”, “Make $ 300 the easy way”, “Love it. Hate it. Just do not forget it. Marmite”, “Take a break from the usual. KitKat”, “Buy new private apartments”, “Keep your feet on the ground. Petlas Tires”[7]. This is mainly due to the fact that the main task of advertising text is to encourage potential buyers to purchase the product or use the service.

All in all, it can be concluded that modality is a multidisciplinary concept that in linguistics expresses different types of statements that are related to reality. Thus, scholars distinguish subjective and objective modality. In advertising texts modality is expressed using phonetic, lexical, grammatical and lexical grammatical means. The use of such a wide range of means is explained by the necessity of advertising texts of conveying its communicative purpose in short sentences or even phrases.

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ABBREVIATIONS AND THEIR USAGE IN THE ENGLISH LANGUAGE
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Nowadays the Internet has become an integral part of people’s everyday life. It is used for different purposes: work, education, research, recreation and communication. Like any other medium in which intercommunication may take place the Internet influences the whole communicating process and its components including the language. In the first instance it concerns English as a global language. Being the language of World Wide Web it has to adapt to modern interlocutors’ needs permanently.

To make the communication easier and more efficient Internet users began “to refashion general (or standard) English into abbreviated and sometimes pictographic representations of existing concepts where layers of meaning are packed into a few keystrokes” [1, p.2]. And the result of this process is the so-called Internet slang. The
Internet slang (also Internet shorthand, Cyber-slang, netspeak, digispeak) is described as a diversity of slang languages used on the Internet although “it is difficult to provide a standardized definition due to the constant changes made to its nature” [4].

Internet slang is not a homogeneous language variety. It can differ according to the user, his purposes and the type of an Internet situation. To achieve the goals of creating a sense closeness, rapid communication and compensation for missing face-to-face cues, speakers may manipulate “typography (keyboard symbols, e.g. using @ for the letter a), orthography (alphabet and spelling, e.g. changing the spelling of please to plz), morphology (word-formation, e.g. adding the suffix –ers to lol to create lolers, those who laugh out loud), and syntax (combining words into utterances/sentences, e.g. omitting parts-of-speech)” [1, p.58]. The aim of our paper is to consider abbreviations which deal with morphological level of the language.

Abbreviation is a shortened form of a word or a phrase. Abbreviations can be divided in two categories. “They either eliminate letters or punctuation from a word or reduce the number of keystrokes. Abbreviations include acronyms, shortenings, clippings, single-letter forms, letter homophones, number homophones, symbolic substitution, punctuation omission, and non-standard use of lowercase” [1, p.58].

- **Acronyms and initialisms.** Acronym is a type of abbreviation formed from the initial letters of other words and pronounced as a word. Initialisms are essentially the same but they are pronounced separately. For example, LOL (laugh out loud/lots of love), ISTM (it seems to me), TTFN (ta-ta for now), POV (point of view).

- **Shortenings** are abbreviations where some parts of a word are extracted from the beginning, middle, or end of a word. For instance, ppl (people), k (OK), puter (computer), NVMD (nevermind).

- **Clippings** are “a type of abbreviation where the final letter is dropped from the word” [2]. Examples: comin (coming), goin (going).

- **Letter homophones** are type of abbreviation “where a letter is substituted for its sound” [3]. They may represent the sound of an entire word or a syllable. In fact, the pronunciation of the letter matches the pronunciation of the word or its part. For instance, C U (See You!), bhold (behold).

- **Number homophones** “substitute a number for the sound of an entire word or a sound within a word (e.g. a syllable). The pronunciation of the number matches the pronunciation of the word or word part” [1, p.62]. For example, W8 (wait), 10q (thank you), NE1 (anyone), F9 (fine).

- **Symbolic substitutions** are abbreviations where a non-alphabetical symbol is used to represent a word or concept in an unusual way. Examples: apples > bananas (apples are better than bananas), 4 (for), <3 (love).

- **Punctuation omission.** For instance, in such words as dont (don’t) and ive (I’ve) an apostrophe is omitted.
• **Non-standart use of lowercase.** The initial, proper names, and the pronoun *I* may not be capitalized. Examples: *i dunno* (*I don’t know*), *going to miami* this wk (going to Miami this weekend).

As more people use the Internet, more new terms may be created. Subsequently they may be used outside of online environment and even fixed in dictionaries, e.g. in April of 2011 the popular acronym LOL (laughing out loud) was added to the Oxford English dictionary.

**References:**

**UKRAINIAN’S GOLD AND FOREIGN EXCHANGE: STATE AND PROBLEMS**

**Kristina Zadko**

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The economy of every country is a big and difficult system. It is based on certain monetary unit, which is national (Ukraine – hryvnia, Russia - ruble, Great Britain - Pound a starling) or collective (euro). The monetary unit which is intended for payments in trade operations is called currency. The currency is the physical part of the national money supply.

Globalization and integration world and the national financial markets create need of existence of protection of national economy against external negative influence. This protection is gold and foreign exchange reserve which contains in foreign assets and serves as a peculiar buffer for economy. Foreign-exchange reserves (also called forex reserves or FX reserves) are assets held by central banks and monetary authorities, usually in different reserve currencies, mostly the United States dollar, and to a lesser extent the Euro, the Pound sterling, and the Japanese yen, and used to back its liabilities. Such signs are peculiar to gold and foreign exchange reserves: reliability, liquidity, constant availability, careful selection of assets. Priority functions of gold and foreign exchange reserve of Ukraine is:

- service of an external public debt;
- implementation of currency interventions for the purpose of maintenance of stability of an exchange rate of hryvnia;
- support of stability of trade balance;
- formation of the state fund of accumulation of financial resources.
Almost in all countries the gold and foreign exchange reserve is property of the state and society. Now in Ukraine there is absolute freedom and independence of National bank. Its board determines the volume, placement and use of currency reserves. It creates negative consequences which break financial stability and threaten economic security of the country. In Ukraine only the National bank can make decisions "about the minimum size of gold and foreign exchange reserves of National bank" and exercise "control of gold and foreign exchange reserves" and regulate import and export of the capital. According to the IMF, for February 1, 2015 official reserve assets of Ukraine made 6419.7 million US dollars, thus monetary gold (including gold deposits and gold in swaps) — only 967.3 million dollars (15.07% of the total amount of reserves). The lion's share of the international reserves of Ukraine is made by assets in convertible currencies (securities, currency and deposits). Now the Ukrainian economy is in a crisis state, gold and foreign exchange reserves decrease though attempts to stabilize a situation with the help of the IMF are applied.

In my opinion full-fledged gold and foreign exchange reserves and the predicted rate of exchange of national currency are reached by both economic and political methods. Therefore, stabilization of an exchange rate has to be controlled at the highest state level and have prime value.

References:

THE DEFENCE OF INTELLECTUAL PROPERTY OBJECTS RIGHTS IN THE INTERNET MASS MEDIA
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A virtual media is a rapidly developing field. So, vlogs came after the blogs and social networks aim to satisfy everyone’s tastes: one can be a critic, a photographer, a filmmaker, or just feel like a star. This is a fertile basis for Psychological Science, but the greatest interest presents the legal aspect in the context of the protection of property and non-property rights in the Internet. The relevance of this topic is defined by the fact that in 2015 there are still no laws regulating the activities of the Internet mass media in Ukraine.

The previous experience of scientific elaborations has dualistic nature: some believe that it is necessary to find innovative solutions to the legal protection of intellectual works, others recognize it inexpedient and sometimes unprofitable.

The Law of Ukraine “About Television and Broadcasting” [1] includes the following definition: “an audiovisual (electronic) media – is an organization that
provides audiovisual information transmitted in the form of electrical signals and adopted by means of consumer electronic products for mass consumer perception”. Indeed, this is the only legal definition for the online media and other electronic broadcasting organizations, such as Internet radio or -television. 

Of course, copyright objects have all prerequisites for protection and at the same time the technology development and high-speed growth of information do not guarantee the preservation of their relevance, and sometimes copyright. 

Plagiarism and “piracy” became the major kinds of violation of the original author’s rights. Andrew Buzynnyy [2] offers three main ways to protect rights:

1. letters to the owners of unauthorized publications or site administrators, or claims to hosting providers;
2. interaction with the third party, such as search services like Google, that means, for example, the application of ‘pessimization’ of the offender’s site or complete removal from the system;
3. court disputes.

If your article has been already published, the sites http://copyscape.com/ or https://www.grammarly.com/plagiarism-checker will help check it for plagiarism. In order to find out who is the hosting provider of a plagiarist it is necessary to use the appropriate sites, such as https://www.nic.ru/whois and to type in the search box IP address or domain name.

Furthermore, some sites use the programs of technical type that prevent copying or allow copying information indicating the original source and the author’s name (copyright sign, ©). However, this method does not always prevent from the plagiarism, because programmers would find contrariety and other users can use “Prt Sc” key or trivially rewrite by hand or using special tools of decryption. But society (in particular ours) perceives such initiatives negatively, regarding the aggressive distrust from the owners of the rights and restrictions of their own. It should be noted that there are other ways of defense of intellectual property rights. As far as the legislation has the so-called presumption of authorship, it is essential to reinsure and minimize the doubts. If the work claims to have an artistic value and a reward, then it won’t be superfluous to send a registered letter to oneself with a work inside, where the postmark will include the date and other information that will be necessary for judicial evidences. More expensive but de jure more thorough way is the notarized original. The traditional paper publication in specialized journals will also be useful.

A copyright sign or the name of the author, which is a kind of a watermark is frequently seen at the photo’s or picture’s bottom right or even at the image. However, numerous legal forums advise to use the procedure of depositing, which is actually a duplication of a notary procedure in their understanding [3]. Nonetheless The All-Russian Institute of Scientific and Technical Information in order to deposit scientific publications at the VINITI [4] declares depositing as a special way of publishing scientific papers in electronic form that provides free access to all comers. Such a preprint is usually used for theses, synopsis or other intermediate research results.
As a result, it can be concluded that the Internet space is quite specific and therefore the issue of copyright’s protection should be given special attention and inventive talent. It is necessary to sum up that there are grounds to assert that the incorporeal rights (right of authorship, etc), should be kept in the dynamic electronic space (mass media’s or other resources) but for the time being there are no means that would ensure full implementation of a similar situation concerning the non-property rights.

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