

**МІНІСТЕРСТВО ОСВІТИ І НАУКИ,  
МОЛОДІ ТА СПОРТУ УКРАЇНИ  
СУМСЬКИЙ ДЕРЖАВНИЙ УНІВЕРСИТЕТ**

**СОЦІАЛЬНО-ГУМАНІТАРНІ АСПЕКТИ  
РОЗВИТКУ СУЧАСНОГО СУСПІЛЬСТВА**

**МАТЕРІАЛИ  
ВСЕУКРАЇНСЬКОЇ НАУКОВОЇ КОНФЕРЕНЦІЇ ВИКЛАДАЧІВ,  
АСПІРАНТІВ, СПІВРОБІТНИКІВ ТА СТУДЕНТІВ ФАКУЛЬТЕТУ  
ІНОЗЕМНОЇ ФІЛОЛОГІЇ ТА СОЦІАЛЬНИХ КОМУНІКАЦІЙ**

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**SPEAKING TESTS. ORAL INTERVIEWS**

L. Iarmak, *EL teacher*,  
O. Gladchenko, *EL teacher*

To make speaking tests less intensive it is advisable to forestall them with oral interviews. Many teachers think of the interview as simply a series of questions and answers. And some amount to no more than that: «What is your name? How old are you? ». But the whole thing is held together by the constant interaction of the interviewer and the student. Instead of simply reciting information, the student is actually talking with someone! The oral interview can provide a genuine sense of communication. For this reason rapport is important. Most of us remember being ineffectual on occasion when feeling threatened or talked down. The good interviewer is neither harsh nor familiar, condescending nor intimidating. A sincere, open, supportive manner is most effective. For this reason a guided oral interview is recommended. Your cues for the interview need to be prepared in advance. Parts of the interview - especially the initial warming up - can appear so relaxed that the student may not even be aware that he is being evaluated at that moment. If you know something about the student you can tailor and personalize the questions. A variety of question types is used, especially when testing new students whose skills we are not sure of. Early in the interview we may ask yes / no questions. More demand is placed on the student when we use an information (wh-) question. Appropriate responses to statements are still more demanding. It is important when using statements as cues to pause briefly and look at the student as though expecting a response. Otherwise examinees may not feel that any response is needed.

Items on the guided interview will vary in difficulty, with easier questions coming earlier. However, after a rather challenging item or two, it is good to insert one or two easy questions. This can help relieve tension and allow the student to regain confidence. The level of difficulty of items should vary both to maintain student confidence and the flow of the interview and also provide an opportunity for the teacher to see how competent the student really is. For upper-intermediate to advanced students the interview can be concluded with a challenging item on some contemporary social issue.

Finally, the interview should not be limited to just questions or statements. Visuals and paraphrase techniques can be used.

## **THE MEANS OF LITERARY CONFLICT VERBALIZATION IN THE NOVEL BY KEN KESEY “ONE FLEW OVER THE CUCKOO’S NEST”**

Mokhonyok Z.A.

The article focuses on the linguistic means of literary conflict verbalization in the novel by Ken Kesey “One Flew over the Cuckoo’s Nest”.

The problem of the conflict realization in its linguo-cognitive aspect in modern linguistics has been undervalued. Sporadically it was dwelled upon by I.Stepanchenko, V.Lukin, O.Selivanova. No linguo-cognitive analysis of Kesey’s novel “One Flew over the Cuckoo’s Nest” has been done. The only source available is A.Zverev’s article published in 1989.

So, the growing interest toward the linguo-cognitive analysis of literary prose in contemporary linguistics predetermines the actuality of the article.

The aim of the research is to dwell upon linguistic means of literary conflict representation in the novel by K.Kesey “One Flew over the Cuckoo’s Nest”. And the object of the article is the literary conflict and its means of verbalization in the novel.

The novel “One Flew over the Cuckoo’s Nest” by K.Kesey is replete with conflicts, that is deeply rooted in its background. It was finished in 1962. Political, ideological and social confrontation in the society of this period reached its peak. K.Kesey has become an ideologist and innovator in literature by describing the psychiatric hospital and its everyday routine. What makes the conflict even more acute is the characters with accentuated personalities. According to Ya.O.Bondarenko 3 types of speech accentuated personalities are identified: paranoial, depressive and demonstrative. To illustrate this classification we are to dwell upon the main characters of the novel. K.Kesey divides all the personages into the Acutes and the Chronicles:

*“One side of the room younger patients, known as Acutes because the doctors figures them still sick enough to be fixed, practice arm wrestling and card tricks... The Acutes move around a lot. The tell jokes to each other and snicker in their fists (nobody ever dares let loose and laugh, the whole staff’d be in with notebooks and a lot of questions) and they write letters with yellow, runty, chewed pencils.”*

*“Across the room from the Acutes are the culls of the Combine’s product, the Chronicles. Not in the hospital, these, to get fixed, but just to keep them from walking around the streets giving the product a bad name. [...] Chronicles are divided into Walkers – can still get around if you keep them fed, and Wheelers and Vegetables.”*

The discourse of the paranoid speech personalities is the most conflicting. The cognitive basis of their high conflictness is such psychological features as suspiciousness, hostility towards others, inadequate self-assessment and intolerance. They are the initiators of conflicts. The brightest example of this type is a Chronic Ruckly:

*“Ruckly is another Chronic... He was been a holy nuisance all over the place, kicking the black boys and biting the student nurses on the legs, he told the black boys as they backed away from him: “You’ll pay for this, you damn tarbabies”.*

The depressive accentuated personalities can also be the initiators of the conflicts. The cognitive grounding of their verbal conflictness is self-underestimation, inclination to self-blaming and the feeling of frustration and depression. They mainly play the role of the victim in the verbal conflicts using moderate conventional communicative strategies. The examples of this type are Billy Bibbit and Pete Bancini:

*“Usually Pete’s eyes are half shut and all murked up... His voice lost its copper strength and became urgent like he didn’t have much time to finish what he had to say. “I was born dead. Not you. Ahhhh, it’s been hard... I can’t help it. I was born a miscarriage. I been dead fifty-five years”.*

In contrast to paranoid and depressive speech personalities, the verbal conflictness of whom is caused firstly by inner cognitive factors, the demonstrative accentuated speech personalities use the conflicting speech behavior to manipulate an addressee. The example of such character is Miss Ratched:

*“I’m sorry to interrupt you and Mr. Bromden, but you do understand: everyone... must follow the rules”. “You are committed, you realize. You are...under jurisdiction of me...the staff. Under jurisdiction and control.”*

Therefore, having analyzed three types of accentuated personalities, we have defined the criterion for their differentiation, that is the degree of their conflictness and its pragmatic aim.

The linguistic means of literary conflict representation have been analyzed through the image of the personage. The means of the conflict realization correlate with the type of the accentuated speech personalities.

# THE IMPORTANCE OF MOTIVATION IN LEARNING ENGLISH

I.A. Morozova, *Senior Teacher*

In the most common definition, motivation is referred as a psychological trait which leads people to achieve a goal. For language learners, mastery of a language may be a goal. For others, communicative competence or even basic communication skills could be a goal. Standard Oxford definition states that "Motivation is the reason of the reasons behind one's actions and behaviour". While Gardner defined it as "Referring to the extent to which the individual works or strives to learn the language because of a desire to do so and the satisfaction experienced in this activity".

The motivation results from several psychological needs of individual. Generally people are motivated to do things in order to satisfy their esteem, get rid of the instability, insecurity and to achieve rewards of some sort. The motivation can be further classified into integrative and instrumental.

Motivation has been identified as the learner's orientation with regard to the goal of learning a second language (Crookes and Schmidt 1991). It is thought that students who are most successful when learning a target language are those who like the people that speak the language, admire the culture and have a desire to become familiar with or even integrate into the society in which the language is used (Falk 1978). This form of motivation is known as integrative motivation. When someone becomes a resident in a new community that uses the target language in its social interactions, integrative motivation is a key component in assisting the learner to develop some level of proficiency in the language. It becomes the necessity, in order to operate socially in the community and become one of its members.

In contrast to integrative motivation is the form of motivation referred to as instrumental motivation. This is generally characterised by the desire to obtain something practical or concrete from the study of a second language (Hudson 2000). With instrumental motivation the purpose of language acquisition is more utilitarian, such as meeting the requirements for school or university graduation, applying for a job, requesting higher pay based on language ability, reading technical material, translation work or achieving higher school status. Instrumental motivation is often characteristic of second language acquisition, where little or no social integration of the learner into a community using the target language takes place, or in some

instances is even desired. It is important to note that instrumental motivation has only been acknowledged as a significant factor in some research, whereas integrative motivation is continually linked to successful second language acquisition. It has been found that generally students select instrumental reasons more frequently than integrative reasons for the study of language. Those who do support an integrative approach to language study are usually more highly motivated and overall more successful in language learning. Brown (2000) makes the point that both integrative and instrumental motivation are not necessarily mutually exclusive. Learners rarely select one form of motivation when learning a second language, but rather a combination of both orientations.

Motivation is an important factor in L2 achievement. For this reason it is important to identify both the type and combination of motivation that assists in the successful acquisition of a second language. At the same time it is necessary to view motivation as one of a number of variables in an intricate model of interrelated individual and situational factors which are unique to each language learner.

Sometimes a distinction is made between positive and negative motivation. Positive motivation is a response which includes enjoyment and optimism about the tasks that you are involved in. Negative motivation involves undertaking tasks for fear that there should be undesirable outcomes, eg. failing a subject, if tasks are not completed. The following are the keywords that "Motivation" triggers in our minds:

\*Goal

\*Energy

\*Effort

\*Active involvement

\*Desire

\*Persistence

Educational psychologists point out three major sources of motivation in learning:

1. The learner's natural interest: intrinsic satisfaction.
2. The teacher (institution) employment: extrinsic reward.
3. Success in the task: combining satisfaction and reward.

In order to make the language learning process a more motivating experience instructors need to put a great deal of thought into developing programs which maintain students' interest and have obtained short term goals. At university level this may include any number of foreign exchange programs with other universities, overseas "homestay" programs, or any other activities which may help to motivate students to improve their target language proficiency.

## WHAT MAKES A GOOD TEACHER CONCERNING IP?

I.A.Bashlak

The subject itself is rather controversial .Is it a must for a teacher using technology to be an expert in this field of expertise? Or it's a good idea to rely on professionals in terms of computer training? I'm interested in exploring this question, . I guess whether you're a teacher of information and communications technology, or someone who teaches with educational technology, there are some common denominators of what makes the teaching good.

The first requirement is a willingness to experiment and take chances. You never really know whether something is going to work until you try it. A piece of software may be great when used by an individual, but not scale up very well when used with a class.. But you will never know it until you sit down with the software and spend time using it and thinking about it. Not everything is within the individual teacher's control. I am thinking in particular of the next requirement: the opportunity to experiment. Too many schools, colleges and universities are so frightened of being named and shamed for not having achieved the requisite number of passes at all sorts of tests that it takes a very brave, stupid or fortunate teacher to feel that they have the time and the support to be able to try things out, especially given the amount of stuff that has to be covered in the curriculum. A third requirement is for intellectual honesty. I think one of the most difficult things to do is to admit to oneself, let alone one's colleagues, that as far as achieving X is concerned, the last 3 weeks have been less successful than one would have liked. But there are a few counters to this way of looking at things: Firstly, adopt the scientific view: an experiment is only a failure if it yields no results at all, ie you find out nothing from it. If you get negative results, you've learnt something which will be useful to both yourself and your colleagues.

Secondly, take a cost-benefit approach. Basically, even if the experiment looks like having been a waste of time, if the benefits outweigh the costs, than it hasn't been. This is all a bit subjective, of course, but let's consider an example. Suppose the use of a website or application has added nothing to the knowledge of 15 of the students in your class, meaning that you wasted a few hours preparing the lessons based on it, and those 15 pupils have wasted the one or two lessons they spent on it. But at the same time, one student, who was thinking of quitting the course, and who has

already mentally opted out, is suddenly fired up by the experience and really starts to 'get it'. It's arguable that the net gain has outweighed the net cost. Thirdly -- and this leads on nicely from the point just made -- it may be that your success criteria need to be changed. In the example of 15 students gaining nothing in terms of learning anything new, if I was the teacher I would ask them to analyse why they gained nothing, and how the resource (or my use and teaching of it) could have been improved. Also, academic achievement has to be balanced by other kinds of development. If the website or program added nothing to their knowledge or technical skill set, but facilitated critical thinking or collaborative working -- even though they may not have been the intended outcomes -- then I would suggest the whole thing has been very worthwhile. A fourth requirement for good teaching is a love of the technology. That does not necessarily mean being a geek, but having a love of what the technology can enable you to do. For example, I love my digital camera, my smart TV and smart Nokia cell phone. They are good enough for me and when I use them I feel I am not cut off the mainstream and keep pace with the latest technologies. Really I feel much better surrounding myself with this kind of stimuli. I can slip my camera or a mobile telephone in my pocket or briefcase, and I use it to take shots which are either interesting in themselves, and which I could therefore use as stimulus material, or to illustrate all sorts of projects. A fifth requirement is a willingness to not know everything. I think that when it comes to technology, there is every chance that at least one student, and probably all of them, will know more about at least one aspect of it than you do. That's why I have no hesitation in asking my students I know how you do certain things in Facebook or Blog TV. They know things I don't. I also know things they don't. What's so threatening about exchanging knowledge and ideas as equals? Does this mean that teachers should go along with the old chestnut about teachers being a 'guide on the side' rather than a 'sage on the stage'? No, because that is a false analogy. There is no point in spending an inordinate amount of time encouraging kids to discover something that you could have told them in 5 seconds, so the guide on the side thing is not appropriate in all circumstances anyway. I like the way Terry Freedman views the idea of a teacher being a "guide on the side".- "I don't have a catchy phrase to express this idea, but the way I see it, the class is like a group of walkers going on a guided ramble. You have the leader, who knows the terrain and knows what to look out for and to point out. But at the same time each person on the walk is making sense of it all in their own individual way, and discovering other delights that the leader has not pointed out.



## **A FEW PRACTICAL IDEAS ABOUT TEACHING EAP**

S.G Zolotova

Teaching English for academic purposes – EAP - aims to provide students with the integrated language skills: to develop their general and professionally- oriented communicative language competences in English. Keeping in mind professional needs of postgraduates and Master’s students in Ukrainian higher educational institutions, we recognise that their learning outcome level may be required for highly verbal specialism, which will ensure their independent English language communicative competence to function effectively in their academic and professional fields. In the process of growing international academic mobility this level for postgraduates and Master’s students opens up the opportunity for Ukrainian universities to join the European Higher Education Area. Speaking about teaching techniques we often think about methods – the theoretical principles and classroom practices. Modern educators propose some practical ideas on how to improve student’s academic vocabulary, grammar, academic skills in reading and using discourse markers, and academic skills in making presentations.

Most students on English for academic purposes courses conclude that academic or formal vocabulary is possibly the greatest challenge for mastering EAO or ESP – English for specific purposes. Universities teachers can help their students improve their academic vocabulary by:

- allocating a vocabulary slot to each lesson;
- teaching students to analyse dictionary entries with a focus on etymology and levels of formality;
- selecting reading , writing and oral practice materials from appropriate sources and contexts;
- using academic vocabulary games;
- designing a variety of exercises: gap-fill, multiple choice, dictation;
- providing students with models of good practice – this requires the teacher’s ability to use a wide range of academic vocabulary and impart this knowledge to students;
- encouraging students to use Latinisms in English.

Conducting EAP courses determines the selection of the main methods in teaching grammar. One way to personalize a grammar lesson, and introduce a little friendly atmosphere in the class, is to select sentences from student’s work. Usually, there are a couple of problem areas that

appear in the class. For example, undefined subjects – people, everybody – or modal verbs for avoiding direct answer. Just selecting one area can make the point too obvious. These sentences are copied and handed to students. It is useful to get them to work in pairs to find error in each sentence, so initially you must give just one sheet per pair. It is also useful to give them plenary feedback.

As for reading, the university teacher must take into account the fact that academic texts, particularly journal articles, are often long and dense. An important EAP reading skill is being able to tell at a glance how information has been arranged. Students can process information more rapidly if they are able to distinguish a writer's purpose in presenting specific information in a specific sequence. Classic prediction and skim reading tasks can be based around key article sections.

Using discourse markers correctly is one of the essential issues in teaching EAP, as they create fluency or “flow” in text by indicating relationships that exist between the components in it, such as *Nevertheless..., Despite this..., In case you are wondering..., For instance... and Finally...* . Familiarising students with discourse markers means enabling them to recognize markers in normal speech and incorporate them more appropriately into their speech and writing.

Teaching how to make presentations is a useful way of focusing students' attention on the review and application of EAP skills. If handled well, presentations can be an exciting student-focused activity, but they carry the risk of embarrassing students and teachers alike. Students must have sufficient preparation time. Encourage students to use key word notes rather than a complete script. Reading their scripts doesn't work well. Notes make them think and use language live, which generally leads to much better presentations. A few key hints will make the presentation successful: make eye-to-eye contact with people in the audience, speak to the audience not to the ceiling, speak properly, don't rush your words, give your listener time to think, give demonstration of confidence. Ideally, the presentations would be delivered in a conference format, complete in a conference brochure, including abstracts, which students could help to write as part of the presentation planning.

Altogether, the ideas, mentioned above are an interesting and practical way to improve students' EAP skills.

## **THE FRESHMEN AND HIS DICTIONARY ( APPLIED ENGLISH LINGUISTICS )**

V.E .Pronyaeva

Dictionaries are tools, and they are more complicated, and capable of many more uses than students suspect. All of us know students need encouragement and guidance in the use of dictionaries. Composition books for freshmen point out the need for instruction of this kind. Despite what is being done, however, the fact is easily observable that few students are able to use their dictionaries with anything like efficiency. Certainly there must be very few of those who come up through the grades these days who are not familiar with the details of looking up words in dictionaries, but it is one thing to find a word in a dictionary and quite another to understand fully the information there given about it. It seems to me that college freshmen are fully prepared for and could profit by a well planned introduction to the larger of the English dictionaries, and an acquaintance with what they contain. Such a program might well include material of the following kinds. Students should know something about the large, unabridged dictionaries to which they have ready access. An acquaintance with these larger works will not only make the student aware of what kind of information about words is available in them, but it will leave him much better prepared to make efficient use of the desk-size dictionary with which he has some familiarity. It is to be hoped that in such general instructions as may be given about the different dictionaries, some emphasis will be placed on the fact that modern dictionaries do their utmost to record usage, not to prescribe it. The attention usually devoted to instruction in the use of the dictionary apparently stresses spellings, meanings, and pronunciations somewhat in the order here given. The impression, however, inevitably conveyed by instruction restricted altogether to employing the dictionary as a problem-solver, is that such a book is of no particular use unless there is a problem requiring immediate attention. Students are surely tempted to so manipulate things as to avoid encountering problems that drive them to a dictionary. It is to be feared that, for many of them, the dictionary is a form of medicine to be resorted to only in time of unavoidable need. It is a most helpful thing for the student to learn that dictionaries are filled with interesting information from which one can derive much pleasure and instruction, even though he may not be confronted with an urgent problem of any kind. This use of the dictionary when there is no immediate, pressing need to do so, this giving attention to words we have known for a long time but have never grown curious about, is most rewarding.

## SLANG IN INTERNET

N. O. Kravcheko

Slang is a kind of language consisting of very informal words and phrases. Slang is more common in speech than in writing. Slang words are often used in a particular context or by a particular group of people. That is why very important to tell about computer slang. A lot of people communicate with helping of internet nowadays. As our researches showed that more than 50% of them use slang at speaking cause it's such kind of orally speech.

As American writer K. Sanberg said "slang is a language which takes off its coat, spits on its hands - and goes to work". The Concise Oxford Dictionary is more prosaic: "words, phrases, and uses that are regarded as very informal and are often restricted to special contexts or are peculiar to a specified profession, class, etc (racing slang; schoolboy slang)." The problem for learners of English is to know when or when not to use slang. Many people condemn slang, but in fact we all use it. The trick is to use slang in the right context. For the learner, perhaps the first thing to remember is that slang is normally spoken, not written. The second thing is that you may wish to learn slang so that you can understand it when you hear it, but not necessarily to use it. The origin of the word "slang" is unknown. There are many such internet slang words in use, some are more widely understood than others, and new ones are evolving all the time. Such lists are large but inevitably incomplete; however it contains the more commonly used slang words and slang terms. 7670 acronyms are listed at present - if you know of another that should be here then please...

You must know that a few of the internet abbreviations stand for phrases containing words that may be offensive to some people. In those cases we have substituted asterisks, or similar, for the internet slang words in question. Words or letters users use in place for other real words. For example, instead of typing out "are", a user may only type only one letter "r". Chat slang is used as a way to type a long words into short one-to-four letter words and also commonly used for words that are hard for young people to spell. Although chat slang is often easier and faster method of typing it is almost always harder for most users to read and often causes a lot of educated people to ignore you. If you are looking for chat shorthand words such as "cya", "lol", "ty", etc. see the shorthand dictionary definition for a listing of these terms and each of their meanings.

Even there are some groups of slang like as offensive slang and vulgar slang. According to the first group these words should be used with care.

## **ОБУЧЕНИЕ СПЕЦИАЛИСТОВ ПРОФЕССИОНАЛЬНО-ОРИЕНТИРОВАННОМУ ПИСЬМУ НА АНГЛИЙСКОМ ЯЗЫКЕ – НАСУЩНАЯ ПРАГМАТИЧЕСКАЯ ЗАДАЧА И АКТУАЛЬНОЕ НАПРАВЛЕНИЕ ТЕОРЕТИЧЕСКИХ ИССЛЕДОВАНИЙ**

Литвиненко Г.И., *доцент СумГУ*

То, что английский язык является языком международного общения в академической среде – неоспоримая истина. Необходимость обмена научной информацией всё чаще заставляет исследователей не только знакомиться с англоязычными материалами, но и братья за перо с целью публикации результатов своих исследований в зарубежных научных изданиях.

Общение на иностранном языке в письменной форме – гораздо более сложная задача, чем устно-речевая коммуникация. Тем более, что обучение таким умениям вузовскими программами не предусмотрено, а выполнение этой работы профессиональными переводчиками в таких масштабах практически неосуществимо. Если же решать поставленную задачу путём обучения письменно-речевой коммуникации магистрантов, аспирантов и специалистов-исследователей, что было бы вполне естественно, то мы непременно столкнёмся с целым рядом проблем, которые не исследовались ранее.

Те преподаватели, которым приходилось обучать профессионально-направленной письменно-речевой коммуникации, строили этот процесс на основе своей интуиции или практического опыта в области переводческой деятельности. Таким образом, вопросы обучения профессиональному письму на иностранном языке изучены недостаточно. Имеющиеся учебные пособия посвящены в основном ведению деловой переписки и оформлению стандартизированной документации, что связано в первую очередь со знанием определённых форм, клише, моделей. К творческому же процессу, например, написанию научной статьи, это конечно применимо в какой-то мере, но не решает проблему полностью.

Для специалистов совершенно очевидно, что обсуждаемая нами проблема лежит на пересечении переводоведения, функциональной стилистики, семантики, терминоведения, методики преподавания, а возможно, и еще целого ряда областей лингвистики. Во всех указанных направлениях лингвистики накоплено достаточно

материала, который может быть использован в целях создания научно-обоснованной системы обучения указанным речевым умением. Но особое место в этой системе все же занимает переводоведение. Поскольку, хотя речь и идет об обучении навыкам профессионально-направленной письменно-речевой коммуникации, в большинстве случаев фактически мы имеем дело с переводом, так как сначала результат научного исследования формулируется на родном языке, а затем переводится на иностранный.

В описанной ситуации мы безусловно столкнемся с межъязыковой интерференцией, осложненной к тому же недостаточно развитыми умениями письменно-речевого общения на родном языке.

Все вышеизложенное приводит нас к выводу о необходимости обучения основам теории и практики перевода и разработки системы тренировочных упражнений для преодоления межъязыковой интерференции, которая, несомненно, затрудняет восприятие информации, особенно если целевым языком для пишущего служит не родной, а иностранный язык, в частности английский.

На наш взгляд, среди всех видов интерференции особую сложность представляет преодоление грамматической интерференции. Наблюдения показывают, что пишущие в большинстве своём совершенно игнорируют разницу в синтаксисе языка-оригинала и целевого языка, что и приводит к нарушению акта коммуникации, а степень этого нарушения может быть достаточно высокой.

Таким образом, являясь чрезвычайно актуальным, обучение профессионально-ориентированому письму на английском языке требует серьёзного исследования и тщательной разработки. Только в этом случае мы можем рассчитывать на успех.

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## LEARNED WORDS

Марченко Д.О., *ст. викл. СумДУ*

In addition to terms, a text on some special problem usually contains a considerable proportion of so-called learned words, such as approximate a, commence v, compute v, exclude v, feasible a, heterogeneous a, homogeneous a, indicate v, initial a, internal a, miscellaneous a, multiplicity n, respectively adv. This layer is especially rich in adjectives.

The main factor at the bottom of all problems concerning style is the concept of choice and synonymy in the widest sense of the word. All learned words have their everyday synonyms, which may seem either not dignified enough for scientific usage or less precise. The layer also has some other purely linguistic peculiarities. It has been noted, for instance, that the learned layer of vocabulary is characterized by a phenomenon which may be appropriately called lexical supplying. This term is used for pairs like father a :: paternal a, home a :: domestic a, lip n :: labial a, mind n :: mental a, son n :: filial a, sun n :: solar a, etc. In all these cases a stylistically neutral noun of native origin is correlated with a borrowed relative adjective. The semantic relationship between them is quite regular. All these adjectives can characterize something through their relation to the object named by the noun. There are also adjectives of the same root produced by derivation.

The learned vocabulary comprises some archaic connectives not used elsewhere: hereby, thereby, whereby, hereafter, whereafter, thereafter, hereupon, whereupon, thereupon, herein, wherein, therein, herewith, therewith. It also contains double conjunctions, like moreover, furthermore, however, such as, and group conjunction: in consequence, inasmuch as, etc. There may be an abundance of obsolete connectives elsewhere, but in this type of speech they are especially frequent because English tradition for business correspondence requires in many cases the whole message to be compressed into one sentence, no matter how many clauses this might involve.

There are some set expressions used in scientific and other special texts: as follows, as early as, in terms of, etc.

When the occasion is formal, in official documents and business correspondence some words may be used which in ordinary conversation would have a pretentious or jocular ring.

## ПІЗНАВАЛЬНО-ТВОРЧА САМОСТІЙНІСТЬ СТУДЕНТІВ: ОСОБЛИВОСТІ ТА СТРУКТУРА

Міхно С.В., *викл. СумДУ*

Відповідно до Національної доктрини розвитку освіти в Україні у XXI ст. та болонської декларації питання самостійності, творчої діяльності займають чільне місце в навчанні студентів ВНЗ.

Для пізнавально-творчої самостійності основними є мотиви, пов'язані з пізнавальним інтересом та прагнення зробити цікаві завдання, бажанням і умінням внести елемент новизни, творчості. Ознаками цієї пізнавальної самостійності є: уміння пропонувати оригінальний зміст та нестандартні дії, критично мислити, приймати несподіване творче рішення, проявляючи індивідуальний стиль пізнавальної діяльності. П. Ріттер (Англія) уводить новий термін *educereation* (англійське *education* – освіта + англійське *creation* – створення, творчість), тобто освіта для творчості, яка, на думку автора, передбачає розвиток у тих, хто навчається, високого ступеня самостійності.

Більш широко в структурі пізнавальної самостійності можна виділити мотиваційний, орієнтаційний, змістово-операційний, енергетичний, оцінювальний та організаційний компоненти. Мотиваційний компонент включає в себе потреби, інтереси, мотиви, набуття і поглиблення знань, навичок, умінь. Орієнтаційний – цілі навчально-пізнавальної діяльності, а також планування і прогнозування цієї діяльності. Змістово-операційний компонент включає в себе систему провідних знань, навичок, умінь студента і способи навчання. Енергетичний компонент включає в себе увагу студента (сприяє концентрації його розумових і практичних дій навколо головної мети діяльності), волю (забезпечує високий ступінь цілеспрямованої пізнавальної активності в оволодінні глибокими і міцними знаннями). Оцінювальний компонент пов'язаний із систематичним отриманням студентом відомостей про хід власної пізнавальної діяльності, коригуванням й самооцінкою результатів навчально-пізнавальної діяльності. Організаційний компонент містить в собі здатність до самоорганізації та самоконтролю, вольові якості, самодисципліну, інтерес до знань.

Отже, організація навчального процесу може сформувати позитивну мотивацію навчання, від мотивації ж студентів залежить вибір методів і способів педагогічного впливу на них. Найвищим ступенем прояву пізнавальної самостійності вважаємо творчу самостійність.



## ДИДАКТИЧНІ УМОВИ ФОРМУВАННЯ ПІЗНАВАЛЬНОЇ САМОСТІЙНОСТІ СТУДЕНТІВ В ЕВРИСТИЧНОМУ НАВЧАННІ

Усенко Н.М., викл. СумДУ

Зважаючи на проблеми розвитку творчої молоді, здатної оперативно реагувати на зміни у суспільстві, самостійно мислити і приймати рішення стає актуальною розробка теорії і технологій становлення пізнавальної самостійності, виявлення дидактичних умов, за яких ця якість студентів досягла б високого і достатнього рівнів.

Педагогічні умови ми розглядаємо як сукупність об'єктивних можливостей змісту, форм, методів і матеріально-технічних факторів, які забезпечують розвиток особистості в умовах педагогічного процесу.

Розглядаючи категорію педагогічних умов у більш вузьких межах, а саме в межах процесу формування пізнавальної самостійності студентів, ми визначаємо педагогічні умови формування пізнавальної самостійності як спеціально створені фактори, які взаємопов'язані та взаємообумовлені, і в сукупності складають найбільш оптимальне середовище для процесу формування та розвитку даної якості особистості і в кінцевому рахунку впливають на ефективність цього процесу, а також на адекватність його поставленим цілям і задачам.

У ході нашого дослідження було виявлено, що евристичне навчання з його орієнтацією на творчу складову у навчанні надає наступні *умови для формування пізнавальної самостійності* студентів.

**Створення мотиваційної навчальної ситуації**, тобто ситуації, яка має на меті самостійне визначення студентом значимої для нього проблеми й теми самостійної роботи та пошук шляхів її вирішення. Викладач, щоб організувати творчу діяльність студентів, створює або використовує навчальну ситуацію, яка виникає. Її мета – викликати мотивацію і забезпечити діяльність студента у напрямку пізнання обраної теми і вирішення пов'язаних з нею проблем. Роль викладача – організаційно-супровідна, оскільки він забезпечує особистісне вирішення студентом створюваного навчального утруднення.

**Створення рефлексивної взаємодії** – необхідна умова для того, щоб студент і викладач бачили схему організації навчальної діяльності, конструювали її відповідно до своєї мети і програми,

осмислювали проблему, яка виникла, та інші результати. Рефлексія – це не пригадування головного з уроку або формулювання висновків, це осмислення способів діяльності, з'ясування її смислових особливостей, вияв освітнього прирощення студента. Він не просто усвідомлює те, що він виконав, він ще й осмислює способи, за допомогою яких він цього досяг.

***Вивчення і освоєння студентами діагностичного інструментарію щодо виконаних самостійних робіт.*** Уміння навчити студентів корегувати навчальний процес.

***Творча взаємодія суб'єктів навчання на основі допомоги і протидії.***

Педагогічні умови визначають шляхи реалізації поставлених цілей і задач з урахуванням бажаного кінцевого результату, а також з урахуванням відповідності рівня сформованості пізнавальної самостійності та складності поставлених проблем і задач: цілеспрямованість кожного завдання й теми уроку для формування пізнавальної самостійності студентів; відпрацювання отриманих навичок і умінь за допомогою використання реконструктивно-варіативних і творчих самостійних робіт, які підтверджують сформованість відповідного рівня пізнавальної самостійності; тісний зв'язок застосування отриманих знань; фіксація явищ інтеграції в рамках навчально-виховного процесу; поєднання різних педагогічних технологій, які забезпечують варіативність застосування і трансформації знань, умінь і навичок на різних рівнях сформованості пізнавальної самостійності; формування у студентів стійких мотивів до самостійної пізнавальної діяльності. Тут важливо викликати інтерес до самостійної діяльності, сформувати їх мотиви до пізнавальної самостійності, щоб студенти сприйняли цю діяльність як особистісно важливу, організувати процес їх цілеспрямованості, працездатності, впевненості у собі; формування у студентів умінь самоконтролю й об'єктивної самооцінки.

Отже, як і будь-який інший вид педагогічної діяльності і весь педагогічний процес в цілому, формування пізнавальної самостійності протікає в певних умовах, які більшою чи меншою мірою сприятливі для підвищення ефективності формування пізнавальної самостійності студентів на заняттях гуманітарного циклу. Але аналіз робіт, присвячених вивченню пізнавальної самостійності та умов її формування показав, що багато аспектів цієї проблеми потребують подальшого дослідження, а саме уточнення педагогічних умов формування пізнавальної самостійності старшокласників в евристичному навчанні та їх теоретичне обґрунтування.

## РОЗВИТОК НАВИКІВ ЧИТАННЯ У ВИКЛАДАННІ АНГЛІЙСЬКОЇ МОВИ ДЛЯ СПЕЦІАЛЬНОГО ВЖИТКУ – ESP (English for Specific Purposes)

Курочкіна В.С., *ст. викл. СумДУ*

Головною відзнакою ESP є те, що англійська мова не відокремлюється від реального світу студентів; навпаки, вона інтегрується в сферу важливих для них питань.

Читання є однією з стратегій викладання англійської мови. Читання, що покликане підвищити комунікативну компетенцію студентів, має бути зорієнтоване на успіх і збільшити впевненість студентів в їх спроможності до читання.

Читання є цілеспрямованим. Те, як ви читаєте, буде залежати від ваших цілей. Загальні ефективні стратегії аудиторного читання в такій же мірі важливі, як визначення структури тексту.

В залежності від того, що саме ESP студенти читають, використовуються різні стратегії, а саме:

- Визначення теми: хороші читачі можуть розпізнати тему надрукованого тексту дуже швидко.

- Прогнозування і відгадування: читачі угадують зміст тексту, особливо якщо вони спершу визначили тему.

- Читання для загального розуміння: читачі можуть зрозуміти суть тексту, не надто піклуючись про деталі (skimming).

- Читання для отримання спеціальної інформації: це вид читання, коли ми часто звертаємося до тексту для отримання конкретних деталей (scanning).

- Читання для отримання докладної інформації: цей тип читання містить письмові інструкції або наукові методики.

- Інтерпретація тексту: читачі можуть бачити поза буквальним значенням слів в тексті, використовуючи різні підказки, щоб зрозуміти, що саме автор припускає або пропонує.

ESP студентам важливо розвивати стратегії та методи читання, які допоможуть їм у вивченні, розумінні та засвоєнні ключових понять з підручників, есе, романів, технічних матеріалів та інших видів читання. Ці стратегії читання, безсумнівно, допоможуть ESP студентам стати сильнішими, більш критичними читачами.

## MEASURING OF CUSTOMER CAPITAL OF ENTERPRISES

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A.M. Dyadechko, *ELA*

The customer capital is an intangible asset that is based on developing, maintaining and nurturing high-quality relationships with any organization, individual or group that influences or impacts your business including: customers, suppliers, employees, governments, partners.

Measuring of the customer capital can be somewhat difficult as some indicators are not of financial matter. Some aspects of the customer capital might be indicated financially, such as distribution of turnover on market and product, marketing expenses and administrative cost. Attention should be set on the structure and composition of the base of clients a company holds. A question approximating the kind of customer capital distribution, perception of external stakeholders, and an estimate of the number of customers per employee or how many agreements per customer of the company is interesting knowledge. High customer capital would suggest good perception. The distribution of customer capital might include a wide range of different clients, with different visions, size, tasks and industry. Availability is also an aspect that should to be covered concerning customer capital, are the employees available when needed by the customers? The organizations effort to develop relationships is also of great importance, a specific number of customers who have been offered advice might be a good indicator on the organizations effort to develop a relationship. A qualification survey should be assessed.

Other topics of interest could for example be the marketing cost divided with income and administrative cost divided with marketing cost. For the enterprise, the investment in advertising and marketing approaches pays off, not necessarily at once but in the long run. An indication of customer capital could be shown in terms of lost customers, and added ones in the same period. Although this indicator can result in being “0” which would not necessarily mean that the customer capital equal to “0”, if the same amount of customers are new as lost, and as such it might not give a correct picture. To keep the market share stable or rising, there is a need to pursue issues and parameters such as the competence of technology, the cost effectiveness and international profile. An answer to all the questions concerning the customer capital would give a hint of where to place the effort to make an improvement.

Наук. кер. - Золотова С.Г.

## MARKETING INFORMATION SYSTEMS IN DECISION-MAKING PROCESS

Gryshchenko Olena, *post-graduate student*

Past three decades have witnessed an increasing role of marketing information systems in business. More and more companies are faced with the need to control rapidly changing marketing environment. That's why it is currently necessary for companies to have an adequate and effective information support of business activity. On the other hand, to be able to stay in business and to be competitive, a company must gather and analyze relevant information to plan for its marketing actions.

To handle the rapidly increasing information flow and to improve the quality of decision-making process, companies need to use modern information technologies and to implement marketing information systems. In retrospect, the very first descriptive model of marketing information system proposed almost thirty years ago may be attributed to P. Kotler [3]. Since then, more models have been proposed.

Traditionally, marketing information system has been seen as a system to support marketing management in its decision-making. Thus, D. Cox and R. Good [1] describe a marketing information system as a set of procedures and methods for the regular planned analysis and presentation of information for use in making marketing decisions. In addition to the management perspective, marketing information system can be an essential tool for the company's marketing activity. According to the P. Kotler marketing information system consists of four internal components: market and marketing mode system, marketing intelligence system, marketing research system and internal records system. In fact, a marketing information system is like decision support system – it is unique to the company it serves [2]. In any case, the structure of marketing information system should correspond to company's core activities. Marketing information system may be an important tool for business activities and can provide a number of competitive advantages: 1) the effectiveness of business activities (the advanced level of decisions validity, reducing risks, etc), 2) the flexibility and adaptability; 3) an information security (awareness on industry and market trends, on consumer behavior and competition, on possible areas of enterprise development, etc.); 4) the rational distribution and use of information resources (availability of channels and methods of disseminating the information and use of feedback), 5) facilitating the development and promotion of innovations.

A.N.Dyadechko

## ZONAL APPROACH TO THE DEVELOPMENT OF ALTERNATIVE ENERGY IN UKRAINE

Ihor Vakulenko, *post-graduate student*

Deteriorating situation of energy resources on the planet needs to pay attention to the possibility of using alternative energy sources for industrial and domestic needs.

The use of alternative energy sources to replace traditional energy resources is becoming more prominent. The use of alternative energy has significant limitations. But the perspective of development eliminates the disadvantages.

At the initial stage of development of field of alternative energy have a positive impact state and not state support programs. Support programs should be developed as part of development strategy and consistent with each other.

Support for alternative energy in Ukraine is important to consider not only the ultimate goal of applying energy obtained by an alternative, but also resource potential areas where are manufacturers of alternative energy.

There are four natural areas and nine economic regions in Ukraine. Taking into account this and the necessary conditions for different types of alternative energy, it is advisable to allocate 5 zones with favorable conditions for development of not only individual enterprises for the production of alternative energy, but also the creation of regional clusters for the production of alternative energy, which will increase the share of alternative energy in the energy mix.

These are areas proposed to define as:

- North Zone (Volyn, Rivne, Zhytomyr, Kyiv, Chernihiv, Sumy regions);
- West Zone (Transcarpathian, Chernivtsi, Lviv, Ivano-Frankivsk, Ternopil, Khmelnytsky regions);
- Central area (Vinnytsia, Cherkasy, Poltava, Kirovohrad region);
- East Zone (Kharkiv, Lugansk, Donetsk, Dnepropetrovsk, Donetsk regions);
- South Zone (Odessa, Nikolaev, Kherson and Crimea).

Definition of zones is important also to minimize risks. This is explained by uncertainty perspectives of various kinds of alternative energy and the level of adverse environmental impact.

A.N.Dyadechko

## **THE ESSENCE OF COMMON BARRIERS TO EFFECTIVE COMMUNICATION IN AN ORGANIZATION**

L. Yu. Sager, *postgraduate student*

Managers have traditionally spent the majority of their time communicating in one form or another (meetings, face-to-face discussions, memos, letters, e-mails, reports, etc.). Today, however, more and more employees find that an important part of their work is communication, especially now that service workers outnumber production workers and research as well as production processes emphasize greater collaboration and teamwork among workers in different functional groups. Moreover, a sea-change in communication technologies has contributed to the transformation of both work and organizational structure. For these reasons, communication practices and technologies have become more important in all organizations, but they are perhaps most important in knowledge-intensive organizations and sectors and, as such, are of great significance to science organizations and to public science management.

Just about any business, regardless of size, depends on effective communication to operate at peak efficiency. Without it, necessary information is not conveyed or misunderstandings can occur, leading to costly mistakes and unhappy employees. A number of barriers to effective communication may be present in an organization that its leaders should be aware of.

Here are a few of the most commonly-found barriers in communication in an organization:

Perceptual Barriers is any individual perception that causes intended message to be received incorrectly causing barrier to effective communication. No two people view the world exactly the same. Each person has different ideas, thoughts, behaviors, mentality, experiences, and backgrounds. When people communicate, they formulate words to transmit messages based on their own perceptions. The receiver can perceive and interpret actions and words very differently than the sender intends and vice

versa. So, the varied perceptions of every individual give rise to a need for effective communication.

**Emotional Barriers:** Another main barrier is the fear and mistrust that form the roots of our emotional barrier which stop us from communicating effectively with our co-workers.

**Language Barriers:** Language that describes what we would want to express and communicate to others, may at times, serve as a barrier to them. In today's global scenario, the greatest compliment we can pay to another person is by speaking and effectively communicating to them in their local language. We need to understand that the native language of employees can be different from anyone else's.

**Cultural Barriers:** The world is made up of diverse cultures. A cultural barrier arises when two individuals in an organization belong to different religions, states or countries due to lack of understanding or even personal prejudices.

**Physical Barriers:** Research shows that one of the key factors in building strong and integrated teams is **Barriers to Communication That Detract From Organizational Effectiveness**. Physical Barriers is any physical thing that hinders effective communication between one person/group and a second person/group. A physical barrier can be an actual physical structure or distance. Examples include walls, desks, cubicles, doors, yelling down a hallway, or being located in different buildings or rooms. Physical barriers are also anything that causes distractions or breaks concentration. Examples include background noise like radio or ringing phones, poor lighting, seating, or temperature that is too hot or cold.

There are other barriers to effective communication. To solve them there are a number of methods, which are combined to achieve the successful implementation of established company goals.

A.N.Dyadechko



## **A BRIEF HISTORY OF PLASTIC SURGERY**

Bilokon N.O., *JIC -101*

Historically, plastic surgery have been practiced for thousands of years, going back to more primitive methods that were seen in India since around 800 B.C. At that time, plastic surgery procedures consisted of skin grafts that were performed on those that suffered from skin damaging injures. Ancient doctors developed methods to help suture the skin to the body, to help prevent scarring. They performed reconstructive operations on ears and noses that were lost in war or through punishment for a crime. The Romans were also practicing plastic surgery by the first century B.C. Their culture greatly admired the beauty of naked body thus promoting them to improve or eliminate the appearance of any bodily defect or deformity. Their procedures included breast reduction and scar removal.

While many more methods of surgery were developed over the next few thousands of years that could be considered plastic surgery procedures, the field did not see any real major developments until the late 18th century and early 19th century. During that time American surgeons started to develop methods to help repair anomalies like cleft palates.

At the beginning of the 20th century during World War I major advances were made. Because of so many extensive, unprecedented injuries caused by modern weaponry, it was necessary for surgeons to find innovative surgical procedures to reconstruct faces and heads of the wounded soldiers. It was during that time that doctors started to specialize in the plastic surgery field, and real start of the industry was born.

As medical technology advanced and doctors became more specialized in the field, the methods used for plastic surgery procedures became more developed and complex. New devices and techniques are always being invented or discovered. The development of microsurgical techniques has made it possible to replant several body parts, ranging from whole limbs to fingertips, anastomising the divided blood vessels along with nerves and other injured structures. Another advance is immediate breast reconstruction. All patients with breast cancer should have opportunity for consultation with a plastic surgeon to consider the option for both wide focal excision and mastectomy. Many breast departments have plastic surgeons as members of their team, which allows rapid assessment, counseling, and surgery on women requiring mastectomy. Further development of plastic surgery procedures was also caused by the realization that one's personal appearance has the potential to influence (to some degree) one's success.

Ilyina G.S. *EL adviser*

## THE FLOW OF ENERGY

D. Glushenko, *student*

Today we make use of various sources of energy found on earth to produce electricity. Using machines we convert the energies of wind, biomass, fossil fuels, water, heat trapped in the earth (geothermal), nuclear and solar energy into usable electricity. The flow of energy has always been important to advanced civilization. The flow of energy and the integrity of the system can be maintained. Having automatic back-ups means we can do just that. Weather and climate on the Earth are determined by the amount and distribution of incoming radiation from the sun. Energy may be stored for some time, transported in various forms, and converted among the different types, giving rise to a rich variety of weather or turbulent phenomena in the atmosphere and ocean.

Flow of energy is an essential feature of every ecosystem since all living systems are open systems. They depend on a steady supply of energy in order to keep up the structural organization and all life-preserving functions. According to the second law of thermodynamics, each system strives for the state of highest entropy. Natural ecosystems are optimized for a high turnover, while ecosystems influenced by humans, especially agricultural areas, are optimized for an as high as possible rate of net production. Only about 5 percent of all available sun energy is conserved as chemical energy in the biomass of plants. A theoretically optimal 80 percent of this energy can be used by the organisms of the next higher trophic level. The need for alternative energy sources is getting urgent, hence the development of renewable energy is moving fast. Nationally and internationally various individuals and research companies are creating new and exciting energy systems. Some of these apparatus are great works and need improving for massive use. The solution for the above problems can be resolved by renewable energy. Our beautiful planet gives us the opportunity to make proper use of sunlight, flowing water, strong winds, and hot springs and convert these into energy. These energy sources are abundant and free to use. We must be sure that we convert the energy the right way, without causing other problems that can again hurt our environment.

ELA – T.A. Aleksakhina

## **GYPPOKRAT – DER ALTGRIECHISCHE ARZT**

Vasilenko O., Trufan V., Dikun N., *JIC-113*

Ist neben 460 Jahre unserer Ära auf der Insel des Sensens, Griechenland geboren worden. Gypokrat der Sehnen unter Perikla, behandelte der Zeitgenosse Sokrates und Platon, von der erheuchelten Verrücktheit lächelnden Philosophen Demokrita. Er ist als "der Vater der Medizin» und der Gründer der eigenen medizinischen Schule anerkannt. Diese intellektuelle Schule hat gemacht die Medizin in Altertümlichem Griechenland, sie wie die abgesonderte Disziplin, vom Zauber und der Philosophie abgetrennt, mit denen sie traditionell assoziiert war.

Gypokrats schreiben die Urheberschaft bekannten Kodeks Gypokrats zu. Im Übrigen, es ist die Sammlung der Traktate der gebrauchenden Fachkräfte der Medizin, die zur Schule Gypokrata, und der persönlichen Werke Gypokrata gehörten; deshalb ist es darüber sehr wenig bekannt, dass Gypokrat in der Tat dachte, hat geschrieben und hat gemacht. Aber zweifellos, Gypokrat während vieler Alter wird wie das Muster des Arztes wahrgenommen. Insbesondere verbinden mit ihm die systematische Studie der klinischen Medizin, die Systematisierung des medizinischen Wissens der vorhergehenden Schulen und andere Arbeiten.

Wahrscheinlich ist er in der Stadt Larissa gestorben, wo die langwierige Zeit lebte und arbeitete, im Alter von 83 oder 90 Jahren, obwohl einige Zählungen davon zeugen, dass er über 100 Jahren lebte.

Gypokrats nehmen wie des ersten Arztes, der die Vorurteile abgelehnt hat, die Legenden und den Glauben wahr, dass die Krankheit übernatürlich und ein Erzeugnis der göttlichen Kraft ist. Er hat die Medizin wie die Disziplin von der Religion abgetrennt.

Zu den wichtigen Lagen Gypokrata gehören die Forderungen der Sauberkeit (für die Patienten und die Ärzte), die Enthaltung in der Nahrung und Getränk, die Möglichkeit, der Natur zu gewähren, die Behandlung zu führen, dort, wo die reine Luft zu leben: er war überzeugt, dass die Gesundheit vom Gleichgewicht "der Liquore" im Organismus des Menschen abhängt, und der Verstoß ruft die Krankheit herbei.

A.O. Kovalenko, *ES Berater*

## DEVELOPMENT OF THE SURGERY

Aksenchuk R.I., *JIC-102*

### ***Surgery in the past, surgery today***

Surgery is probably no longer the most feared medical procedure. Many of us will go under the surgeon's knife at some point in our lives. We have come to think of surgery as a safe, painless and reliable method to cure us from illness, but this was not always the case. With no pain control and the risk of infection, surgery used to be painful, horrific and dangerous in roughly equal measure and many people died on the operating table. It was usually the last resort for both patient and practitioner.

### ***Early surgery in the Neolithic and Egyptian periods***

The earliest form of surgery was trephining, which involved cutting a small round hole in the head. It was practised as early as the Neolithic period, for reasons that remain a mystery. There are many theories about the reasons behind this practice. The only thing we know for sure is that some patients survived the procedure, and sometimes even had more than one performed. Later, the Egyptians practised trephining in an effort to cure migraines - the idea was to 'let out' the illness that was causing the headaches.

### ***The influence of the Greeks and war on Roman surgery***

Roman surgeons had ample opportunity to pick up surgical skills at the infamous gladiator schools and during the many wars that Rome inflicted on its neighbours and others further afield. Their surgical instruments were similar to those employed by the Greeks. Turpentine and pitch were used as antiseptics, but internal surgery was still considered too risky. The Romans also performed amputations, trephining and eye surgery. The most famous surgeon in Rome was Galen, who was surgeon to the Roman emperor.

### ***Medieval barber-surgeons and war***

But many surgeons were not surgeons in the modern sense. In fact, most were barbers, who combined small surgical operations with performing bloodletting and tooth extraction. In the medieval period, barber-surgeons travelled around the country. They would take up residence in a castle, treat the occupants and also care for any soldiers who were injured in the many small battles that were undertaken between rival factions.

### ***The decline of women surgeons***

Women continued to train as surgeons throughout the 1500s and 1600s, often treating the poor. In fact they were not pushed out of surgical practice until the 1700s, when surgical training moved to the universities - from which they were banned.

### ***Pare and new methods of surgery in the 1500s and 1600s***

From the 1500s to the middle of the 1600s surgeons experimented with new methods. Cauterising wounds was still popular and helped prevent infection, but some surgeons rejected these established methods in favour of more innovative approaches. In the mid-1500s Ambroise Paré, a French war surgeon, popularised the use of ligatures to control bleeding after amputation.

### ***The experience of surgery with newly found pain relief***

In the early 1800s the most important talents a surgeon could possess were speed and accuracy. Surgeons were famed for their speed, particularly in amputation. As there was still no effective anaesthetic, they had to perform their procedures quickly and were limited to external tumours, amputation and trephining. The development of new anaesthetic gases changed the experience of surgery for patient and surgeon. With the patient rendered unconscious, surgery could become more invasive and this also gave the surgeon the opportunity to be both slower and more methodical. The anaesthetic gas ether was first used in 1846 but was soon replaced by chloroform, which was originally used to relieve the pain of childbirth.

### ***Improved surgery in the 1940s***

By the beginning of the 1900s surgery was usually less painful and risky, but many patients continued to die from internal infection and blood loss. It was not until the development of safe blood transfusion and antibiotics such as penicillin in the early 1940s that surgery became relatively safe.

### ***Specialist surgeons***

X-rays also allowed surgeons to plan their surgery effectively by allowing them to see exactly what was wrong. Safer gases and intravenous anaesthetics replaced chloroform, and surgery became more specialised - surgeons spent many years studying a speciality, such as orthopaedics or cardiac surgery.

### ***Complex surgery from the 1900s***

As the 1900s progressed, surgery became more complex. Transplant and replacement surgery become relatively common. Elective surgery - non-life-saving procedures - is now performed regularly and some surgery has been developed principally for cosmetic purposes. Keyhole surgery and microsurgery are used increasingly to minimise exposure to infection and reduce the shock of surgery. While surgery has become safer, it remains a risky business.

Ilyina G.S *EL adviser*

## PROVISION OF SERVICES IN PALLIATIVE CARE

Shekera N., Kobylchenko M., *JIC-102*

What is the palliative care? Say “palliative care” and most people imagine cancer patients being made comfortable in an end-life hospice setting.

But palliative care is actually a new medical specialty that has emerged in the last decade and it’s not the same as hospice. It does not serve only the dying. Instead, it focuses more broadly on improving life and providing comfort to people of all ages with serious, chronic, and life-threatening illnesses.

Typically, a palliative care team includes a physician, nurse, and social worker. But it often involves a chaplain, psychologist or psychiatrist, physical or occupational therapist, dietitian, and others, depending on the patient’s needs.

While palliative care seem to offer a broad range of services, the goals of palliative treatment are concrete: relief from suffering, treatment of pain and other distressing symptoms, psychological and spiritual care, a support system to help the individual live as actively as possible, and a support system to sustain and rehabilitate the individual’s family.

With all its emphasis on the whole person – even one’s family and relationships, does palliative care truly improve quality of life?

When it comes to quality of life, each patient has his or her own vision. Each suffering is unique. Each individual is unique. There is no generalization and that’s the key. Palliative care is genuinely patient-centered, meaning: the team asks the patients what’s important to them and what their major priorities are. For some people, the goal or value might be to live as long as possible – no matter what the quality. Bases on what the patients or the family tell, the team develops a care plan and a strategy that meets the patients’ goals and values.

While some patients will want to discuss psychological or spiritual concerns and some will not, it is fundamentally important to assess each individual and their partners and families need for this type of support. Denying an individual and their support system an opportunity to explore psychological or spiritual concerns is just as harmful as forcing them to deal with issues they either don’t have or choose not to deal with.

I. M. Terletska, *EL adviser*

## STRICT LIABILITY

Fedorova O. – *group UM-03*

Some activities - such as using dynamite and storing flammable liquids - are considered to be extremely dangerous. For people who engage in activities like these, the reasonable person standard does not apply. Instead, these people are automatically held liable for any injuries or damage caused by their actions. They are liable even if they took all possible care to prevent the damage.

This form of liability is known as strict liability - liability for dangerous actions that involve no negligence or bad intent. It is sometimes called liability without fault.

Keeping dangerous animals is one common activity for which people may be held strictly liable. Under tort law, there are two categories of dangerous animals. The first is wild animals; the second is domestic animals that are known to be dangerous.

If you keep a wild animal, such as a lion or tiger, you are strictly liable. Even if you've trained the animal and take special care to keep it from injuring people, you must pay for any injuries the animal causes.

Domestic animals, such as dogs and cats, are usually not considered dangerous. However, if you know that your pet is dangerous - for example, if the animal has already bitten or injured someone - you are strictly liable for any further injury the animal causes. This rule is sometimes expressed as "every dog is allowed one bite." After your pet has bitten one person, you are liable for all future bites.

Other forms of strict liability have been imposed by state laws. For example, most states have child labor laws that try to discourage employers from hiring minors (people under a certain age, usually 18). Some of these laws make an employer strictly liable for injuries to a minor on the job - even if the employer did not cause the injury or didn't know the employee was a minor.

Dram shop laws also impose strict liability. A bartender is strictly liable for auto accidents caused by drunken customers even though he or she may be nowhere near the accident.

Pochatko T.V. – *EL Adviser*

## WHAT IS SWINE FLU

Bohma K., *JIC-005*

Swine flu is an illness that usually infects pigs (swine). It causes a respiratory ailment and is very contagious. Luckily it is rarely fatal. It circulates among pigs throughout the year, but it is most common during the late fall and winter, similar to the human flu season.

Typically, humans do not get swine flu. The virus that affected people in 2009 has mutated into a combination of swine, avian (bird) and human influenza and it has developed a capacity of passing from human to human. It is now known as pandemic H1N1 influenza.

The symptoms of H1N1 swine flu are similar to those of the seasonal flu and include fever, body aches, cough, sore throat, headache, fatigue, occasionally vomiting and diarrhea.

H1N1 swine flu is a virus just like any other strain of flu, but it does appear to respond to the antiviral medications Tamiflu and Relenza. These medicines do not cure the disease, but they may shorten the duration, make symptoms less severe or help you avoid it altogether if you are exposed.

There is an H1N1 swine flu vaccine that has been manufactured and began shipping to locations in Ukraine in November 2009. It is a separate vaccine and it has been extensively tested and found to be both safe and effective against the H1N1 swine flu virus.

Laboratory testing in Ukraine has confirmed pandemic H1N1 influenza virus in samples taken from patients in two of the most affected regions. As the pandemic virus has rapidly become the dominant influenza strain worldwide, it can be assumed that most cases of influenza in Ukraine are caused by the H1N1 virus.

We know for sure that sniffing, coughing, muscle and headache, photophobia and high body temperature is influenza (flu), a common disease. It is known to be relatively easy to treat but, nonetheless, it requires strict medical surveillance to avoid severe complication including pneumonia, meningitis, renal failure, otitis etc. This illness also demands self control and certain actions that everybody can afford.

One should also remember: it is impossible to get infected with H1N1 swine flu from eating pork or pork products. Swine flu is a respiratory virus and is not carried in the meat of animals. Properly cooked pork and pork products are safe to eat.

Mokhonyok Z.A. *EL advisor*



## LATIN AS THE LANGUAGE OF MEDICAL TERMINOLOGY

Shornikova Y.Y., *JIC-103*

The branches of science in which Latin has traditionally found its application involve indisputably medicine. The present paper offers an up-to-date view of the status of Latin as the language of medicine, namely in its terminological component. It is concerned in greater detail with the three basic terminological vocabularies in which a doctor cannot so far manage without its knowledge: anatomical, clinical and pharmaceutical. This is a brief survey, on the three most important corpuses of terminology and on the role which Latin plays in them at present.

A primary rank is occupied by anatomical nomenclature whose international version remains Latin in the full extent. All of the anatomical nomenclatures produced so far have used Latin as their base. When taking a cursory glance at the English anatomical nomenclature, one is likely to note that there is Latin present not only in the nominative plural of some of the nouns, e.g.: fascia – fasciae, sulcus – sulci, phenomenon – phenomena, datum – data, encephalon – encephala, but that there also occur nominative plurals of some adjectives, e.g.: chordae tendineae, foramina nervosa, rami communicantes.

A substantially more complicated image is provided by the terminology of the clinical disciplines. It is comprehensible because, first, its range is much larger (up to 60 thousand terms according to some estimates) and, second, there is a difference between the descriptive disciplines such as anatomy and histology on the one hand, and clinical medicine, which undergoes far more serious upheavals, on the other.

Some terms of Greek - Latin origin are presented in an English variation, i.e. mainly with Anglicized suffixes, e.g.: peptic ulcer, thromboembolic pulmonary hypertension, acute viral gastroenteropathy. Others are used by the English professional terminology in their original Latin wordings (naturally with an English pronunciation), e.g.: salpingitis, nephrolithiasis, colitis. But it becomes clear that the English medical terminology can't at all be reasonably mastered without the knowledge of basic Latin.

The causes of some diseases have namely been unknown as yet, and there even appear new diseases whose names are later subject to the development of opinions on their origin, therapy, and the like. But the roots and the stems that are used for the formation of the clinical terms remain Latin.

Clinical terms as well as terms relating to pathological anatomy may be encountered in medical literature, in the doctor's current practice when writing out case records, in diagnoses relating to pathological anatomy, and in normative handbooks of medical terminology. As far as the use of Latin terms is concerned, apart from some new expressions coming from English, they are still widely used for creating new words.

A third area where Latin has been traditionally preserved is represented by pharmaceutical and pharmacological terminology. In pharmaceutical terminology Latin has, for the time being, remained a functioning means of international communication, guaranteed by the European Pharmacopoeia (1996) and by the corpus of International Non-proprietary Names (1992, 1996).

Even though national languages have been favored in dispensing prescriptions in some of the countries of the European Union, in the central European area Latin has continued to be preferred and the standard international nomenclature of drugs and auxiliary substances has generally been based on the Latin version. The Latin version of the pharmacopoeia has, among other countries, been used in Germany, Switzerland, Yugoslavia, the countries of the former Soviet Union and, which is especially remarkable, also in Japan and China.

Apart from this, Latin and Greek constitute a unique stock which may also be drawn upon in case of the need of creating a new term. The incomprehensibility of the two languages for the patient is a specific moment of preference, as it is not always in his or her interest to understand the utterances of physicians. Thus the doctor speaks an incomprehensible language and, through a reversed logical process, the impression may arise that if somebody uses an incomprehensible terminology, she or he is a good doctor. We might designate this phenomenon as the mystery of the foreign-language medical communication.

Medical staff needs to know Geek - Latin terms to understand medical documentation property and for the communications between professional medical people. If you are familiar with the Latin roots, you can 'translate' the medical terminology and medical professional texts into English.

As follows from the preceding exposition, Latin has been so deep-rooted in medical terminology and thus also in medicine, and at the same time constantly so productive that its presence in it appears as a natural matter of course (though there do exist certain geographical variations in the individual areas).

Symonenko N.O., *ET adviser*

## POSSIBILITIES OF THE INTERNET

A.Y. Barybina – Sumy State

As I am a student of the IT- speciality, “Innovations in the World of Communicative Technologies” is a close theme to me. And this is up-to-date theme as every day we use computers and the Internet for entertainment, for example, watching films, reading books, playing computer games and for work. You can read scientific or simply interesting articles, exchange experience with other people who are specialists in your field. I think everyone has accounts on the Facebook, Twitter and other sites for communicating with people from different cities and even countries. So nowadays our lives are filled up with World Wide Web and social media. That is why scientists, computerniks, designers from all over the world try to make your sojourn in the computer reality more convenient and to some extend potential. As a result every day we have new devices, gadgets, programs and improvement of the ready-existing programs. So, I've chosen several examples, which shows us the most interesting and vivid innovations.

I would like to begin with the information about some very useful things for students. This is “LT Brush”. Everyone knows that students are very lazy. (This is also my experience☺). We can do everything at our lectures, but write no notes. Sometimes even the most diligent students don't like to write down information in their copybooks. The device, called “LT Brush” will be helpful for careless students. It can fix them up with ideal notes. This device was developed by a Chinese designer. It is supplied with a camera and an unusual scanner, which is able to scan information from the black board. So, having such device you can listen to the record of the lecture and be sure in your success at exams.

A pocket book is the next device in my list. This device affords reading books in an electronic variant. Nowadays real books from the libraries are not very popular. As you can get an electronic variant of every book you want: different authors, different genres. And you can take it with yourselves without any problems. The next advantage is portable. Usually a pocket book has a good screen and doesn't afford our eyes to get tired. This will be really useful device to you if you read a lot. As the prices on books are high, the pocket book is a good chance to you to save your money.

As for the next device we've heard a lot of fairytales, stories and legends. This is a magnetic invisible coat. Nowadays researches of the

invisibility and management of it are exceptionally claimed. Means of disguise are being improved every day. Not long ago the group of physicists and engineers demonstrated us working copies of invisible coats. With the help of them you can hide objects from light and sound. And the latest development is an antimagnetic coat, which protects objects from permanent geomagnetic field and doesn't break it. The designers of the invisible coat reported about their device in edition "New Journal of Physics". But these scientists need few months to get experimental confirmation.

In conclusion I'd like to say that the amazing growth of the Internet is going continue. The following predictions about the future of the Internet can be made:

1. You'll get more content via channels
2. You'll get more software via online distribution.
3. Streaming video and audio will become common.
4. Electronic commerce will become commonplace.
5. Pricing structure of the Internet access will change

V.E. Pronyaeva – *English language adviser*

## **CREDIT CARDS FOR CHILDREN**

Kononenko I., *F-92*

Are prepaid credit cards for children a good idea? It all depends on how you intend the card to be used. They can be a great convenience to parents and children alike, if they are used wisely. When kids reach a certain age, they start exerting their independence. They want to go to the mall with their friends instead of Mom and Dad. Before you know it, they are starting to drive, and need money for gas and other teen necessities. Unfortunately, kids get more expensive as they get older, and somehow a parent's pocket-change doesn't always keep up with their needs. So what can a parent do? One option is to use prepaid credit cards for children. These cards are similar to the gift cards issued by the major retailers, with the exception that their use is not restricted to just the issuing store. An example of this type of card is the The Mango™ MasterCard® Prepaid Card. Parents apply for a prepaid credit card in their child's name, and deposit money into the account to activate it. Children can then use their card anywhere Visa or MasterCard is accepted. When the card is used to make

a purchase, that amount is deducted from the card balance. When the card balance is low, parents can reload the card from their checking account or credit card.

#### Advantages of prepaid credit cards for children

1. They are more universally accepted than regular retail gift cards. They can be used anywhere Visa or MasterCard are accepted.
2. They are safer than cash. If the card is stolen or lost, call the credit card company to freeze the account so that it can't be used. The remaining money can be transferred to a new card.
3. Kids can make internet purchases without having to use their parent's credit cards.
4. It's convenient for those last-minute purchases when you're not available to give the kids cash.
5. Prepaid credit cards for children are safer than a regular credit cards or check cards because spending is limited to the amount loaded on the card. There are also no high interest rates or late fees associated with the card.

#### Disadvantages of prepaid credit cards for children

1. Some cards charge a one-time activation fee to cover the application process, account set-up, and shipping. Depending on the issuing bank, there may also be fees to load money on the card, and/or a monthly access fee to use the card.
2. If the card is used to get cash from an ATM, there will be an associated fee. Children need to be aware that this will lower their card balance. It is much better to just give your child cash instead of using the ATM to remove cash from the card.
3. If the card is loaded from a bank transfer, the money is usually not available for a couple of days.
4. Prepaid credit cards for children do not help build a credit history because account records are not reported to the credit bureaus.
5. If the parents don't teach their children the proper use of credit cards, it can lead to debt problems when they are old enough to get a real credit card.

Most prepaid credit cards for children offer the ability to track transactions online, but it is also a good idea to use a transaction register, which is similar to a check register. This allows a child to record all of the deposits and purchases to help keep track of how much money is currently available. Some cards, such as the Student UPSide Visa® Prepaid Card also offer educational material on their websites to help children learn the basics of budgeting and using their money wisely. Parents can also set spending limits and monitor the purchases through email or text alerts.

Kravchenko N.O., *EL Adviser*

## PRODUCTION OF ELECTRICITY FROM GRASS

A.G. Khalizeva – *group KM-91*

L.A. Denisova – *E L Adviser*

Today the problem of pollution of our environment is very important. That's why there are a lot of different sources of alternative energy. For example: solar energy, the energy of wind and water.

Production of electricity from grass is one of them. A lot of us have not even ever thought that electricity could be accumulated from the grass.

The use of microturbines plays the important role in this area of accumulation of energy. Microturbine is a small modular unit that produces electricity and heat that works on all types of fuel gas, including diesel fuel.

Nowadays not only microturbines are used. The pumps, engines, compressors, and other basic engineering objects are widely diffused in very peculiar branches of human life too. It includes medical sphere (micropumps), ecology (microturbines), etc.

Leaves and plants are solar natural batteries. The first step in the process of photosynthesis is the ability to convert sunlight into a small amount of electricity, as in the vital processes.

"Mango" is the invention of A.Miklosi – a vivid example of remarkable ingenuity. The tops of the leaves have solar cells for sunny days. Meanwhile when it rains, the shape of the leaves sends water to a water turbine, and it can gather energy from the moving water.

The other way of accumulation of energy is burning the biomass. For example, burning of elephant grass. Elephant grass is a plant that vaguely resembles sugarcane. It's easier on the soil: it grows on earth that's not rich in nutrients and it's not nearly as demanding as eucalyptus in terms of water.

One of the limitations is the process of producing electricity from elephant grass. This process still relies only on the thermal technology, burning the biomass, thus generating significant carbon emissions. Other alternatives for elephant grass are in early development stages, like the use of its bagasse, the fibrous residue that remains after the juice is extracted, to produce ethanol.<sup>[1]</sup>

Next years will be decisive for the understating of its full potential as a renewable fuel source, be it positive or negative.

This kind of production of electricity is a huge step up for our civilization.

[1] – [www.psfk.com](http://www.psfk.com)

## A DIGITAL LIFE

D.A. Borshchenko – *group KM-91*

L.A. Denisova - *EL Adviser*

Human memory can be maddeningly elusive. We stumble upon its limitations every day, when we forget a friend's telephone number, the name of a business contact or the title of a favorite book. People have developed a variety of strategies for combating forgetfulness, but important information continues to slip through the cracks.

Recently the team at Microsoft Research has begun a quest to digitally chronicle every aspect of a person's life. Digital memories can do more than simply assist the recollection of past events, conversations and projects. Portable sensors can take readings of things that are not even perceived by humans, such as oxygen levels in the blood or the amount of carbon dioxide in the air. Computers can then scan these data to identify patterns: they might determine which environmental conditions worsen a child's asthma. Sensors can also log the three billion or so heartbeats in a person's lifetime, along with other physiological indicators, and warn of a possible heart attack. This information would allow doctors to spot irregularities early, providing warnings before an illness becomes serious. Every word one has ever read, whether in an e-mail, an electronic document or on a Web site, can be found again with just a few keystrokes. Computers can analyze digital memories to help with time management, pointing out when you are not spending enough time on your highest priorities. Digital memories can enable all people to tell their life stories to their descendants in a compelling, detailed fashion.

The vision of machine-extended memory was first expounded at the end of World War II by Vannevar Bush, then director of the U.S. government office that controlled wartime research. Bush proposed a device called the Memex (short for "memory extender") - a microfilm-based machine that would store all of an individual's books, records and communications. The Memex was to be built into a desk and equipped with a keyboard, a microphone and several display surfaces. The person behind the desk could use a camera to make microfilm copies of photographs and papers or create new documents by writing on a touch-sensitive screen. One of the most prescient of Bush's ideas was the suggestion that the Memex should be designed to imitate the associative thinking of the human mind. Over the next half a century intrepid computer science pioneers developed

some of Bush's ideas, and the inventors of the World Wide Web borrowed the concept of the "web of trails" to build their system of linking sites. But the Memex itself remained technologically out of reach. In recent years rapid advances in storage, sensor and processor technologies have paved the way for new digital recording and retrieval systems that may ultimately go far beyond Bush's vision.

Manufacturers are producing a new generation of inexpensive sensors that may soon become ubiquitous. Some of these devices can record a wealth of information about the user's health and physical movements. Others can gauge the temperature, humidity, air pressure and light level in the surrounding environment and even detect the presence of warm bodies nearby. And microphones and cameras are now cheap enough to be installed virtually anywhere - particularly in cell phones. The dramatic increase in computing power over the past decade has led to the introduction of processors that can efficiently retrieve, analyze and visualize vast amounts of information.

The existent system requires more development to improve its ease of use and its management of the data. Better software for converting speech to text would greatly enhance the system by allowing users to search for words or phrases in phone conversations or other voice recordings. Automatic face recognition would solve the pesky problem of photograph labeling.

Some of the described scenarios are not all that futuristic. Wearable sensor platforms that collect health data and monitor vital signs such as heart rate, breathing and the number of calories burned are already being commercialized by some companies.

The era of digital memories is inevitable. Even those who recoil at our vision will have vastly more storage on their computers. Some may be frightened at the prospect of ubiquitous recording. Digital memories will yield benefits in a wide spectrum of areas, providing treasure troves of information about how people think and feel. By constantly monitoring the health of their patients, doctors may develop better treatments for heart disease, cancer and other illnesses. Scientists will be able to get a glimpse into the thought processes of their predecessors, and future historians will be able to examine the past in unprecedented detail. The opportunities are restricted only by our ability to imagine them.



## THE HISTORY OF CREDIT CARDS

Karayew D., *M-93*

As far back as the late 1800s, consumers and merchants exchanged goods through the concept of credit, using [credit coins and charge plates](#) as currency. It wasn't until about half a century ago that plastic payments as we know them today became a way of life. In the early 1900s, oil companies and department stores issued their own proprietary cards. Such cards were accepted only at the business that issued the card and in limited locations. While modern credit cards are mainly used for convenience, these predecessor cards were developed as a means of creating customer loyalty and improving customer service. The first bank card, named "Charg-It," was introduced in 1946 by John Biggins, a banker in Brooklyn. When a customer used it for a purchase, the bill was forwarded to Biggins' bank. The bank reimbursed the merchant and obtained payment from the customer. In 1951, the first bank credit card appeared in New York's Franklin National Bank for loan customers. It also could be used only by the bank's account holders. The Diners Club Card was the next step in credit cards. By 1951, there were 20,000 Diners Club cardholders. A decade later, the card was replaced with plastic. Diners Club Card purchases were made on credit, but it was technically a charge card, meaning the bill had to be paid in full at the end of each month. In 1958 the company emerged into the credit card industry with its own product, a purple charge card for travel and entertainment expenses. American Express introduced the first card made of plastic (previous cards were made of cardboard or celluloid). American Express soon introduced local currency credit cards in other countries. About 1 million cards were being used at about 85,000 establishments within the first five years, both in and out of the U.S. In the 1990s, the company expanded into an all-purpose card. American Express, or Amex as it often is called, is about to celebrate its 50th credit card anniversary. The Diners Club and American Express cards functioned in what is known as a 'closed-loop' system, made up of the consumer, the merchant and the issuer of the card. The general-purpose credit card was born in 1966, when the Bank of America established the BankAmerica Service Corporation that franchised the Bank American brand (later to be known as [Visa](#)) to banks nationwide. The ICA is now known as MasterCard Worldwide, though it was temporarily known as Master Charge. This organization competes directly with a similar Visa

program. The new bank card associations were different from their predecessors in that an 'open-loop' system was now created, requiring interbank cooperation and funds transfers. Visa and MasterCard still maintain "open-loop" systems, whereas American Express, Diners Club and Discover Card remain "closed-loop." Visa and MasterCard's organizations both issue credit cards through member banks and set and maintain the rules for processing. They are both run by board members who are mostly high-level executives from their member banking organizations. As the bank card industry grew, banks interested in issuing cards became members of either the Visa association or MasterCard association. Visa and MasterCard developed rules and standardized procedures for handling the bank card paper flow in order to reduce fraud and misuse of cards. The two associations also created international processing systems to handle the exchange of money and information and established an arbitration procedure to settle disputes between members. Although American Express was among the first companies to issue a charge card, it wasn't until 1987 that it issued a credit card allowing customers to pay over time rather than at the end of every month. Its original business model focused on the travel and entertainment charges made by business people, which involved significant revenue from merchants and annual membership fees from customers. Discover Card Services sought to create a new brand with its own merchant network, and the company has been successful at developing merchant acceptance. A 2004 antitrust court ruling against Visa and MasterCard - initiated by the U.S. government and the Department of Justice - changed the exclusive relationship that Visa and MasterCard enjoyed with banks. It allows banks and other card issuers to provide customers with American Express or Discover cards, in addition to a Visa or MasterCard. While the plastic card has been the standard for a half century, recent developments show alternative forms of payment rising to prominence, from online services such as PayPal to credit card key fobs to chips that can be implanted into cell phones or other devices. But with the sheer volume of devices in use around America whose sole purpose is to read a flat piece of plastic with a magnetic stripe, the "card" in "credit card" is unlikely to pass from the scene any time soon.

Kravchenko N.O., *EL adviser*

## BRIDGES. PROBLEMS AND SOLUTIONS

O.V. Orel – *group KM -91*

L.A. Denisova – *EL Adviser*

Engineers must consider many things – like the distance to be spanned and the types of materials available – before determining the size, shape, and overall look of a bridge. An incomplete structure is often subjected to stresses and oscillations that would not arise after completion.

Planning and executing the construction of a bridge is often very complicated, and in fact may be the most ingenious part of the entire enterprise.

Since ancient times, engineers have designed four major types of bridges to withstand all forces of nature: the beam bridge, the truss bridge, the arch bridge, and the suspension bridge. Five ingenious technological breakthroughs led us to the development in this area of construction of bridges.

The iron bridge. Darby's bridge was the first in the world to be made entirely of cast iron. The bridge's arch spans 100 feet and has five arch ribs, each cast in two halves.

The suspension bridge. These bridges in their simplest form were originally made from rope and wood. Modern suspension bridges use a box section roadway supported by high tensile strength cables. Also these bridges have a truss system beneath the roadway to resist bending and twisting.

Stronger chains. The main suspension cable in older bridges was often made from chain or linked bars, but modern bridge cables are made from multiple strands of wire. This contributes greater redundancy.

Building underwater. Where the towers are founded on underwater piers, caissons are sunk and any soft bottom is excavated for a foundation. If the bedrock is too deep to be exposed by excavation or the sinking of a caisson, pilings are driven to the bedrock or into overlying hard soil.

Wind. The open network of triangles makes the bridge very rigid, but it also allows the wind to blow right through the structure. In addition, engineers place several tuned mass dampers (TMDs) in each tower. The TMDs swing in the opposite direction of the wind sway.

Designs of bridges vary depending on the function of the bridge, the nature of the terrain where the bridge is constructed, the material used to make it and the funds available to build it.

In this way, it is one thing to design a bridge, but it is another thing to build it.

## IROBOT PACKBOT 510

V.Kaidash, *GM-91*

iRobot Corporation is an American advanced technology company founded in 1990 and incorporated in Delaware in 2000, the iRobot **Corporation** designs robots such as an autonomous home vacuum cleaner (Roomba), the Scooba that scrubs and cleans hard floors, and military and police robots, such as the PackBot. iRobot is a public corporation (NASDAQ: IRBT), based in Bedford, Massachusetts. **PackBot** is a series of military robots by iRobot. More than 2000 are currently on station in Iraq and Afghanistan, with hundreds more on the way. PackBots were the first robots to enter the damaged Fukushima nuclear plant after the 2011 Tōhoku earthquake and tsunami.

Current **PackBot 510** variants:

PackBot 510 is the current base model. It uses a videogame-style hand controller to make it more familiar to young operators. Configurations include:

PackBot 510 with EOD Bomb Disposal Kit designed for improvised explosive device identification and disposal.

PackBot 510 with Fast Tactical Maneuvering Kit designed for infantry troops tasked with improvised explosive device inspection. This is a lighter weight robot.

PackBot 510 with First Responder Kit designed to help SWAT teams and other first responders with situational awareness.

PackBot 510 with HazMat Detection Kit collects air samples to detect chemical and radiological agents.

PackBot 510 with Fido utilizes the Fido Explosives Detector from ICx Technologies as a payload in order to "sniff" out explosive materials. With the Fido, the PackBot now has the capability of locating explosive devices and subsequently disarming them using on-board robotic capabilities.<sup>[3]</sup>

PackBot 510 with REDOWL Sniper Detection Kit utilizes the Acoustic Direction Finder from BioMimetic Systems to localize gunshots with azimuth, elevation, and range.

510 PackBot for Infantry Troops easily adapts to the ever-changing requirements of bomb identification and other life-threatening infantry missions:

- Explosive Hazard Identification (EIDs/VBIEDs/ UXOs)
- Surveillance / Reconnaissance

- Route Clearance

510 PackBot for EOD Technicians quickly adapts to a variety of EID, conventional ordnance and SWAT missions^

- Bomb Disposal / EOD (IEDs/ VBIEDs/ UXO)
- Checkpoints / Inspections / Explosives Detection
- Route Clearance

510 PackBot for HazMat Technicians detects and identifies dangerous chemical, radiological and organic compounds, providing warfighters, first responders and SWAT teams with critical information on a range of missions:

- Hazardous Material Detection
- Surveillance / Reconnaissance
- Route Clearance
- Bomb Disposal / EOD (IEDs/ VBIEDs/ UXOs)

510 PackBot for First Responders provides SWAT teams, bomb squads, HAZMAT units and other emergency personnel with situational awareness in dangerous scenarios:

- SWAT / First Responders / Bomb Squads
- Bomb Disposal / EOD (IEDs/ VBIEDs/ UXO)
- Surveillance / Reconnaissance
- Checkpoints / Inspections / Explosives Detection

510 PackBot for Combat Engineers provides military and civil defense engineers with a single, advanced solution for multiple missions:

- Route Clearance
- Checkpoints / Inspections / Explosives Detection
- Explosive Hazard Identification (EIDs/VBIEDs/ UXOs)

Previous PackBot variants:

**Packbot Scout** is the basic configuration. It has five payload bays for assignable purposes and can be dropped from a height of six feet (1.83m) onto concrete without being damaged. The Packbot scout version weighs about 40 pounds (18 kg).

**PackBot Explorer** has a camera head equipped with multiple cameras, laser pointers, audio and other sensors.

**PackBot EOD** (explosive-ordnance disposal) can be controlled by radio or wired control to handle situations involving potential explosives, thereby reducing the risk of personal injury.

S. Zolotova, *ELA*

## ROBOTS DESIGNED TO SAVE PEOPLE'S LIVES

K. Beverkhiy, *IT-82*

D. Goriaynov, *IT-82*

Nowadays robots are the best human's helpers. They can do probably everything (apart from continuing the human race of course). You need to wash the dishes or do some louder? They can do that! You need to save someone's life? Yes, you guess right, this is also in their power to do.

When you have money to burn, robots are the best kind of first responders: the disposable kind. Bomb-squad bots are already a common tool for local law enforcement agencies and the military, but remote-controlled firefighters are just now making it into the field.

A team of robots built by London-based Qinetiq has recently started responding to a very specific threat: fires involving Acetylene gas. When (human) firefighters detect or even suspect the presence of these explosive cylinders in a blaze, they generally cordon off the area for up to 24 hours – then wait for the fireworks. But when the hazard zone covers a rail line, this can cause major train delays. So while it might not sound as heroic as plunging into a burning orphanage, a robotic solution could save money (thousands of dollars per hour, according to Qinetiq), and prevent human responders from walking into a potential bomb.

Over a test period of six months, Qinetiq has been commissioned to deploy a robo trio to Acetylene-related incidents. A Talon robot, like the ones used for Explosive Ordinance Disposal in Iraq, assesses the situation using thermal and video cameras. A much larger, construction-oriented bot, the 2160-pound Brokk 90 can then tear through walls or shove vehicles out the way. And if it looks like Acetylene cylinders are present, the ATV-size Black Max can use a high-pressure hose to douse the area. All of these robots are remote-operated, with no autonomous capabilities.

Not surprisingly, this isn't the robotics world's first shot at firefighting. Las Vegas-based InRob Tech has developed the 2070-pound FFR-1, a fire-resistant, remote-operated model that could respond to fires in confined spaces or hazardous environments, such as a chemical plant. However, InRob hasn't announced any orders for the FFR-1, and at press time, the company had not responded to e-mails or phone calls.

Another one example of useful vehicle is a robot that imitates the movement of cockroaches. Its latest version could potentially help find survivors in the ruins of an earthquake.

Called the dynamic autonomous sprawled hexapod, or DASH, the robots were designed to survive falls and unstable conditions. Recently researchers released an update which introduced “DASH + Wings”. The robot can move at 1.3 meters per second and climb 17 degree inclines.

You should hear about another useful for us kind of robots too – MIAMI (CBS4). American soldiers know when they go in to battle there is a chance they may not make it out alive. It’s these losses that have the military testing new technology. Robots will soon replace human medics.

It’s the future of battlefield medicine. Imagine a robot four wheeling its way through a cross fire to evacuate a wounded soldier, and think about that same robot assisting or in some cases replacing human medics on the ground.

Doctor Alex Bordetsky is leading a team of researcher in a series of field experiments at Camp Roberts in Monterey County, California.

“Saves lives, in a big way, I hope, because it saves time,” he said.

The team monitors the simulated battlefield’s condition and the soldier’s vital signs through prototype sensors in their uniforms. Robots deployed on the ground or as small helicopters are sent to find and help soldiers.

Thanks to advances in GPS and real time data feeds the robots already know which soldiers are the most seriously wounded, where they are and how to get there.

“Previously we would be controlling at every millisecond, the behavior of the mechanical device,” Bordetsky said. “Right now we are only sending wave points instead of just communicating everything through verbal descriptions between the unit members. They are getting picture, they’re getting data and a shared log of information.”

The information sent to doctors may allow them to diagnose and even begin treatments from afar. Doctors might some day trigger the injection of preloaded drugs through so called “nano patches”, which future soldiers would wear right next to their skin.

What you’re seeing is the ability to extend human capability outside of our hands and arms, and to rugged and remote environments,” said doctor Ray Buettner, director of Tactical Exercises. “Now technology is enabling us to be far from the doctor, sometimes thousands of miles from the doctor and still doing the things that make the difference between living and dying.

Although it’s now developed for the military, the technology could someday be used to save the lives of police officers and firefighters.

So, that is how they like, humans of future. Yes, they say that someday robots could literary replace us and live in their own way. But happily for now they just help us to live more comfortable and safe.

S. Zolotova, *ELA*

## PREDICTIONS AND ETHICS

A. Levchenko, S. Martunenko, *EP-91*

Artificial Intelligence is a common topic in both science fiction and projections about the future of technology and society. The existence of an artificial intelligence that rivals human intelligence raises difficult ethical issues, and the potential power of the technology inspires both hopes and fears.

In fiction, Artificial Intelligence has appeared fulfilling many roles, including a servant, a law enforcer, a comrade, a conqueror/overlord, a dictator, a benevolent provider/de facto ruler, an assassin, a sentient race an extension to human abilities and the savior of the human race.

Mary Shelley's *Frankenstein* considers a key issue in the ethics of artificial intelligence: if a machine can be created that has intelligence, could it also feel? If it can feel, does it have the same rights as a human? The idea also appears in modern science fiction, including the films *I Robot*, *Blade Runner* and *A.I.: Artificial Intelligence*, in which humanoid machines have the ability to feel human emotions. This issue, now known as "robot rights", is currently being considered by, for example, California's Institute for the Future, although many critics believe that the discussion is premature.

Joseph Weizenbaum wrote that AI applications can not, by definition, successfully simulate genuine human empathy and that the use of AI technology in fields such as customer service or psychotherapy was deeply misguided. Weizenbaum was also bothered that AI researchers (and some philosophers) were willing to view the human mind as nothing more than a computer program (a position now known as computationalism). To Weizenbaum these points suggest that AI research devalues human life.

Many futurists believe that artificial intelligence will ultimately transcend the limits of progress. Ray Kurzweil has used Moore's law (which describes the relentless exponential improvement in digital technology) to calculate that desktop computers will have the same processing power as human brains by the year 2029. He also predicts that by 2045 artificial intelligence will reach a point where it is able to improve itself at a rate that far exceeds anything conceivable in the past, a scenario that science fiction writer Vernor Vinge named the "singularity".

S. Zolotova, *ELA*



## WIFI ROBOT

O.O. Kovrigin, *SU-91*

Wifi Robot: A remote control car that can be driven over the internet or with a laptop (in future with smartphone based on Android) wirelessly from up to 500m away. It has a live-feed network camera so that it can be driven without line of sight and a horn so that you can honk at people (FPV).

Dron based on the Arduino microcontroller and dir320 router. Router very hacker-friendly in that it runs Linux and some of the hardware has been reverse engineered. A bunch of alternative firmware versions have been written for this router. The version that this project uses is the customizable Linux firmware Open-WRT.

The goal of this article is to give a high-level overview of the project and provide some implementation details of the software and electronics.

The WiFi control package interface program utilized a VB.net program in which we provide the source code. The program will control and monitor the robot via a RS232 connection. In the case of a WiFi robot, the RS232 connection is a virtual serial port connection. The control program interfaces with a custom control board that is programmed to match your robot's specifics such as motor controllers, encoders, sensors, relays, current monitoring, voltages, etc.

Developed a program for the microcontroller, to pc, is being developed for Android. Assembly is held firmware for the router.

Terms of mechanics, was soldered uart2com converter, voltage regulator, was held electronics soldering machine for use as motor drivers.

Using a simple r/c car with adding a network camera, router, heavier batteries, extra circuits, microcontrollers, we are solving problem with developing separate moving platform for our robot.

Price of a finished similar device in the store is close to \$400. My project costs close to \$100

Top Speed of a car is 15.5km/h.

This device can be used for many purposes. The robot can be used as a spy, a scout, as a field engineer (after create robot hand)

A.M. Dyadechko, *ELA*

## ROCR

I. Nikulin, *SU-91*

A new robot with two claws and a tail that sways like a pendulum is the first robot designed to move efficiently like human rock climbers or apes swinging through trees. This small robot, named ROCR (pronounced "rocker"), can scramble up a carpeted, eight-foot wall in just over 15 seconds. A robot of this design could eventually be used for inspection, maintenance and surveillance, according to its makers, or it can be a really cool toy for children.

Developer of this robot is William Provancher, an assistant professor of mechanical engineering at the University of Utah.

While prior climbing robots have focused on issues such as speed, adhering to the wall, and deciding how and where to move, ROCR is the first to focus on climbing efficiently," Provancher said.

One previous climbing robot has ascended about four times faster than ROCR, which can climb at 15.7 centimeters per second, but ROCR achieved 20 percent efficiency in climbing tests, "which is relatively impressive given that a car's engine is approximately 25 percent efficient," Provancher said. The robot's efficiency is defined as the ratio of work performed in the act of climbing to the electrical energy consumed by the robot.

Previous climbing robots have been large, with two to eight legs. ROCR, in contrast, is small and lightweight: only 31 centimeters wide, 46 centimeters long from top to bottom and weighing only 0.54 kilogram.

Provancher said the study is the first to set a benchmark for the efficiency of climbing robots against which future models may be compared. He said future work will include improving the robot's design, integrating more complex mechanisms for gripping to walls of various sorts, such as brick and sandstone, and investigating more complex ways of controlling the robot – all aimed at improving efficiency. "Higher climbing efficiencies will extend the battery life of a self-contained, autonomous robot and expand the variety of tasks the robot can perform," Provancher said.

A.M. Dyadchko, *ELA*

## ROBOTS

Nagorniy Sergiy, *EP-91*

A **robot** is a mechanical or virtual intelligent agent that can perform tasks automatically or with guidance, typically by remote control. In practice a robot is usually an electro-mechanical machine that is guided by computer and electronic programming. Robots can be autonomous, semi-autonomous or remotely controlled. Robots range from humanoids such as ASIMO and TOPIO to Nano robots, Swarm robots, Industrial robots, military robots, mobile and servicing robots. By mimicking a lifelike appearance or automating movements, a robot may convey a sense that it has intent or agency of its own. The branch of technology that deals with robots is robotics.

Mobile robots have the capability to move around in their environment and are not fixed to one physical location. An example of a mobile robot that is in common use today is the *automated guided vehicle* or *automatic guided vehicle* (AGV). An AGV is a mobile robot that follows markers or wires in the floor, or uses vision or lasers. AGVs are discussed later in this article.

Mobile robots are also found in industry, military and security environments. They also appear as consumer products, for entertainment or to perform certain tasks like vacuum cleaning. Mobile robots are the focus of a great deal of current research and almost every major university has one or more labs that focus on mobile robot research.

Modern robots are usually used in tightly controlled environments such as on assembly lines because they have difficulty responding to unexpected interference. Because of this most humans rarely encounter robots. However domestic robots for cleaning and maintenance are increasingly common in and around homes in developed countries. Robots can also be found in military applications.

Most commonly industrial robots are fixed robotic arms and manipulators used primarily for production and distribution of goods. The term "service robot" is less well-defined. IFR has proposed a tentative definition, "A service robot is a robot which operates semi- or fully autonomously to perform services useful to the well-being of humans and equipment, excluding manufacturing operations."

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Industrial robots usually consist of a jointed arm (multi-linked manipulator) and an end effector that is attached to a fixed surface. One of the most common type of end effector is a gripper assembly.

The International Organization for Standardization gives a definition of a manipulating industrial robot in ISO 8373: "an automatically controlled, reprogrammable, multipurpose, manipulator programmable in three or more axes, which may be either fixed in place or mobile for use in industrial automation applications."

This definition is used by the International Federation of Robotics, the European Robotics Research Network (EURON) and many national standards committees.

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Modular robots is a new breed of robots that are designed to increase the utilization of the robots by modularizing the robots. The functionality and effectiveness of a modular robot is easier to increase compared to conventional robots.

Some experts and academics have questioned the use of robots for military combat, especially when such robots are given some degree of autonomous functions. There are also concerns about technology which might allow some armed robots to be controlled mainly by other robots. The US Navy has funded a report which indicates that as military robots become more complex, there should be greater attention to implications of their ability to make autonomous decisions. One researcher states that autonomous robots might be more humane, as they could make decisions more effectively. However, other experts question this.

S. Zolotova, *ELA*

## ADVANCED STEP IN INNOVATIVE MOBILITY

A. Karikh, *GM-91*

**ASIMO** is a [humanoid robot](#) created by [Honda](#). Introduced in 2000, ASIMO, which is an acronym for "Advanced Step in Innovative **MO**bility", was created to be a helper to people. With aspirations of helping people who lack full mobility, ASIMO is used to encourage young people to study science and mathematics. The robot has made public appearances around the world, including the [Consumer Electronics Show](#) (CES), the [Miraikan](#) Museum in [Japan](#) and the [Ars Electronica](#) festival in [Austria](#).

Honda began developing humanoid robots in the 1980s, including several prototypes that preceded ASIMO. It was the company's goal to create a walking robot which could not only adapt and interact in human situations, but also improve the quality of life.

The research conducted on the E- and P-series led to the creation of ASIMO. Development began at Honda's *Wako Fundamental Technical Research Center* in [Japan](#) in 1999 and ASIMO was unveiled in October 2000.

Introduced in 2000, the first version of ASIMO was designed to function in a human environment, which would enable it to better assist people in real-world situations. Since then, several updated models have been produced to improve upon its original abilities of carrying out mobility assistance tasks. A new ASIMO was introduced in 2005, with an increased running speed to 3.7 mph, which is twice as fast as the original robot.

**Form.** ASIMO stands 4 feet 3 inches (130 cm) tall and weighs 119 pounds (54kg). Research conducted by Honda found that the ideal height for a robot was between 120 cm and the height of an average adult, which is conducive to operating door knobs and light switches. ASIMO is powered by a re-chargeable 51.8V lithium ion battery with an operating time of one hour. Switching from a nickel metal hydride in 2004 increased the amount of time ASIMO can operate before recharging. ASIMO has a three-dimensional computer processor that was created by Honda and consists of a three stacked die, a processor, a signal converter and memory. The computer that controls ASIMO's movement is housed in the robot's waist area and can be controlled by a PC, wireless controller or voice commands.

**Abilities.** ASIMO has the ability to recognize moving objects, postures, gestures, its surrounding environment, sounds and faces, which enables it to interact with humans. The robot interprets voice commands and human hand movements, enabling it to recognize when a handshake is offered or when a person waves or points, and then respond accordingly. ASIMO responds to questions by nodding or providing a verbal answer and can recognize approximately 10 different faces and address them by name.

**Mobility.** ASIMO can adjust the length of its steps, body position, speed and the direction in which it is stepping. Its arms, hands, legs, waist and neck also have varying degrees of movement. ASIMO has a total of 34 degrees of freedom. The neck, shoulder, wrist and hip joints each have three degrees of freedom, while each hand has four fingers and a thumb that have two degrees of freedom. Each ankle has two degrees of freedom, and the waist, knees and elbows each have one degree of freedom.

TOKYO, Japan, November 8, 2011 - Honda Motor Co., Ltd. today unveiled an all-new ASIMO humanoid robot newly equipped with the world's first autonomous behavior control technology. With a further advance in autonomy, the all-new ASIMO can now continue moving without being controlled by an operator. Moreover, with significantly improved intelligence and the physical ability to adapt to situations, ASIMO took another step closer to practical use in an office or a public space where many people come and go.

**Improved task-performing capability.** Honda has developed a highly functional compact multi-fingered hand, which has a tactile sensor and a force sensor imbedded on the palm and in each finger, respectively, and which acts to control each finger independently. Combined with the object recognition technology based on visual and tactile senses, this multi-fingered hand enables the all-new ASIMO to perform tasks with dexterity, such as picking up a glass bottle and twisting off the cap, or holding a soft paper cup to pour a liquid without squishing it. Moreover, ASIMO is now capable of making sign language expressions which require the complex movement of fingers.

**Key specifications of the all-new ASIMO are:**

1. Height 130cm.
2. Weight 48kg (decreased 6kg from previous model).
3. Operating degrees of freedom Total: 57 degrees of freedom (increase of 23 degrees of freedom from previous model).
4. Running speed 9km/hour (previous model: 6km/hour)

S. Zolotova, *ELA*

# GLOBALIZATION

Chayka T., F-92

Your shirt was made in Mexico and your shoes in China. Your CD player comes from Japan. You can travel to Moscow and eat a Big Mac there and you can watch an American film in Rome. Today goods are made and sold all over the world, thanks to globalization.

Globalization lets countries move closer to each other. People, companies and organizations in different countries can live and work together. We can **exchange goods** , money and ideas faster and cheaper than ever before. Modern communication and technology, like the **Internet**, cell phones or satellite TV help us in our daily lives.

Globalization is growing quickly. A German company can produce **cars** in Argentina and then sell them in the United States. A businessman in Great Britain can buy a part of a company in Indonesia on one day and sell parts of another business in China the next, thanks to globalization. Fast food companies open shops around the world almost every day.

## History of Globalization

Globalization is not new. For thousands of years people have been trading goods and travelling across great distances. During the **Middle Ages**, merchants travelled along the Silk Road, which connected Europe and China.

The modern age of globalization started with the **Industrial Revolution** at the end of the 18th century. New machines were able to produce cheaper goods. Trains and steam-powered boats transported products farther and faster.

Since 1980, globalization has been moving at a faster pace. Today it is easier for companies to work in other countries. The Internet gives them the chance of reaching more customers around the world. Teleworkers work for firms that may be far away.

However , there is a growing debate over globalization. Governments are in favour of globalization because the economy can grow. Other people are not so sure that there are only advantages. Here are some arguments from both sides:

### **Good sides:**

- globalization lets countries do what they can do best. If, for example, you buy cheap steel from another country you don't have

to make your own steel. You can focus on computers or other things;

- globalization gives you a larger market. You can sell more goods and make more money. You can create more jobs;
- consumers also profit from globalization. Products become cheaper and you can get new goods more quickly.

### **Bad sides :**

- globalization causes unemployment in industrialized countries because firms move their factories to places where they can get cheaper workers;
- globalization may lead to more environmental problems. A company may want to build factories in other countries because environmental laws are not as strict as they are at home. Poor countries in the Third World may have to cut down more trees so that they can sell wood to richer countries;
- globalization can lead to financial problems . In the 1970s and 80s countries like Mexico, Thailand, Indonesia or Brazil got a lot of money from investors who hoped they could build up new businesses there. These new companies often didn't work, so they had to close down and investors pulled out their money;
- some of the poorest countries in the world, especially in Africa, may get even poorer. Their population is not as educated as in developed countries and they don't have the new technology that we do;
- human, animal and plant diseases can spread more quickly through globalization.

Many experts say that we need a different kind of globalization in our world today. There must be ways to make sure that all countries profit from the good sides of globalization. We should help poorer countries by giving them better education and showing them how new technology works.

Every year leaders of the world's biggest industrial countries get together to discuss economic problems. This meeting is called the G8 summit. In the last few years groups against globalization have organized protest marches and demonstrations to point out that not everyone is happy with how the world's economy is developing.

N. O. Kravchenko – *EL adviser*



## INTANGIBLE METHODS OF STAFF MOTIVATION

Student N. Vedmid, *M-91*

E. Adviser I. A. Morozova

The main job of a manager is to get things done through employees. To do this a manager should be able to motivate employees. But that is easier said than done! To understand motivation means to understand human nature itself, but human nature can be very simple, but very complex too. An understanding and appreciation of this is a prerequisite to effective employee motivation in the workplace, and therefore, effective management and leadership. It is believed that the best way to motivate staff is to increase their wages. Is it really so? Is the key to effective work of employees so easy to find? Let's check it and try to find alternative ways of staff motivation!

In 2009 Russian sociologists have carried out a survey of 1500 employees from different companies about most effective methods of staff motivation. The survey did not include ready-made answers, respectively, participants of a survey could write all the factors that motivate them to work. The following question was asked: "What motivates (stimulates) you on the job and what can motivate you in the future?"

Here are the factors that were most often mentioned by participants. In the first place are the factors referred more than any others:

- the positive evaluation of the work by employees;
- respect for and appreciation of my work with the leadership;
- respected, appropriate authorities, acceptance of domestic politics and values of company;
- the level of responsibility and tasks; autonomy and independence;
- compensation package and stable wages.

As you can see, the wage is not in the first place, but it is in the list of most frequently mentioned factors. First place is occupied intangible values in the above proposed rating. American economist Bob Nelson offers the following methods of intangible incentives of workers, which he calls "The Power of "I am"":

Interesting work. A management theorist Frederick Herzberg once said, "If you want someone to do a good job, give them a good job to do". While some jobs may be inherently boring, you can provide employees with at least one stimulating task or project. Name them a suggestion committee that meets weekly, or some other special group. The increased productivity will compensate the cost of their extracurricular work.

Information, communication and feedback. As previously pointed out, now more than ever employees want information. They crave knowledge about

how they are doing in their jobs and how the company is doing in its business. Start telling them how the company makes and spends money. Soon you will have them turning out the lights when they are the last to leave the room.

Involvement in decisions, ownership. Involving employees, especially in decisions that affect them, is both respectful to them and practical. People who are the closest to the problem or customers typically have the best insight on how to improve a situation. They know what works and what doesn't, but you rarely ask them for their opinion. If you involve others, you will improve their commitment and increase the ease in implementing changes.

Independence, autonomy and flexibility. Most employees value the freedom in the implementation of their job as they see fit. However, all employees value flexibility in their job. If you provide these characteristics to employees, and explain to them the desired performance, it will increase the likelihood that they will perform as desired. Even with new employees, you can provide work assignments in a way that tells them what needs to be done without dictating exactly how to do it.

Recognition and opportunity. For some workers providing them with recognition is a public way of giving them credit of confidence for their work. This can be achieved in many ways, such as issuance of letters of praise, thanks for good work, putting his or her picture on a "wall of fame" in your company and so forth. Likewise, a new assignment or additional responsibilities extended as recognition for past performance also motivates most employees.

In addition to the types of no-cost recognition that can be built into an individual job, management should also administer low-cost rewards designed to encourage employees to success. To heighten their effectiveness, these intangible rewards should be granted frequently and should be personal and creative.

There are many ways to motivate employees by non-monetary incentives. Encouraging employees to do their best through praise and recognition is the easiest way to motivate them. When people love what they do, they will consistently perform at their top level. But it does not mean that you have to forget about the financial reward. Only different types of methods of staff motivation in combination give the best results for the successful development of a company.

## BANKING SYSTEM OF UKRAINE

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The current banking system in Ukraine is two-tiered, comprising the central bank of the country and commercial banks. The central bank of Ukraine is the National Bank of Ukraine (NBU). It controls the national currency, supervises the banking system and issues current banking regulations. Commercial banks operate under the authorization and supervision of the NBU.

The National Bank of Ukraine is the central bank of Ukraine, the main responsibility of the bank is providing stability of the Ukrainian national currency, the hryvnia (UAH), assisting in implementing the united state policy in the sphere of money turnover.

The highest governing body of the NBU is the 15-member Council. Seven members are appointed by the Verkhovna Rada and seven by the President. The Bank Governor, who is nominated by the President and appointed by the Rada, acts *ex officio* as the 15<sup>th</sup> member. The Council develops the principles underlying the country's monetary policy.

The main functions of the National Bank of Ukraine: the National Bank of Ukraine is the central bank, which pursues comprehensive state policy in the domain of monetary circulation, crediting and providing stability of the national monetary unit. It is, at the same time, the money issuer, the body of currency regulation, the body of bank supervision, the bank of banks, the state bank, and the organizer of inter-bank settlements.

Being the central bank of the state, the NBU pursues monetary-credit policy, establishing and applying appropriate instruments. It represents the interests of Ukraine in relations with the central banks of other countries, international banks, and financial-credit organizations. The National Bank of Ukraine enjoys the monopolistic right to issue money into circulation, as well as to issue national monetary marks (bank-notes, coins).

Commercial banks are formed as joint-stock companies or as companies on an equal footing with both legal and natural persons involved. The range of commercial banks activities includes: receiving deposits of enterprises, institutions and households, crediting of economic entities and households, investments in securities, formation of cash balance and reserves, as well as other assets, cash and settlement servicing of the economy, foreign exchange operations and other services to natural persons and legal bodies. Numerous Ukrainian commercial banks have joined the Society for Worldwide Interbank Financial Telecommunications (SWIFT).

## CREDIT CARDS OF THE FUTURE

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Credit Cards are an important part of our lives - they help to transfer, carry and exchange money safely and easily. But let's face it - most credit cards are limited in features. They are completely useless without a compatible machine such as an ATM.

The credit card of the future, conceptualized by Jacob Palmborg, aims to change this - it packs enough technology and features to surpass most commercial devices today. It includes touchscreen interface, real time data and biometric security.

The appearance of this credit card is like no other- instead of just being a solid hunk of plastic, the card consists of a thin touchscreen. On the screen, data such as your account balance and recent purchases are displayed. This allows continuous awareness of all aspects of your account - no ATM is needed. Any changes to your account can be made with just a few swipes and a little navigation on the screen. In addition, the credit card is linked to all your accounts- allowing you to use it as any one of your multiple credit cards.

The card is protected through biometrics- as it recognizes body features such as fingerprints. This obviously gives enhanced security without increasing complexity as everything is automatic. At the touch of an unauthorized person, the card immediately shuts down keeping data and your account safe. And as additional security, no data is actually stored on the credit card itself, but rather it streams data off a server. Meaning if ever to get in the wrong hands, the card can be immediately disabled preventing the person from accessing any data.

To help the visually impaired carry out day-to-day activities just like others, designers are coming up with new innovative products. The latest one by Kwon Ki Nam is the Credit Card for the Blind. When a blind person uses his credit card, there is no way for him to check the payment amount. Also, after the card is swiped over the card reader, it requires the car owner's signature, which becomes quite impossible for the visually impaired. However, the Credit Card for the Blind makes use of fingerprint recognition technology, which serves as a security device and does not necessitate a signature. The payment sum is displayed over the card with Braille. To help blind people recognize the payment amount, a voice recording is broadcasted from a small speaker, delineating the products that are purchased. With no hassle, the visually impaired can use credit card and have an enjoyable shopping.

## VIBRATION ANALYSIS FOR ROTATING MACHINES

A. Zhulyov, *KM-81*

The most commonly used method of identification failures for rotating machines is called vibration analysis. Measurements can be taken on machine bearing casings with seismic or piezo-electric transducers to measure the casing vibrations, and on the vast majority of critical machines, with eddy-current transducers that directly observe the rotating shafts to measure the radial (and axial) vibration of the shaft. The level of vibration can be compared with historical baseline values such as former startups and shutdowns, and in some cases established standards such as load changes, to assess the severity.

Interpreting the vibration signal obtained is a complex process that requires specialized training and experience. Exceptions are state-of-the-art technologies that provide the vast majority of data analysis automatically and provide information instead of data. One commonly employed technique is to examine the individual frequencies present in the signal. These frequencies correspond to certain mechanical components (for example, the various pieces that make up a rolling-element bearing) or certain malfunctions (such as shaft unbalance or misalignment). By examining these frequencies and their harmonics, the analyst can often identify the location and type of problem, and sometimes the root cause as well. For example, high vibration at the frequency corresponding to the speed of rotation is most often due to residual imbalance and is corrected by balancing the machine. As another example, a degrading rolling-element bearing will usually exhibit increasing vibration signals at specific frequencies as it wears. Special analysis instruments can detect this wear weeks or even months before failure, giving ample warning to schedule replacement before a failure which could cause a much longer down-time. Beside all sensors and data analysis it is important to keep in mind that more than 80% of all complex mechanical equipment fail accidentally and without any relation to their life-cycle period.

Most vibration analysis instruments today utilize a Fast Fourier Transform (FFT) which is a special case of the generalized Discrete Fourier Transform and converts the vibration signal from its time domain representation to its equivalent frequency domain representation. However, frequency analysis (sometimes called Spectral Analysis or Vibration Signature Analysis) is only one aspect of interpreting the information contained in a vibration signal. Frequency analysis tends to be

most useful on machines that employ rolling element bearings and whose main failure modes tend to be the degradation of those bearings, which typically exhibit an increase in characteristic frequencies associated with the bearing geometries and constructions. In contrast, depending on the type of machine, its typical malfunctions, the bearing types employed, rotational speeds, and other factors, the skilled analyst will often need to utilize additional diagnostic tools, such as examining the time domain signal, the phase relationship between vibration components and a timing mark on the machine shaft, historical trends of vibration levels, the shape of vibration, and numerous other aspects of the signal along with other information from the process such as load, bearing temperatures, flow rates, valve positions and pressures to provide an accurate diagnosis. This is particularly true of machines that use fluid bearings rather than rolling-element bearings. To enable them to look at this data in a more simplified form vibration analysts or machinery diagnostic engineers have adopted a number of mathematical plots to show machine problems and running characteristics.

Handheld data collectors and analyzers are now commonplace on non-critical or balance of plant machines on which permanent on-line vibration instrumentation cannot be economically justified. The technician can collect data samples from a number of machines, then download the data into a computer where the analyst or artificial intelligence can examine the data for changes indicative of malfunctions and impending failures. For larger, more critical machines where safety implications, production interruptions, replacement parts, and other costs of failure can be appreciable, a permanent monitoring system is typically employed rather than relying on periodic handheld data collection. However, the diagnostic methods and tools available from either approach are generally the same.

Performance monitoring is a less well-known condition monitoring technique. It can be applied to rotating machinery such as pumps and turbines, as well as stationary items such as boilers and heat exchangers. Measurements are required of physical quantities: temperature, pressure, flow, speed, displacement, according to the plant item. Absolute accuracy is rarely necessary, but repeatable data is needed. Performance analysis is often closely related to energy efficiency, and therefore has long been applied in steam power generation plants.

To draw the conclusion, one can say that vibration analysis is the most widespread and versatile method of diagnostics for rotating equipment. Therefore it has a big field for further investigation.

A. Dyadechko, *ELA*

## **BIOMETRIC AUTHENTICATION TECHNOLOGY: FROM THE MOVIES TO YOUR DESKTOP**

Y. Danechkina, K. Makarian, *IN-82*

Passwords and personal identification numbers (PIN) are information that we need to remember since the day we started interacting with digital systems. Some of these passwords also known as passphrase are long to remember that we need to come up with a pattern to create such passwords. We sometimes rely on tools such as a sticky, PDA or text file to store these lists of passwords.

Would it be easy to identify yourself as if you are been seen by another individual acknowledging their acquaintance with you? That's exactly what a biometric authentication technology does.

Biometrics are automated methods of identifying a person or verifying the identity of a person based on a physiological or behavioral characteristic. Examples of physiological characteristics include hand or finger images, facial characteristics, and iris recognition. Behavioral characteristics are traits that are learned or acquired. Dynamic signature verification, speaker verification, and keystroke dynamics are examples of behavioral characteristics.

The National Institute of Standards and Technology (NIST) partners with virtually every agency in the Government that uses large biometric systems to assist with their mission. This includes:

1. DHS
2. DOJ/FBI
3. DOD
4. DOS
5. Intelligence Community

Why are biometrics important? Biometrics are used to:

1. Secure facilities.
2. Protect access to computer networks.
3. Counter fraud.
4. Screen people at our borders.
5. And fight crime.

Biometrics are used to manage identities for:

1. First responders at the scene of a natural disaster.
2. Border patrol.
3. Soldiers in theater.
4. And police officers on the street.

S. Zolotova, *ELA*

## PRODUCING ENERGY IS SIMPLE

D. Skorodied, *EM-81*

During the past decade, the world began to study one of the global challenges of the XXI century - the development of new energy-saving technologies for using non-conventional renewable energy sources. Existing energy sources can not provide a query of the total population of the globe. Moreover, energy-saving technologies should be viewed not only globally but also at the individual level. We don't have to look far for examples.

The heat of the human body is not a resource that comes to mind when we talk about reducing the ever-increasing heating costs. As it turns out, human warmth has great energy potential. Railway stations, clubs, supermarkets - places with large concentrations of people can be provided with the heat exchangers in the ventilation system. Excess heat of human bodies converts into hot water, which is then pumped into the heating system of a neighboring building. The system not only pleases with its environmental performance, but also with the economic feasibility of its use, since it allows to reduce heating costs by 25%. It is more profitable to spend a small amount of electricity needed to transform and redirect the heat than to invest heavily in natural gas heating.

Recently a technology that converts mechanical energy of human walking into electrical energy was presented. Paving stone absorbs the kinetic energy which is transferred from steps to the surface, and generates about 2,1 kW/h. All the energy of the steps directs to the lithium-polymer battery, and then is used in the required order (lighting of the bus stop at night, feeding information displays). Return on investment will take about a year. The service life of the board is 5 years or 20 million steps. This "buttons" are made of recycled materials. The top cover is made from old tires.

For energy-saving, anything that is around the person can be used, even public transport. Anyone who lives next to the railway, confirms that going on the high speed trains, especially freight, raise the wind, which contains a sufficient amount of energy. For this purpose, there is modern system of turbines, installed between the railway sleepers, which generates electricity at the time when the train passes above them. By installing the system on the railroad or subway, we can use the energy potential of the resource, which is now wasted. The system does not depend on the non-permanent natural sources of energy, it uses a source that is a byproduct of human activity.



Another energy-saving setting is a generator of electricity, which is used in the handrails, for which passengers are kept while traveling in public transport. The process of obtaining energy is carried out by the use of piezoelectric ceramics - all the energy stored in this way, is transmitted to the board system of the bus. And only then, each passenger can plug into an outlet whatever he wants.

Even while you are on vacation, you may not notice how things that surround you, produce electricity using alternative energy sources. Scientists have developed solar cells that are embedded into parasol. So the creative umbrella will be useful to charge any device while you are lying on the beach.

The original solution of energy problems of mobile devices in urban areas was solved by an alternative vertical windmill, capable of operating in either direction of the wind, and specially designed for installation in city parks, beaches, bus stops and other public places. The wide base of the windmill can be used as a comfortable bench. Despite the fact that wind energy is one of the main sources of renewable energy, it all comes down to the giant windmills, unsuitable for use in urban settings: too bulky, too noisy, and the appearance is poor. The only advantage of these wind monsters - the development of large amounts of electricity. Small compact wind turbines are less efficient, but more friendly to man. They can be safely used in urban and home environments, which makes wind energy more affordable for the average person.

You can have your personal unusual devices for saving and producing energy in your own house. For example, there is an unusual way to recharge laptops. Energy that is produced in collisions of fingers on the keyboard device can be used for this purpose. The developers propose to cover the keys with the very thin membrane made of piezoelectric - a material that is capable of converting mechanical energy into electrical energy. In this case, the mechanical energy from the impact of the key can be turned into electricity, and engaged to supply the batteries. To implement the idea into practice, you must create a piezoelectric membrane, the thickness of which would be measured in nanometers. It may be applied not only to laptops, but also in other mobile devices - such as smartphones with touch screen.

Surprising, that simple curtains can transform solar energy into electricity. You can design a house with curtains, which contain photovoltaic cells and get about 16 kW/h with their use. The project uses photovoltaic fabric produced from organic materials. Unlike conventional solar panels, they can be easily modified and pressed.

Instead of mindlessly taking away the last wealth of our planet, we must learn to apply all around us energy diversity with benefit.

A. Dyadechko, *ELA*

## SOLAR PAINT - AN INNOVATIVE SOURCE OF CHEAP ENERGY

N. Hordiiko, *EM-81*

The greenest of modern homes already have solar panels on their roofs, but there may soon be a simpler way to harvest solar energy. Imagine if the next coat of paint you put on the outside of your home generates electricity from light—electricity that can be used to power the appliances and equipment on the inside. Researchers at the University of Notre Dame have invented solar paint, a compound that can absorb the sun's energy and transfer it to your home.

The solar paint's secret is the use of quantum dots, which are power-producing nano-particles. In this case, that was titanium dioxide coated with either cadmium sulfide or cadmium selenide. The quantum dots are suspended in a water-alcohol mixture and made into a spreadable compound. It can then be spread — in one coat — onto any conductive surface, collecting energy without any special equipment.

Unfortunately, the solar paint isn't quite ready for prime time. The typical light-to-energy conversion efficiency in commercial solar cells is 10 to 15 percent. Solar paint is, at present moment, only yielding a 1 percent conversion. The researchers, however, believe that if they can get the efficiency cranked up just a little higher, it will be a viable solution. As it can be made cheaply and liberally, solar paint could get away with having lower than standard conversion efficiencies. While it still sounds like it's years away from commercial use, the solar paint has loads of potential. If a house has a roof and walls that are covered in solar paint, it could complement traditional power sources to help reduce costs and indirectly contribute to environmental conservation. Solar panels will probably always be more efficient, but the simplicity, low cost, and unobtrusiveness of solar paint could lead to more widespread adoption.

If the idea of solar colors run into mass production, this significantly reduce energy costs. Thus, we not only save money but also improve the ecological situation on the planet. Energy saving is now an integral part of our lives, because our resources are not unlimited, and who knows what legacy we will leave to future generations.

A. Dyadchko, *ELA*

## TIME-MANAGEMENT

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Concentrate on results, not on being busy.

Time management is the act or process of exercising conscious control over the amount of time spent on specific activities, especially to increase efficiency or productivity.

Initially, time management referred to just business or work activities, but eventually the term broadened to include personal activities as well. A time management system is a designed combination of processes, tools, techniques, and methods.

The main areas of time management are goal setting, prioritization, managing interruptions, procrastination, scheduling.

To start managing time effectively, you need to set goals. When you know where you're going, you can then figure out what exactly needs to be done, in what order. Without proper goal setting, you'll fritter your time away on a confusion of conflicting priorities. There are five golden rules: 1) set goals that motivates you; 2) set SMART (specific, measurable, attainable, relevant, time bound) goals; 3) set goals in writing; 4) make an action plan; 5) stick with it.

Prioritizing what needs to be done is especially important. To work efficiently you need to work on the most important, highest value tasks.

Having a plan and knowing how to prioritize it is one thing. The next issue is knowing what to do to minimize the interruptions you face during your day. There are phone calls, information requests, questions from employees that crop up unexpectedly. Some do need to be dealt with immediately, but others need to be managed. Two excellent tools that discuss how to minimize your interrupted time are the Important Matrix and Managing Interruptions. The Important Matrix helps you look at your task list, and quickly identify the activities you should focus on. The key to controlling interruptions is to know what they are and whether they are necessary, and to plan for them in your daily schedule.

The best way to beat procrastination is to recognize that you do indeed procrastinate. Then you need to figure out why.

Once you know why you procrastinate then you can plan to get out of the habit. Reward yourself for getting jobs done, and remind yourself regularly of the horrible consequences of not doing those boring tasks.

When you know what your goals and priorities are, you then need to know how to go about creating a schedule that keeps you on track, and protects you from stress.

This means understanding the factors that affect the time you have available for work. By creating a robust schedule that reflects your priorities and well as supports your personal goals, you have a winning combination: One that will allow you to control your time and keep your life in balance.

Some tips for productivity improvement:

1) organization. The first step in any productivity improvement plan is to get organized. Think about how to arrange your physical space so that it helps, rather than hurts, your performance. Learning how to be organized is an art, and you need to work on it every day;

2) attitude. The next part of improving productivity is related to your attitude and approach to your work. Self-motivation is very important if you want to maximize your productivity. Learn what motivates you to do your best work – and then create the best environment possible so that you to do so;

3) delegation. Delegating effectively means providing sufficient support and resources so that another person can complete the job well;

4) information integration. Your productivity will also increase when you master how to identify and use information quickly. You must approach information with a critical mind. What do you need to know? What type of information will a particular document provide? Your answers to questions like these will help you determine the level of detail you need from each document. You may simply be able to ignore some items, or quickly skim topics and headings of others.

5) productive systems. Finally, to increase your productivity, improve the way that you and your team work. Improving organizational systems not only helps you accomplish more – it can also help your organization leverage its assets effectively, to achieve its objectives and be more successful.

To be more productive, get organized, have the right attitude, manage information you receive effectively, and actively seek ways to improve your working systems.

Many people spend their days in a frenzy of activity, but achieve very little because they are not concentrating on the right things. This is neatly summed up in the Pareto Principle, or the '80:20 Rule'. This argues that typically 80% of unfocussed effort generates only 20% of results. The remaining 80% of results are achieved with only 20% of the effort.

## DIFFERENT TECHNIQUES OF DIAGNOSTICS FOR ROTATING EQUIPMENT

K. Levchenko, *KM-81*

Modern technology provides a vast variety of facilities to monitor current conditions of equipment. Various methods and techniques of diagnostics are considered preferably for rotating machines in this paper.

The most rudimentary form of condition monitoring is visual inspection by experienced operators and maintainers. Failure modes such as cracking, leaking, corrosion, etc. can often be detected by visual inspection before failure is likely. This form of condition monitoring is generally the cheapest and is a vital part of workplace culture to give ownership of the equipment to the people that work with it. Consequently, other forms of condition monitoring should generally augment, rather than replace, visual inspection.

Vibration analysis is one of the most commonly used methods. Measurements can be taken on machine bearing casings with seismic or piezo-electric transducers to measure the casing vibrations.

Slight temperature variations across a surface can be discovered with visual inspection and non-destructive testing with thermography. Heat is indicative of failing components, especially degrading electrical contacts and terminations. Thermography can also be successfully applied to high-speed bearings, fluid couplings, conveyor rollers, and storage tank internal build-up.

Using a Scanning Electron Microscope of a carefully taken sample of debris suspended in lubricating oil (taken from filters or magnetic chip detectors). Instruments then reveal the elements contained their proportions, size and morphology. Using this method, the site, the mechanical failure mechanism and the time to eventual failure may be determined. This is called WDA - Wear Debris Analysis.

Spectrographic oil analysis that tests the chemical composition of the oil can be used to predict failure modes. For example, a high silicon content indicates contamination of grit and high iron levels indicate wearing components. Individually, elements give fair indications, but when used together they can very accurately determine failure modes e.g. for internal combustion engines, the presence of iron, and carbon would indicate worn piston rings.

Ultrasound can be used for high-speed and slow-speed mechanical applications and for high-pressure fluid situations. Digital ultrasonic meters

measure high frequency signals from bearings and display the result as a dBuV (decibels per microvolt) value. This value is trended over time and used to predict increases in friction, rubbing, impacting, and other bearing defects. The dBuV value is also used to predict proper intervals for re-lubrication. Ultrasound monitoring, if done properly, proves out to be a great companion technology for vibration analysis.

Headphones allow humans to listen to ultrasound as well. A high pitched 'buzzing sound' in bearings indicates flaws in the contact surfaces, and when partial blockages occur in high pressure fluids the orifice will cause a large amount of ultrasonic noise. Ultrasound is used in the Shock Pulse Method of condition monitoring.

Performance analysis, where the physical efficiency, performance, or condition is found by comparing actual parameters against an ideal model. Deterioration is typically the cause of difference in the readings. After motors, centrifugal pumps are arguably the most common machines.

Condition monitoring by a simple head-flow test near duty point using repeatable measurements has long been used but could be more widely adopted. An extension of this method can be used to calculate the best time to overhaul a pump based on balancing the cost of overhaul against the increasing energy consumption that occurs as a pump wears.

Aviation gas turbines are also commonly monitored using performance analysis techniques with the original equipment manufacturers such as Rolls-Royce plc routinely monitoring whole fleets of aircraft engines under Long Term Service Agreements (LTSAs) or Total Care packages.

Wear Debris Detection Sensors are capable of detecting ferrous and non-ferrous wear particles within the lubrication oil giving considerable information about the condition of the measured machinery. By creating and monitoring a trend of what debris is being generated it is possible to detect faults prior to catastrophic failure of rotating equipment such as gearbox's, turbines.

In conclusion, one can say that different techniques of diagnostics for rotating equipment are widely used in modern industry. Moreover there are many researches devoted to investigation of diagnostics in science. The choice of appropriate method of diagnostics depends on investigated rotating machine and its operating parameters.

Here it is significant to mention that the problem to choose the right and effective method of diagnostics is currently studied by many scientists and the importance of this field will be as long in the top as humankind will continue to use all sorts of technology.

A. Dyadechko, *ELA*

## PERSONAL IDENTIFICATION BY THE IRIS OF THE EYE

D. Tokar, V. Tarasenko, *PM-81*

Imagine being able to go to an ATM to withdraw money without the need for a card or a password. You simply look into an ATM camera, which detects the pattern of the specks on your iris and releases funds from your account. The convenience of this technology is not limited to your banking transactions. Proponents of the technology predict that iris recognition systems will soon become popular for use at work, home, and for retail and online purchases.

The core algorithms that underlie iris recognition were developed in the 1990's by Professor John Daugman, Ph.D. These were licensed to many developers of commercial iris cameras and systems including LG Electronics, Oki, Panasonic, Sagem, IrisGuard, and Sarnoff Labs. As of 2008, Daugman's algorithms are the basis of all commercially deployed iris recognition systems, although many alternative approaches have been studied and compared in the academic literature in hundreds of publications. Iris recognition remains a very active research topic in computing, engineering, statistics, and applied mathematics.

Iris recognition is an automated method of biometric identification that uses mathematical pattern-recognition techniques on video images of the irides of an individual's eyes, whose complex random patterns are unique and can be seen from some distance.

Iris recognition uses camera technology with subtle infrared illumination to acquire images of the detail-rich, intricate structures of the iris. Digital templates encoded from these patterns by mathematical and statistical algorithms allow unambiguous positive identification of an individual. Databases of enrolled templates are searched by matcher engines at speeds measured in the millions of templates per second per (single-core) CPU, and with infinitesimally small False Match rates.

This technology not only offers convenience, but also promises greater safety and security. Top airport security officials have recently recognized iris identifiers as an important tool for increasing airport security and for improving upon current immigration practices. The United States is now experimenting with technology which European banking institutions and airports have been using experimentally for over a decade with much success.

Iris recognition is becoming increasingly attractive to American consumers. Historically, the U.S. market has been reluctant to accept any form of biometric technology due to the fear of identity thefts and out of concern for other privacy matters. Recent studies have shown, however, that iris

identification systems are actually the least susceptible, of any biometric technologies, to violations of privacy and wrongful identification by authorities.

Like other biometric devices, iris recognition systems act primarily as a screening tool to allow or deny access to a particular place, rather than as a law enforcement tool to track down suspected criminals, as are DNA and fingerprints. Iris identification systems, like many other less imposing biometric devices, are used to screen individuals who are trying to gain access to more highly secure places or accounts, not to scan the general public at random.

British Airways and Virgin Atlantic Airways at Heathrow Airport in London are hoping to use the technology more for convenience and efficiency purposes – to expedite the passport control process. As a trial-run, 2,000 American and Canadian passengers, who previously had their iris' scanned at the airport, are allowed to proceed to a special line in the passport control area of the airline terminal to have their identity quickly and accurately verified by an iris reading camera. The first time the camera scanned a passenger's iris, the image was converted into a code and stored in a database. When the passenger goes through customs, he/she stands approximately 14 inches from a camera, waits a few seconds as the system attempts to match the image of the passenger's iris with those stored on the server, and is either granted or denied passage through customs based on this assessment.

Another important use of iris detection systems is in immigration security. The U.S. government and the INS are exploring various iris identification programs for use by border control facilities. Another system that will very likely become standard procedure for tracking immigrants is the use of a smart card, or ID card, like the ones used for airport security, where the immigrant's iris code, along with other biometric information, is stored on the card. This is a technology that also has incredible prospects in the terrorist-tracking industry.

Many industry observers predict widespread use of cameras, scanners, and smart-card readers, especially at airports. Too much reliance on such devices could be hazardous to national security since, like all computerized systems, any biometric system is vulnerable to skilled hackers. In fact, according to the most recent National Institute of Justice Research Report on Entry-Control Technologies, retina or iris pattern scanners are considered the most accurate of all biometric devices.

S. Zolotova, *ELA*



## PERSONAL IDENTIFICATION. FINGERPRINT RECOGNITION

A. Proschailo, S. Poltavets, *PM-81*

One of the most important problems of our time has become identification of a person on its individual parameters. To solve this problem helps biometric. Biometric is the most secure and convenient authentication tool. It can not be borrowed, stolen, or forgotten and forging one is practically impossible. Biometrics measure individual's unique physical or behavioral characteristics to recognize or authenticate their identity. Common physical biometrics include fingerprints, hand or palm geometry, retina, iris, and facial characteristics.

Let's consider the identification of the fingerprint - is the most common method of biometric identification, it is based on the uniqueness of each person drawing ridge patterns on fingers. Fingerprint image obtained by using a special scanner is converted into a digital code (convolution) and compared with the previously entered pattern (standard) or a set of templates (for identification).

One of the types of scanners is radio frequency. At the heart of their work is used the matrix elements, each of which works like a miniature antenna. Radio frequency module generates a low-intensity signal and sends it to the scanned surface of the finger. Each of the sensitive elements of the matrix receives the reflected signal from the papillary pattern. The magnitude of the induced in each miniature antenna electrical driving force depends on the presence or absence of the ridge near the papillary pattern. The resulting matrix thus voltage is converted to a digital fingerprint image.

Advantages: As analyzed by the physiological properties of the skin, the likelihood of deception of the scanner tends to zero, i.e. in case of use of the models made of silicone, rubber and other materials, the scanner will signal an attempt to deceive.

An interesting novelty is that manufacturers have started producing compact scanners - scanners that connect to a port USB. What used to be proud owners of business notebooks will soon become as commonplace as a conventional computer mouse. Scanners that allow, in conjunction with appropriate software, to facilitate the input of the password is already widely used in large corporations. And will soon be on the table and home users.

As we can see recognition of the fingerprint can help not only in apprehending the criminals and the protection of personal data, but also to reduce and simplify the work with your computer, freeing the user from entering passwords.

S.Zolotova, *ELA*

## PRESENTING FOR IDENTIFICATION

A.Sinyanska, *U-85*, A.Klushnik, *U-84*

When it is necessary to present a person for identification by a witness, victim, accused, or suspect, investigator first questions them about appearance and characteristic signs of such person and about circumstances under which the identifying person saw the person concerned, and then draws up a record of interrogation. If a witness or victim identifies the person, the former is admonished of criminal liability for knowingly misleading testimonies while the witness is also warned about criminal liability for refusal to testify. The person to be identified is presented to the identifying person together with other individual of the same sex and in number not less than three persons who don't have sharp differences in the appearance and outwear. Prior to present the person concerned for identification, such person is invited to take a place among other persons to be presented. The identifying person is asked to point at the person he/she should identify and explain by which signs he/she has identified him/her. On exceptional basis, when it is necessary to ensure protection of the identifying person, identification may be conducted out of visual observation of the person to be identified. The person who was presented for identification should be necessarily informed on the result of identification. In case of need, identification may be conducted by photos. A person is presented for identification in the presence of two attesting witnesses at least. When identification is conducted out of visual observation of the person to be identified, attesting witnesses should make sure that identification out of visual observation of the person to be identified is really possible and they should attest such identification.

If it is necessary to present an object for identification, investigator asks the identifying person about characteristic signs of this object, as well as about circumstances under which the identifying individual saw this object and draws up a record of interrogation. Whenever the identifying individual is a victim, the latter is warned about criminal liability for knowingly misleading testimonies while the witness is admonished of criminal liability for refusal to testify. The object to be identified is shown to the identifying person among other similar objects. The identifying individual is invited to point at the object which he/she is supposed to identify, and to explain by which signs he/she has identified the object concerned. Objects are produced for identification in the presence of two attesting witnesses at least. Objects presented for identification should be photographed.

S. Zolotova, *ELA*

## STRESS MANAGEMENT

I. M. Protsenko – *Sumy State University, group M – 81*

V. E. Pronyaeva – *EL Adviser*

Stress management refers to a wide spectrum of techniques and psychotherapies aimed at controlling a person's levels of stress, especially chronic stress, usually for the purpose of improving everyday functioning.

Stress Management is needed by the majority of us today. Students are under great pressure, job seekers are competing, parents usually are busy providing and some people are only attempting to pay our bills. No matter what, learning healthier stress relief techniques can make your wellbeing much better.

Everything in life can cause stress. You can be stressed by relationship problems, family problems, emotional problems (such as anxiety and depression), social situations, your job and where you live.

It's undeniable — life is full of stress. Understanding the types and sources of stress — big and small, short-term and long-term, internal and external — is an important part of stress management.

The symptoms of stress are a faster heartbeat, stiff neck, headaches, sleeping problems, stomach problems, back pain, sweaty palms and reduced immune system efficiency which can lead to disease and illness.

In order to develop an effective stress management programme it is first necessary to identify the factors that are central to a person controlling his/her stress, and to identify the intervention methods which effectively target these factors. Lazarus and Folkman's interpretation of stress focuses on the transaction between people and their external environment (known as the Transactional Model). The model contends that stress may not be a stressor if the person does not perceive the stressor as a threat but rather as positive or even challenging. Also, if the person possesses or can use adequate coping skills, then stress may not actually be a result or develop because of the stressor. The model proposes that people can be taught to manage their stress and cope with their stressors. They may learn to change their perspective of the stressor and provide them with the ability and confidence to improve their lives and handle all of types of stressors.

Stress can affect your relationships and work so you should have an idea of the major stressors and stress management techniques.

The following stress management techniques will help you get relief from stress quickly and supply you with the tools you need for long-term stress management.

1. Exercise – Regular exercise is one of the best methods for long-term stress management, weight loss, and just feeling better about yourself.

2. Deep breathing – When you get stressed your breathing naturally becomes shallow. If you practice some deep breathing you will immediately feel better.

3. Practice progressive relaxation –If you relax your body then you will automatically relive stress.

4. Use guided imagery –If you think angry thoughts you will feel angry and if your think happy thoughts you will feel happy.

5. Practice Meditation – Meditation is a well known stress reducer

6. Self-Hypnosis – Self-hypnosis is easy to do and is very effective at changing thinking patterns that cause stress.

7. Start a stress journal –To gain more control over stressful events keep a record of every situation that caused you to get stressed, how you reacted to the stress (did you get angry, snap at someone or feel hopeless), and what you can do in the future to deal with this stress.

8. Just write – Writing out your thoughts and feelings is a great way to release pent up emotions.

9. Manage your time better – A lot of stress we face is because we lack the time to do everything we want.

10. Set goals – Studies have shown that people who have a purpose in life are more motivated and more resilient to stress.

11. Sleep well – Sleep is our body's natural way to releasing stress.

Many practical stress management techniques are available, some for use by health practitioners and others for self-help, which may help an individual to reduce stress, provide positive feelings of being in control of one's life and promote general well-being.

Stress management is the alteration of stress and especially chronic stress often for the purpose of improving everyday functioning.

Stress management has physiological and immune benefits.

So Stress Management is a set of strategies, methods and techniques that allow a person to prevent a negative impact stressors or reduce this impact to a minimum.

Stress can cause severe health problems and, in extreme cases, can cause death. While these stress management techniques have been shown to have a positive effect on reducing stress, they are for guidance only, and all people should take the advice of suitably qualified health professionals if they have any concerns over stress-related illnesses or if stress is causing significant or persistent unhappiness. Health professionals should also be consulted before any major change in diet or levels of exercise.

## RETINAL SCAN

D. Shapko, *EP-81*

When we want to do anything online, we identify ourselves through user IDs and passwords. These identifying tools are not only difficult to manage, their security is also a cause of concern. IDs and passwords can be forgotten or stolen; devices can be hacked or tampered with. Many of us find ourselves juggling around with up to 100 passwords, far too many for the human mind to remember. Some take the path of least resistance and write their passwords on pieces of paper, which they store in their desks or even stick to their computer screens. We have reached a stage where we need alternatives to passwords.

Used almost exclusively in high-end security applications, the retinal scan uses a low-intensity light source and a delicate sensor to scan the pattern of blood vessels at the back of the retina, a pattern unique to each individual. It is not to be confused with another ocular-based technology, iris recognition. Though it was known as early as the 1930s that each human eyeball had unique characteristics, it was not until 1984 that the first retinal scanner was made available for commercial use. It was produced by EyeDentify, a company formed in 1976, still the primary manufacturer of these devices.

During a retinal scan, the user must remove glasses, stare at a specific point, and hold their head still for the 5-0.5 seconds it takes to complete the scan. A retinal scan is very difficult to fake because no technology exists that allows the forgery of a human retina, and the retina of a deceased person decays too fast to be used to fraudulently bypass a retinal scan.

Retinal scanning is part of biometrics, the field of science and engineering which develops ways to uniquely identify individual persons. The most popular form of biometrics employed today is of course the fingerprint, though the error rate for fingerprint identification is sometimes as high as 1 in 500. A retinal scan, on the other hand, boasts an error rate of 1 in 10,000,000. Its close cousin, the iris scan, is slightly less precise, maintaining an error rate of approximately 1 in 131,000.

Traditionally used to block physical gateways, such as those guarding the cores of power plants or military installations, the retinal scan has been employed in recent times to safeguard critical computers and their data. The retinal scan retails for as low as \$220, making it affordable to anyone wanting to maintain high levels of security. Furthermore, it is probably the most accurate biometric available, far surpassing the fingerprint in both reliability and accuracy.

S. Zolotova, *ELA*

## TIDAL ENERGY SYSTEMS

I. Hrushetska, *EM-81*

Efficient energy use is the goal of efforts to reduce the amount of energy required to provide products and services. There are various different motivations to improve energy efficiency. Reducing energy use reduces energy costs and may result in a financial cost saving to consumers if the energy savings offset any additional costs of implementing an energy efficient technology. Reducing energy use is also seen as a key solution to the problem of reducing emissions. We can say that efficient energy use can help to control global emissions of greenhouse gases. Humanity has to figure out all importance of this colossal problem.

Why Tidal Energy? This kind of power is always offered as an alternative energy source, but is largely ignored in favour of wind and solar power. As a replacement to traditional fossil fuels, tidal power can make a significant contribution on a local and regional scale to the power grid of several countries.

The constant interaction between earth and its moon make for one of the most complex yet overlooked scientific phenomena: the tidal system. Harnessing energy from such an extremely predictable source seems rather practical and ingenious. However, significant tidal range, the one crucial component of the system, can only be found in isolated areas of the world.

How does tidal power work to generate electricity? Conversion of tidal energy into electrical energy is possible through the construction of tidal power stations.

There are many different designs of tidal power stations but overall they share the same goal. A tidal barrage is created at the mouth of a river or other choke point that connects to the ocean. You can think of this as basically a dam. In flood tidal power generation below the water level there are opening in this barrage that have turbines in them. These turbines are powered when the tide goes in or the water level rises. After ebb the water level decreases and water goes out what makes turbines work again.

Costs of tidal power stations compared to traditional power sources are much higher during development but much lower during operation. Unfortunately this means that governments are usually unwilling to help finance tide power stations because of this long investment to return lag. Lately though governments have been realizing the importance of such renewable and alternative energy sources and have begun to pick up funding projects such as tide power generation. Tidal power history is a short one but hopefully the first chapter of many to come.

A. Dyadechko, *ELA*

## HOW TRICKLE-DOWN ECONOMICS WORKS

Alina Lavrynenko

Tax policy has always remained a dubious question for the government of any country. History showed loads of approaches to taxation, but those introduced by trickle-down theory still remain highly controversial. Although economists agree that changing how a government taxes its citizens can have some dramatic effects on an economy, they disagree on which policy is best. Trickle-down theory represents one such idea that can supposedly spur economic growth.

"Trickle-down economics" and "the trickle-down theory" are terms used in United States politics to refer to the idea that tax breaks or other economic benefits provided by government to businesses and the wealthy will benefit poorer members of society by improving the economy as a whole. It is based on the premise that within an economy, giving tax breaks to the top earners makes them more likely to earn more. Proponents of these policies claim that if the top income earners are taxed less that they will invest more into the business infrastructure and equity markets, it will in turn lead to more goods at lower prices, and create more jobs for middle and lower class individuals. Proponents also argue that economic growth flows down from the top to the bottom, indirectly benefiting those who do not directly benefit from the policy changes. According to the theory, this boost in growth will ultimately help those in lower income brackets as well. Although trickle-down economics is often associated with the policies of Ronald Reagan in the 1980s, the theory dates back to the 1920s. The name also has roots in the '20s, when humorist Will Rogers coined the term, saying, "The money was all appropriated for the top in the hopes it would trickle down to the needy".

David Stockman, U.S. politician and businessman, placed supply-side economics in a long tradition in economics and claimed that laissez-faire, or trickle-down economics, will benefit not just "those well placed in the market" – the wealthiest people, but also "those poorly placed in the market" – the poorest people. A more general version argues that increases in real gross domestic product are beneficial for poor people – indirectly, marginally and eventually beneficial, of course – as a consequence, or side effect, of their being directly, significantly and immediately beneficial for the rich people.

Some argue that giving tax breaks to the wealthy can actually increase tax revenue for a government. This might seem difficult to believe, but Arthur Laffer, American economist, argued otherwise. He concluded that government tax rates and revenues don't have a directly positive correlation. In what became known as the Laffer curve, Laffer showed that the relationship between taxes and revenues looks like a curve rather than a straight line. In other words, tax revenues don't rise consistently like tax rates do. Laffer's curve shows that when tax rates are at zero, revenues are zero as well – the government makes no money when it taxes nothing. But it's the same result if the tax rate were 100 percent. The Laffer curve postulates that once the rates get too high, the steep taxes discourage work to an extent that the revenues themselves suffer. The range in which taxes are too high for maximum revenues is called the prohibitive range. When taxes are in the prohibitive range, a tax cut would produce an increase in tax revenues, according to Laffer. But the ideal tax isn't necessarily 50 percent; rather, it depends on the taxpayers. Through Laffer's Curve it is possible to visualize how tax rates could discourage people from producing, which results in fewer jobs and a hurting economy. If Laffer's Curve is correct, then cutting taxes for the wealthy can encourage investment and production to promote general economic health. Redubbed supply-side economics, trickle-down economics found new life in the United States in the 1980s.

Trickle-down economics received lots of critics. Economist Thomas Sowell has written that the actual path of money in a private enterprise economy is quite the opposite of that claimed by people who refer to the trickle-down theory. He noted that money invested in new business ventures is first paid out to employees, suppliers, and contractors. Only some time later, if the business is profitable, does money return to the business owners – but in the absence of a profit motive, which is reduced in the aggregate by a raise in marginal tax rates in the upper tiers, this activity does not occur. Sowell further has made the case that no economist has ever advocated a "trickle-down" theory of economics, which is rather a misnomer attributed to certain economic ideas by political critics. The economist John Kenneth Galbraith noted that "trickle-down economics" had been tried before in the United States in the 1890s under the name "horse and sparrow theory." He wrote, "Mr. David Stockman has said that supply-side economics was merely a cover for the trickle-down approach to economic policy – what an older and less elegant generation called the horse-and-sparrow theory: If you feed the horse enough oats, some will pass through to the road for the sparrows.

Pronyeva V.E.-*EL adviser*



## TYPES OF AUCTIONS, THEIR PREVALENCE AND SIGNIFICANCE

Tetiana Rudenko, *E-81*

An auction is a process of buying and selling goods or services by offering them up for bid, taking bids, and then selling the item to the highest bidder. The word "auction" is derived from the Latin *augeō* which means "I increase" or "I augment". For most of history, auctions have been a relatively uncommon way to negotiate the exchange of goods and commodities. In practice, both haggling and sale by set-price have been significantly more common. Indeed, prior to the seventeenth century the few auctions that were held were sporadic and infrequent.

The oldest auction house in the world is Stockholm Auction House. It was established in Sweden in 1674. Sotheby's, now the world's second-largest auction house, held its first auction in 1744. Christie's, now the world's largest auction house, was established around 1766. Other early auction houses that are still in operation include Dorotheum (1707), Bonhams (1793), Phillips de Pury & Company (1796), Freeman's (1805) and Lyon & Turnbull (1826). The development of the Internet, however, has led to a significant rise in the use of auctions as auctioneers can solicit bids via the Internet from a wide range of buyers in a much wider range of commodities than was previously practical.

**English auction**, also known as **an open ascending price auction**. This type of auction is the most common form of auction in use today. Participants bid openly against one another, with each subsequent bid higher than the previous bid. An auctioneer may announce prices, bidders may call out their bids themselves (or have a proxy call out a bid on their behalf), or bids may be submitted electronically with the highest current bid publicly displayed. In some cases a maximum bid might be left with the auctioneer, who may bid on behalf of the bidder according to the bidder's instructions. The auction ends when no participant is willing to bid further, at which point the highest bidder pays their bid. Alternatively, if the seller has set a minimum sale price in advance (the 'reserve' price) and the final bid does not reach that price the item remains unsold. Sometimes the auctioneer sets a minimum amount by which the next bid must exceed the current highest bid. The most significant distinguishing factor of this auction type is that the current highest bid is always available to potential bidders. The English auction is commonly used for selling goods, most

prominently antiques and artwork, but also secondhand goods and real estate. At least two bidders are required.

**Dutch auction** also known as **an open descending price auction**. In the traditional Dutch auction the auctioneer begins with a high asking price which is lowered until some participant is willing to accept the auctioneer's price. The winning participant pays the last announced price. The Dutch auction is named for its best known example, the Dutch tulip auctions. In addition to cut flower sales in the Netherlands, Dutch auctions have also been used for perishable commodities such as fish and tobacco. In practice, however, the Dutch auction is not widely used.

**Sealed first-price auction**, also known as **a first-price sealed-bid auction (FPSB)**. In this type of auction all bidders simultaneously submit sealed bids so that no bidder knows the bid of any other participant. The highest bidder pays the price they submitted. This type of auction is distinct from the English auction, in that bidders can only submit one bid each. Furthermore, as bidders cannot see the bids of other participants they cannot adjust their own bids accordingly. This kind of bid produces the same outcome as Dutch auction. Sealed first-price auctions are commonly used in tendering, particularly for government contracts and auctions for mining leases.

**Vickrey auction**, also known as **a sealed-bid second-price auction**. This is identical to the sealed first-price auction except that the winning bidder pays the second highest bid rather than his or her own. Although extremely important in auction theory, in practice Vickrey auctions are rarely used.

Multi-unit auctions sell more than one identical item at the same time, rather than having separate auctions for each. This type can be further classified as a uniform price auction or a discriminatory price auction.

Most auction theory revolves around these four "standard" auction types.

Pronyeva V.E. - *EL adviser*

## IDENTIFICATION OF MOTION

V.O.Hlushchenko, I.I.Kolodochka, A.O. Miroshnychenko, *K-81*

Nowadays, science is developing very rapidly, and people need to test the new inventions in practice. But some of these tests are very expensive, some dangerous, or we can't hold them in the Earth conditions, such as the explosion of atomic bomb or rocket launch into space. In the recent past, people spent months or even years, with millions of dollars to prepare such experiments and if something goes wrong then started again incurring huge financial losses. But now we can avoid this by changing a few keystrokes, using FlowVision.

Program complex FlowVision – leader of the numerical simulation of steady and unsteady motion of liquid and gas. FlowVision solves the problems of internal and external aero-hydrodynamics. Numerical integration of equations of fluid motion is based on the finite volume method.

FlowVision has unique features: dual solves the problem of interaction flow with the body, expects the joint motion of the free surface and floating bodies, automatically builds a grid for the calculated areas of any difficulty.

In turbo mechanical engineering FlowVision effectively counts for a aggregate with rotating parts. If the rotating parts can be surrounded by cylindrical surfaces we use the technology of “sliding grids”. If the rotors can not be surrounded by a cylindrical surfaces - the technology of "movable bodies".

FlowVision is used to simulate the mixing of liquids in a variety of chemical reactors. During the simulation process is controlled by the quality of mixing. In such way increase the productivity of the unit.

Summing up should be added that the ability to solve difficult problems in power engineering and thermal physics makes FlowVision invaluable for all engineers. Set of models of physical processes helps to calculate the motion of gases and liquids inside burners, engines, boilers, pumps, turbines, compressors, etc.

Every engineer in the world in the beginning of any calculation of liquid or gas motion faces with a problem of identification of motion.

In the recent past to solve this problem engineer have to build very difficult systems of equipments and in the end of calculation they takes not at accurate results with errors. But now we can solve it in five minutes with the help of FlowVision Complex.

There are two main types of motion: laminar flow, turbulent flow.

A.M.Dyadechko, *ELA*

## PROTECTION OF BIOLOGICAL DIVERSITY

Y.V. Miroshnichenko, *group EK – 81*

Life comes in an almost unending variety of shapes and sizes, and we all depend on this biodiversity for our food, health and security. This incredible natural wealth is a priceless resource. Loss of just one species could have untold effects on the world as we know it. So, the importance of safeguarding biodiversity is paramount.

The decade 2010 to 2020 has been designated the United Nations International Decade of Biodiversity. It's an opportunity for organizations across the world to come together and promote the importance of conserving the biodiversity on our planet.

There is a wide range of conservation organizations working to protect biodiversity. Different organizations have different objectives.

WWF, World Wildlife Fund, is the leading organization in wildlife conservation and endangered species. WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature. Therefore, main activities of the organization consist of conserving the world's biological diversity and promoting the reduction of pollution. Now WWF is the largest conservation organization in the world with 5 million supporters, which working in more 100 countries and supporting over 1,300 environmental projects.

IUCN, The International Union for Conservation of Nature, is the oldest global environmental organization. Its mission is to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable. IUCN influences on international environmental conventions, policies and laws in more than 1,200 government and non-governmental Member organizations. 11,000 experts of IUCN set global standards in their fields, for example, the definitive international standard for species extinction risk – the IUCN Red List of Threatened Species.

GEF, The Global Environment Facility, is the largest funder of projects to improve the global environment. An independent financial organization, the GEF provides grants to developing countries for projects related to biodiversity, climate change, international waters, land degradation and persistent organic pollutants and others.

S.V. Mikhno, *ELA*

## GLOBAL FINANCIAL CRISIS TODAY

Kovalenko E., *E-72*

It was three years ago when the global financial system suffered a nearly fatal heart attack. Around the world stock markets have fallen, large financial institutions have collapsed or been bought out, and governments in even the wealthiest nations have had to come up with rescue packages to bail out their financial systems. At the same time, the flooding of global financial markets with cheap dollars has fatally undermined the international monetary system and destroyed the credibility of the US dollar as the world reserve and trading currency.

Since the onset of the financial crisis in 2008, the World Bank Group has committed \$196.3 billion to developing countries, including record commitments in education, health, nutrition, population, and infrastructure, providing much-needed investments in crisis-hit economies. But recovery from the global financial crisis remains fragile.

There are abundant signs that the symptoms of 2008 are returning with a vengeance. Unemployment rates in all the major advanced economies are far higher. In addition, the level of public debt has been expanded by leaps and bounds. Taken together, this means that the global economy has much less latitude available for absorbing future economic and global shocks such as a major spike in oil prices, systemic bank collapse or, as is increasingly likely, sovereign debt default. Central banks have less possibility to ease monetary policy than they did three years ago; cash-strapped governments cannot afford to boost spending as much and political disarray in some countries may make concerted global policymaking harder.

For most of the countries, the European Union is one of the most, if not the most, important business partners for trade, for investment, for imports and exports. But as Europe's financial crisis forces governments to cut their budgets, and slows economic activity, many consumers have less to spend. And that is having a ripple effect around the world.

The global financial crisis has spawned a global protest movement campaigning against things like inequality, corporate greed, lack of jobs, etc. All over the world people protesting against the powers that be: in Egypt, Greece, Spain. This time, the global financial crisis has hit the ordinary citizens of Western nations quite hard, and inspired by the Arab Spring and protests in Spain, a global movement seems to have sprung up.

Gladchenko O.R., *EL adviser*

## **A SEARCH OF METHODS OF TIMELY WARNING OF THE PHENOMENON OF SURGE IN CENTRIFUGAL PRESSURIZER OF GASCOMPRESSOR UNIT**

S.V. Sergijenko, *student group KM-71*

Surge is a burble of gas in a compressor with the loss of dynamic stability. The vibrations of expense and pressure of gas arising up here can result in destruction of equipment. The phenomenon of surge arises up, when pressure on the exit of supercharger is high, and gas expense through it is subzero. For protecting of centrifugal supercharger from the surge, gas flowing is used from the exit of a compressor to its entrance in an amount necessary for avoidance of surge.

The phenomenon of surge is studied very little and the calculation of border of surge area is impossible. It can be only approximately certain only by means of the already known descriptions, executed by analogical machines. Derangement can be examined as a poly stationary and surge as a batch process.

Surge as a global (complete) loss of stability is the impermissible phenomenon for a centrifugal compressor.

Centrifugal compressors are mainly equipped by the self-reactance systems of blow-off defence. The presence of an own patent on such a system is considered prestige, therefore practically every producer offers the own system. Work of all such systems is based on that gas-dynamic description of a compressor at permanent speed of rotation, and permanent weight of gas has an only point on the border of surge.

In most practical cases the decision of problem of anti-surge defence is taken to non-admission of approaching of the mode of operations of a compressor to the border of surge due to adjusting of parameters of a compressor (pressure, gas expense...) by means of flowing of gas from the supercharger of a compressor to suction by means of opening of bypass faucet.

A process of integration of practically any functional units, executed by one developer in the systems managements, that is executed by other developers, is in itself by a conflict. Therefore the process of such integration is understood as a process of power introduction. Such introduction is always fight against obstacles. A reason of these conflicts is not always clear .

D.O. Marchenko – *EL Advisor*

## MATHEMATICAL MODEL OF TRIBOLOGICAL SYSTEM AT THE BOUNDARY LUBRICATION MODE

A.M. Zaskoka, *student*

In work one of possible approaches to the description of a stick-slip friction mode in a nanotribological system which is observed experimentally is developed. The melting of an ultrathin lubricant film clamped between two atomically smooth surfaces is investigated. The mode of the boundary friction sets in given system, is observed, when the lubricant thickness does not exceed 10 atomic diameters. In that case it is impossible to discuss about a liquid or solid state of lubricant as symmetry of a condition is influenced essentially by interaction from rubbing surfaces, therefore discuss about liquid-like and solid-like state, which are interpreted as kinetic modes between which there can be first order phase transitions. For the description of phase transitions it is entered kinetic equation in the form of Landau-Khalatnikov with item for the account of additive noises of the basic quantities.

It is considered coordinate and shear velocity of the block fixed between two springs when another block, under that, is under periodical influence in presence of forces of interaction between friction surfaces. It is studied the kinetic equation with which help values of elastic strain and friction force are calculated. Thus stick-slip motion is described. It is shown, that in a wide range of parameters of systems the stick-slip mode of movement is realized. Also are found modes in which motion of the top block not equally influences on the moving of bottom block, such case corresponds to realization in system of memory effects (the result proves to be true experiments). Predicting results of behavior of whole system with increase in temperature, dependences of the maximum values of friction force and elastic stress from temperature, rigidity of a spring and proportionality factor between viscosity of lubricant and a gradient of velocity for different types of lubricants (pseudoplastic, Newtonian and dilatant fluids) are received. Thus the model considers both thermodynamic melting, and melting at increase of shear velocity, and can be generalized for the description of real experiments. Researches allow to explain the effects arising in experiments, and to predict behavior of system at change of external and internal parameters

ELA – T.A. Aleksakhina

## WHAT YOU'RE SAYING WITHOUT SAYING A WORD

Ann Podoprigora, *J – 71*

Research shows that clues in the nonverbal "channels" of communication (how something is said) are often more important than words alone (what is said). Nonverbal communication is usually understood as the process of communication through sending and receiving wordless (mostly visual) messages between people. There are many different "channels" of nonverbal communication: facial expressions (smiling is an expression of happiness in most cultures, it can also signify other emotions. Some Chinese, for example may smile when they are discussing something sad or uncomfortable), the clues in our voices ("vocal paralanguage"), hand gestures, body movements ("kinesics") (In Argentina and Spain to hold up crossed fingers is made to ward away bad luck. In China, it signifies the number ten), touch ("haptics") (In some cultures, light touching of the arm or a light kiss to the cheek is very common, even among people who have just met. People from Latin America and Eastern Europe may be very comfortable with this kind of touching, whereas people from many Asian cultures may prefer less physical contact with acquaintances), and personal space (To many Indians, it is considered rather offensive to (even accidentally) step on someone's foot. Apologies should be made immediately).

Why is non-verbal communication important? Basically, it is one of the key aspects of communication. It has multiple functions: 1)Used to repeat the verbal message (e.g. point in a direction while stating directions) 2)Often used to accent a verbal message (e.g. verbal tone indicates the actual meaning of the specific words) 3)Often complement the verbal message but also may contradict (e.g. a "wink" may contradict a stated positive message) 4) Regulate interactions (non-verbal cues convey when the other person should speak or not speak) 5)May substitute for the verbal message: gestures (finger to lips to indicate need for quiet), facial expressions (nod instead of a yes).

Note the implications of the proverb: "Actions speak louder than words." In essence, this underscores the importance of non-verbal communication. Non-verbal communication is especially significant in intercultural situations. Probably non-verbal differences account for typical difficulties in communicating.



Linked by common origins and similar paths of development, visual and verbal communication are both defined by the culture from which they were created. When one first learns to speak a second language, they may be deterred from fluency by their nonverbal signs. Changing with each culture is the translated definition of body language. When at first exposed to a new environment where attitudes, language and behavior are all unfamiliar, people may often suffer from culture shock. With these varying meanings from country to country it is easy to see how misunderstanding may occur.

Culture gives meaning to manners, different hand gestures, how close we may stand when conversing, our patience, and even handshakes and greetings; and thus, culture influences every aspect of nonverbal communication. Equally as vital to convey a message or an image, it is important to understand how performing smooth interactions requires eloquence with not only spoken language but visual as well. Just as Socrates described in PHAEDO, there are two worlds: the first is a world of imperfection impeded by its inept medium of speech, and the better second world of perfection where all things are communicated visually, without the need for words.

Tips for providers: Follow the person's lead. If the person moves closer or touches you in a casual manner, you may do the same. Use hand and arm gestures with great caution. Gestures can mean very different things in different cultures. Be careful in interpreting facial expressions. They may lead you to misinterpret the person's feelings. This is also true of the presence or absence crying and other expressions of pain, which are closely tied to a person's culture. Don't force a person to make eye contact with you. He/she may be treating you with greater respect by not making eye contact.

*English Advisor Bashlak I.A.*

## TORSIONAL VIBRATION

A.S. Bury – *group KM-71*

Torsional vibration can be broadly described as the angular vibration of any object as a result of applied torque. It can be defined specifically as the periodic motion corresponding to a shaft, where the shaft is twisted about its axis, alternating from one direction to the other.

Torsional vibration is commonly a concern in large power transmission systems that incorporate shafts or couplings. In such environments, uncontrolled torsional vibration can cause transmission failure. An ideal power transmission system is one in which the applied and reacted is smooth, thereby resulting in motion that is predictable and has a constant speed. Unfortunately, this is not how power transmission systems function in reality. In most cases, the torques created are not smooth. It is practically impossible to ensure that all components of a power transmission system function perfectly all the time. Therefore, alternating torques occur all the time, resulting in vibration about the axis of rotation.

The sequence of forces that the crankshaft is subjected to is commonly organized into variable tangential torque curves that in turn can be resolved into either a constant mean torque curve or an infinite number of sine wave torque curves. These curves, known as harmonics, follow orders that depend on the number of complete vibrations per revolution. Accordingly, the tangential crankshaft torque is comprised of many harmonics of varying amplitudes and frequencies. Unchecked torsional vibration can cause cracking, crankshaft failure, or failure of the parts that the crankshaft drives. It can also cause excessive wear and tear of bearings and gear parts. It can lead to broken accessory drives and the throwing/slapping of engine belts. Torsional vibration can be controlled by placing a torsional damper at the front nose of the crankshaft. This damper is usually included as a part of the front pulley in automobiles. Torsional dampers are of two types: viscous dampers and harmonic dampers.

The most common way to calculate torsional vibration is by using equidistant pulses over a single shaft revolution. Shaft encoders dedicated for this task generate these pulses. The resultant pulse train is converted into either a digital rpm reading or a voltage proportional to the rpm.

D.O. Marchenko – *EL Advisor*

## IMPROVEMENT OF LOCAL BUDGET FILLING

V.V. Chervyak – *group F-73*

I.A. Morozova – *EL Adviser*

Local self-government is really a democratic and very effective form of territorial development.

The capital base of local budgets is characterized by low part of own profits, as a result, by the annual increase of interbudgetary transfers which are given from the state budgets; insignificant revenues from the local taxes and fees, weak own revenue base; inconsistency of financial relations between state administrations, local self-government bodies in the process of public goods resource providing.

Starting from 2011, according to the Tax Code of Ukraine passed in 2010 the amount of local taxes and charges was reduced from 15 to 5. There are 3 obligatory local taxes and charges such as a tax on real estate (other than land property), single tax and a license charges for special entrepreneurial activities. The two optional charges are a charge on parking of transport and a tourist charge. Property tax will be due from 1 January 2012.

The greatest part of tax receipts among the federal states is in Germany (60%) and Canada (59%), and among the unitary states - in Sweden (74%), Denmark (53%). In Ukraine part of tax receipts in the erected budget folds 75%.

To reduce dependence on financial aid, to improve the quality of investments and economic growth it is necessary to:

1. expand the revenue base of local budgets by assigning to them income tax for individuals;
2. search for alternative sources of own revenue: the introduction of wealth tax;
3. finally introduce a tax on real property. Introduction of real estate tax will bring a lot of real benefits for city community, among these most important are: increase of financing of social and economic programs in spheres of housing and municipal utilities, health care, education and culture and so on; restriction of speculations on real estate market and constraint of dwelling prices; establishment of modern infrastructure in city, which will lead to growth of investment attraction and creation of new job places; effect of “wealth tax”, when tax load will be distributed by the principle of social justice;
4. stimulate investment activity in the region by taking into account natural resources, industrial and human potential.

## LIVING WAGE

A.I. Chihar – *group F-73*

I.A. Morozova – *EL Adviser*

Families who work for low wages face impossible choices — buy food or heat the house, feed the children or pay the rent. The result can be spiraling debt, constant anxiety and long-term health problems. In many cases it means that the adults in the family are working long hours, often at two or three jobs, just to pay for basic necessities. They have little time to spend with their family, much less to help their children with school work or participate in community activities.

The story of child poverty is very much a story of low wages. More than half poor children live in families where at least one person has a full-time job. The living wage is a call to private and public sector employers to pay wages to both direct and contract employees sufficient to provide the basics to families with children.

The living wage is one of the most powerful tools available to address this troubling state of poverty amid plenty allows us to get serious about reducing child poverty, and ensures that families who are working hard get what they deserve — a fair shake, and a life that's about more than a constant struggle to get by.

A living wage is not the same as the minimum wage. The living wage differs from the minimum wage in that the latter is set by law and can fail to meet the requirements of a living wage - or is so low that borrowing or application for top-up benefits is necessary. It differs somewhat from basic needs in that the basic needs model usually measures a minimum level of consumption.

The minimum monthly wage for 2011 was set at UAH 941 from January 1, 2011, UAH 960 from April 1, UAH 985 from October 1, and UAH 1,004 from December 1, while the minimum hourly wage was set at UAH 5.66 from January 1, 2011, UAH 5.77 from April 1, UAH 5.92 from October 1, and UAH 6.04 from December 1 (UAH 7.95 / USD 1).

The living wage and the minimum wage for able-bodied citizens in Ukraine in 2012 will grow by 12.9%, from UAH 1,004 to UAH 1,134.

In an era of globalization we need new institutions to rebuild the social contract and to reassert democratic goals of equity and inclusion. For both economic and political reasons, the future of workers and communities is tied to labor markets and industry clusters that are regional in scope.

## **EXPANSION OF THE USE OF NEURAL NETWORKS IN ENGINEERING**

V.G. Kontsevich, Ph.d.; V. Degtyar

Neural network is one of the directions of research in the field of artificial intelligence based on trying to reproduce the human nervous system.

Artificial neural networks are widely used in solving various tasks and actively applied where common algorithmic solutions are ineffective or impossible. Among the challenges that rely on artificial neural networks, are the following: recognition of texts, contextual advertising on the Internet, spam filtering, inspection of suspicious transactions by credit card, security systems and video surveillance systems — and this is not all.

Principle of artificial neural network based on our understanding of the brain. In nature, these are neurons cells that serve as basic units of processing in the brain. They are closely interrelated and interact through the grid navigation, which is called "synopsis". One neuron receives signals (entrance) of many other neurons, and subsequently he decides to generate or not electric pulse (exit) on the basis of received signals.

In computing terms, we can simulate this kind of process using linear algebra. Information comes into the system as a vector (a column of numbers), where each element of this vector is "neuron". Connections between neurons (synopses) are represented by the matrix. It is called the transformation matrix, which modifies the elements of the original vector. When the neural network processes data, it just grabs the biggest matrix and multiplies its input vector. Key to the whole problem is figuring out what elements of the matrix must be converted.

Much of the researches in the field of neural network technology belong to engineering problems. In this area there is a tendency to replace production modules with high levels of automation, and it requires increasingly more intelligent and self-regulative machines that would be able to handle a large range of parts, to collect and configure various devices, to assess the quality of the product while minimizing human-control and intervention of the operator.

S.V.Podolkova – *EL Adviser*

## PHOTOGRAPHY IS A PURE MIRACLE

D.A. Drozdenko, *student PhE-71*

No wonder technical devices take the first place in the list of modern miracles and the photography should be mention at the top of the list. Photography is the process, activity and art of creating still or moving pictures by recording on a film or electronic sensor. The word "photograph" means "drawing with light".

Photography is the purely technical miracle. It is the result of combining several technical discoveries. Invented in the first decades of the 19th century, photography seemed to be able to capture more details and information than any traditional media, such as painting and sculpting. Joseph Niépce made the first permanent photo from nature with a camera obscura in 1826. The modern cameras have evolved from that.

All photos were originally monochrome, or black-and-white. The first permanent colour photo was taken in 1861 by physicist James Clerk Maxwell. However, black-and-white photos continued to dominate for decades. They are "classic" professional look.

New technological trends in digital photography opened a new direction in full spectrum photography in 1960, where careful filtering choices across the ultraviolet, visible and infrared rays led to new artistic visions. Full spectrum photography proves to benefit greatly in fine art photography, geology, forensics and law enforcement. And even some people claim it is used in ghost hunting.

Photo can be used in some ways. First, commercial photos are probably best defined as any photography for which the photographer is paid for images rather than works of art. Second, photography is considered to be a modern art as well as music, painting, etc. In science, photo can be used in recording events and data in science and engineering. An amateur photographer is the one who practices photography as a hobby but not for profit.

Photo is not only a technical wonder, it is a pure miracle, because it allows you to keep the memory of remarkable moments, such as a child's happiness, the end of the war, a moment of your victory, your parties. But some people do not like to be photographed because they argue it takes away some part of your soul.

Besides, photo is a miracle because it is a way to realize yourself as an artist. A photo can also help you share feelings of love, home, happiness, loneliness and even your style.

Mulina N.I., *Ph.D., EL adviser*

## **FACEBOOK IS THE ONE OF THE LARGEST SOCIAL NETWORK IN THE WORLD**

Tseghnikova D.M., *student E-72*

Facebook is now considered a very large social network in the world, the number of users as of November 2010 degree reached almost 600 million.

In addition, Facebook today is the best example of successful company of the XXI century.

History of Facebook started from the fact that Harvard university student Mark Zuckerberg broke university database and created a site Facemash, where pairs derived photo students, and proposed to evaluate which of them looks more attractive. After a while Mark launched the social network Facebook.

Thanks to the Facebook people can keep in touch with their friends. Previously, the society had no such opportunity, but now to the general joy, things are different. Communication between people is not limited to simple correspondence. With Facebook you can see how a person live, looking at his photos, notes, videos and other.

But not just ordinary people use the brainchild of Mark Zuckerberg. Many companies are looking for new recruits on Facebook, as well as communicate with clients.

The authority of Facebook among students seriously raised the fact that the site was created by the same students: Mark Zuckerberg, Dustin Moskowitz and Chris Hughes. Mark Zuckerberg launched Facebook in the beginning of 2004 year.

Facebook started their development in the investors' money, and the first investor was Peter Thiel , the famous founder of the electronic payment system PayPal.

Today in Facebook works about 230 sponsor groups, which bring the project \$ 23 million per month. Among the companies that have organized their sponsoring groups can be identified such as Apple, Nike, Victoria's Secret.

Facebook continues to grow and expand; the number of users exceeded 20 million per month. This makes Facebook one of the largest social network in the world. Many countries have long benefited from copies of the social system, and the most famous clone of the Russian-speaking segment of the Internet is a social network Vkontakte.

Gladchenko O.R., El adviser

## EXPERT SYSTEM

Kovalenko Katya, *IT-71*

In artificial intelligence, an expert system is a computer system that emulates the decision-making ability of a human expert. Expert systems are designed to solve complex problems by reasoning about knowledge, like an expert, and not by following the procedure of a developer as is the case in conventional programming. The first expert systems were created in the 1970s and then proliferated in the 1980s. Expert systems were among the first truly successful forms of AI software. An expert system has a unique structure, different from traditional programs. It is divided into two parts, one fixed, independent of the expert system: the inference engine, and one variable: the knowledge base. To run an expert system, the engine reasons about the knowledge base like a human. In the 80's a third part appeared: a dialog interface to communicate with users. This ability to conduct a conversation with users was later called "conversational".

Automating a vast knowledge, the developer may meet a classic problem: "combinatorial explosion" that greatly complicates his work and results in a complex and time consuming program. The reasoning expert system does not encounter that problem since the engine automatically loads combinatorics between rules. This ability can address areas where combinatorics is enormous: highly interactive or conversational applications, fault diagnosis, decision support in complex systems, educational software, logic simulation of machines or systems, constantly changing software.

The inference engine is a computer program designed to produce a reasoning on rules. In order to produce reasoning, it is based on logic. There are several kinds of logic: propositional logic, predicates of order, epistemic logic, modal logic, temporal logic, fuzzy logic, etc. Except propositional logic, all are complex and can only be understood by mathematicians, logicians or computer scientists. Propositional logic is the basic human logic expressed in the syllogism. The expert system that uses that logic is also called zero-order expert system. With logic, the engine is able to generate new information from the knowledge contained in the rule base and data to be processed.

The engine has two ways to run: batch or conversational. In batch, expert system has all the necessary data to process from the beginning. For the user, the program works as a classical program: he provides data and receives results immediately. Reasoning is invisible. The conversational becomes necessary when the developer knows he can't ask the user all the necessary data at the start, the problem being too complex. The software must



“invent” the way to solve the problem, request the user missing data, gradually, approaching the goal as quickly as possible.

Expert systems address areas are enormous, for example: 1) highly interactive or conversational applications, voice server; 2) fault diagnosis, medical diagnosis; 3) decision support in complex systems, process control, interactive user guide; 4) educational and tutorial software; 5) logic simulation of machines or systems; 6) knowledge management; 7) constantly changing software. They can also be used in software engineering for rapid prototyping applications (RAD).

Any program containing expert knowledge and classic programming always begins with an expert interview. A program written in the form of expert system receives all the specific benefits of expert system: it can be developed by anyone without computer training and without programming languages. But this solution has a defect: expert system runs slower than a traditional program because it consistently “thinks” when in fact classic software just follows paths traced by the programmer.

Expert systems are designed to solve tasks in the fields of accounting, medicine, process control, financial service, production, human resources. Typically, the problem area is complex enough that a more simple traditional algorithm cannot provide a proper solution. The foundation of a successful expert system depends on a series of technical procedures and development that may be designed by technicians and experts. Expert systems do not typically provide a definitive answer, but provide probabilistic recommendations.

The building, maintaining and development of expert systems is known as knowledge engineering. Knowledge engineering is a “discipline that involves integrating knowledge into computer systems in order to solve complex problems normally requiring a high level of human expertise”. There are generally three individuals having an interaction in an expert system. Primary among these is the end-user, the individual who uses the system for its problem. In the construction and maintenance of the system there are two other roles: the problem domain expert who builds the system and supplies the knowledge base, and knowledge engineer who assists the experts in determining the representation of their knowledge, enters this knowledge into an explanation module and who defines the inference technique to solve the problem. Usually the knowledge engineer will represent the problem solving activity in the form of rules.

S.V.Podolkova – *EL Adviser*

## SOME ASPECTS OF PORTFOLIO OPTIMIZATION

Y.I.Leshchenko – *group F-73*

I.A.Morozova – *EL Adviser*

Modern portfolio theory is a theory of investment which attempts to maximize portfolio expected return for a given amount of portfolio risk, or equivalently minimize risk for a given level of expected return, by carefully choosing the proportions of various assets. This theory is widely used in practice in the financial industry and several of its creators (Markowitz, Sharpe) won a Nobel memorial prize for the theory.

Modern portfolio theory is a mathematical formulation of the concept of diversification in investing, with the aim of selecting a collection of investment assets that has collectively lower risk than any individual asset. That this is possible can be seen intuitively because different types of assets often change in value in opposite ways. For example, to the extent prices in the stock market move differently from prices in the bond market, a collection of both types of assets can in theory face lower overall risk than either individually. But diversification lowers risk even if assets returns are not negatively correlated—indeed, even if they are positively correlated.

More technically, modern portfolio theory models an assets return as a normally distributed function (or more generally as an elliptically distributed random variable), defines risk as the standard deviation of return, and models a portfolio as a weighted combination of assets, so that the return of a portfolio is the weighted combination of the assets returns. By combining different assets whose returns are not perfectly positively correlated, investors seek to reduce the total variance of the portfolio return.

We can see the advantages of portfolio optimization on the Russian Trade System data example.

We analyzed stock prices data of the 6 companies for one year time period. Rates of return of these companies are given in the table below.

Table 1 – Financial instruments' profitability

Financial instrument	Rate of return, %
URKA	47,1755
ROSN	17,5588
GAZP	21,3941
GMKN	28,6155
LKOH	10,9937
SBER	24,4289

There are two main different approaches for portfolio optimization: Markowitz and Sharpe models.

If we set the required rate of return at 25 %, we can describe stock distribution of the portfolio and its risk in the next table.

Table 2 – Risk minimization of the portfolio

Shares of securities in portfolio	Equally distributed portfolio	Optimal portfolio by Markowitz	Optimal portfolio by Sharpe
1 (URKA)	0,16666	0,11708	0,06991
2 (ROSN)	0,16666	0,00000	0,00000
3 (GAZP)	0,16666	0,00000	0,00000
4 (GMKN)	0,16666	0,00000	0,05317
5 (LKOH)	0,16666	0,15349	0,09020
6 (SBER)	0,16666	0,72942	0,78672
Portfolio variance, %	12,07	9,65	10,04

The practical aprobation of these two models shows that investor will receive better results using Markowitz model.

Dependence between risk and rate of return of the portfolio is graphically represented in the next picture.

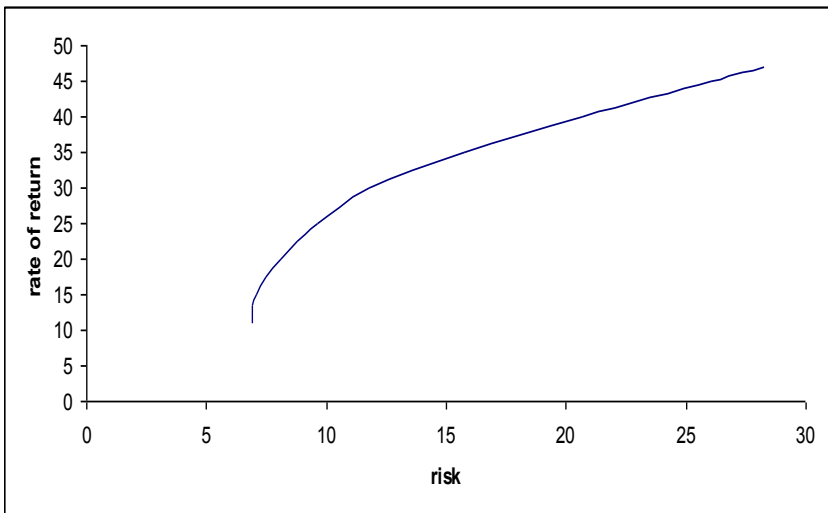


Figure1 – Dependence between the portfolio risk and profitability

## SUCCESSFUL AND KNOWN COMPANY MICROSOFT

Levchenko A.V., *student E-72*

Microsoft Corporation— one of the largest transnational companies on the production of software for the different sort of the computing engineering — personal computers, playing prefixes, mobile telephones and other.

Products of Microsoft are for sale more than in 80 countries of the world, the programs are translated more than into 45 languages. Microsoft is under surveillance of court as a result of world agreement 2002 years.

In 1983 Allen abandoned Microsoft, selling the actions for \$10 for a thing. This transaction in the total did him one of the richest people in the world: in 2011 he occupied 57 places in the list of magazine of Forbes with a capital in \$13 milliards

The actions of Microsoft are up-diffused as follows: 7,55 % belongs to Bill Geysu, To Steve Balmeru — 4,66 %, there is a less than percent on other managers of corporation, and other securities are in free circulation on the exchange of NASDAQ: MSFT. Market capitalization of company on May, 2010 is \$247,23 milliards.

An unexecutive chairman of board of directors of company is Bill Geys.

In May, 2011 «Microsoft» declared the purchase of the company Skype Limited specialized on internet-telephony for \$8,5 milliards. The salespeople of actions will be become by the founders of «Skype» and row of investment funds. After completion of absorption, as expected, on a base Skype Limited will be created subdivision of Microsoft Skype Division, thus present director Skype Beyts will remain Tony his leader.

Company «Microsoft» pays much attention to questions of preservation of environment. It is very important to introduce ecological principles in each aspect of activity of the company, therefore in «Microsoft» concept covering important ecological questions in all complex - from administrative business processes before manufacture, from processes of working out of harmless production before personnel training has been developed.

The company pays a lot of attention to questions of preservation of the environment. It is very important to implement an environmental principles in every aspect of the company's activities.

Gladchenko O.R., *EL adviser*

## THE RELATIONSHIP BETWEEN DESIGN AND PRODUCTION

Nesterenko Y.V., *student E-72*

Design is what links creativity and innovation. It shapes ideas to become practical and attractive propositions for users or customers. Design may be described as creativity deployed to a specific end.

The highly skilled creative people working in design and production plan, construct and organize all the physical details of the play's environment. All the scenery and furniture and some of the props used in the production are the results of the set designer's vision.

The relationship between design and production is one of planning and executing. In theory, the plan should anticipate and compensate for potential problems in the execution process.

Design involves problem-solving and creativity. In contrast, production involves a routine or pre-planned process. A design may also be a mere plan that does not include a production or engineering process, although a working knowledge of such processes is usually expected of designers.

In some cases, it may be unnecessary and/or impractical to expect a designer with a broad multidisciplinary knowledge required for such designs to also have a detailed specialized knowledge of how to produce the product. Design and production are intertwined in many creative professional careers, meaning problem-solving is part of execution and the reverse. As the cost of rearrangement increases, the need for separating design from production increases as well.

For example, a high-budget project, such as a skyscraper, requires separating (design) architecture from (production) construction. A Low-budget project, such as a locally printed office party invitation flyer, can be rearranged and printed dozens of times at the low cost of a few sheets of paper, a few drops of ink, and less than one hour's pay of a desktop publisher.

This is not to say that production never involves problem-solving or creativity, nor that design always involves creativity.

Designs are rarely perfect and are sometimes repetitive.

The imperfection of a design may task a production position (e.g. production artist, construction worker) with utilizing creativity or problem-solving skills to compensate for what was overlooked in the design process. Likewise, a design may be a simple repetition (copy) of a known preexisting solution, requiring minimal, if any, creativity or problem-solving skills from the designer.

Gladchenko O.R., *EL adviser*

## LANGUAGE DEATH

Olena Yevtushenko, *JT-71*

By now, it is well documented that languages are vanishing at a rate that has never been seen before. Since 1500 AD, the world has lost about 15% of the languages we think were spoken then, and the pace is quickening dramatically. We can definitely state that at least half of the 6,800 contemporary living languages will disappear by 2050. There were cases when each week a language ‘died’ somewhere on the planet and this trend is considered normal. Now the figure is growing exponentially. Over the next century, about 6,200 languages, dialects and subdialects can disappear from circulation. And it’s not just the little languages that are dying. A hundred years ago, Breton had a million speakers, but is now struggling for survival. Thirty years ago, Navajo had over 100,000 speakers and now faces an uncertain future.

The most recent example is the Chulym language, which had been found in the half-dead state. Today this language is used by about 40 people in central Siberia, and all native speakers are at least 50 years old. The distinct features of the language are its grammar rules: for example, the construction of sentences containing negation, or forms of interrogative sentences. You see, every language has its own ecosystem, and we have no right to destroy these areas. For example, speakers of this newly-discovered Chulym language practice hunting, collecting, and fishing — all that our ancestors did thousands of years ago. They have their legends, folklore, are brilliantly versed in medical herbs. But in a few years, there will be no language, it will disappear forever.

Since merely saying that a language is "endangered" can be ambiguous, it is needful to define levels of endangerment. They are:

1. Potentially endangered – lack of prestige in the home country, economic deprivation, language not being passed on in the education system.
2. Endangered – youngest fluent speakers are young adults.
3. Seriously/severely endangered – youngest speakers are 50 years of age and older.
4. Moribund – a tiny portion, mostly the very age, remain as speakers of the language.
5. Extinct – no remaining speakers of the language.

We recognize easily the danger in losing biodiversity, but is the loss of language – and thus cultural – diversity really a problem? For all we know, one language and one culture might be just fine. Of the 6000 languages spoken today, fewer than 300 cover 5.5 billion speakers. All the rest of the languages, 95% of them, are spoken by just 300 million people.

Think of it: 5% of the people in the world speak 95% of the world's languages, which means that 95% of the cultural heterogeneity of the planet – 95% of the *differences* in ways of seeing the world – is vested in under 5% of the people, and the problem gets worse each year.

It's not only the loss of a language, it is also the death of an ethnic group. This is very dangerous in terms of culture, because we lose the knowledge related to traditions, models of philosophy rooted in human consciousness. It is bad from the scholar's point of view, since we cease to understand how the processes of perception of the world through language is organized.

The reasons for the disappearance of languages can be described as ethnic wars and genocide, natural disasters, the assimilation of small ethnic groups and their transition to the dominant languages, including English, French, Chinese, and Russian in their respective areas. Monster states are not interested in the development of minority languages.

According to UNESCO, a language may be transmitted from generation to generation, when the number of its speakers is no less than 100,000. Currently, the Eyak language of indigenous inhabitants of Alaska is used by only one inhabitant of the same state, the Udege dialect of Siberia is spoken by about 100 people, and only six Brazilian Indians language communicate in their tribe's Arikapu language. You see, the statistics are sad. Interestingly, more than half of all the world's languages are found in just eight countries: Papua New Guinea, Indonesia, Nigeria, India, Mexico, Cameroon, Australia and Brazil.

But despite the languages' deaths, the reverse process is also happening. So Hebrew was once revived and is now spoken by more than five million Israelis. Over 10,000 people in Hawaii speak their native language, almost forgotten just a decade ago; Mexicans want to restore lost languages of the Mayan tribes, and New Zealanders do it with the Maori language. But the proportion of the dead languages to the revived is catastrophic.

Linguists are recording texts by the last speakers of languages across the world. Linguists are also helping indigenous peoples to write dictionaries and grammar books so that school children who are participating in bilingual education programs will have basic tools for learning their languages. Speakers of Mayan and other indigenous languages are getting degrees in linguistics and joining the effort to document those languages.

There is one more thing that works. Most languages have no literary tradition. In today's, world, no books means language death. This is the goal of CELIAC, the *Centro Editorial de Literatura Indígena, Asociación Civil* or the Center for Native Language Publishing, in Oaxaca, Mexico.

I.A. Bashlak – *EL-adviser*

## TEST AUTOMATION FOR WEB APPLICATIONS

V.Petrenko, *student IT-71*

Most software applications today are written as web-based applications to be run in Internet browser. The effectiveness of these applications testing varies widely among companies and organizations. In the era of highly interactive and responsible software processes when a lot of organizations use some forms of Agile methodology, test automation is becoming a current requirement for software projects. Test automation often gives the answer. This process means using a software tool to run repeatable tests against the application to be tested. It provides quality of regression testing.

Test automation has a lot of advantages. Most of them are related to the repeatability of tests and the speed at which tests can be done. There are a number of commercial and open source tools available for assisting in the development of test automation. Selenium is possibly the most widely-used open source solution.

Test automation has some special advantages for improving the long-term efficiency of software team's testing processes. Test automation supports fast regression testing, rapid feedback to developers, virtually unlimited iterations of test case doing, support for Agile and extreme development methodologies, disciplined documentation of test cases, customized defect reporting, finding defects missed by manual testing.

It is not always useful to automate test cases. In some cases manual testing may be more appropriate. For instance, if the application user's interface changes considerably in the nearest future, any automation might need to be rewritten anyway. Also, sometimes there is simply not enough time to build test automation. For the short term, manual testing may be more effective. If an application has a very tight deadline and there is no test automation available, and you need to do testing within that time frame, then manual testing is the best solution.

Selenium is a set of different software tools, each of them has different approach to supporting test automation. Most Selenium QA Engineers focus on the tools that meet the needs of their project best of all. However, learning these tools will give you a lot of different options for approaching different test automation problems. The entire suite of tools results in a rich set of testing functions particularly suitable for the needs of all types web applications testing.

S.V.Podolkova – *EL Adviser*



## COMPUTER AIDED DESIGNING OF TURBINE COMPRESSORS

E.Ponomarenko, *student IT-71*

One of the promising trends in the of computer technology application is an educational scope. An important step to make learning process more effective is the physical experiment, which stimulates active cognitive and creative approach to getting knowledge. In traditional forms of learning such possibility is realized through the implementation of the necessary laboratory work or hands-on sessions. Replacing the real (often outdated and faulty) laboratory stands is conducted in virtual labs and helps receive diverse knowledge in use of various computer technologies.

The main purpose of our work is the development of information system on disciplines "Turbine compressors" and "Designing of Turbo machines". This is an example of the introduction of computer technology in teaching. To do laboratory work students must use their knowledge on designing compressor and basic PC skills (working with peripherals, windowed interface and file systems).

Information system is a hardware and software system designed to automate the end-user focused activities, providing, in accordance with used in its processing logic, the possibility of obtaining, modifying and storing information. The main objectives of the information system are calculation of dependency graph and the dimensional gas dynamics characteristics of centrifugal compressor. The interface of the programme is quite simple for the students.

The compressor parameters and characteristics have been developed using some methods and procedures for all calculations. Also a simple interface, which makes usage of this programme easy enough, was designed. The knowledge domain was also researched.

After studying of the subject area and learning algorithms, calculations showed that, mathematic operations on a computer are necessary to explore the same volume of material in much shorter period of time. Specific methods and procedures were developed for all calculations of the characteristics and parameters of a compressor. Also an intuitive interface making the program easy and comfortable was developed. Designing of the information system resulted in the investigation of the task and role relevance of the information system in the learning process; examination of the knowledge domain for information system.

S.V. Podolkova – *EL Adviser*

# **GEOGRAPHIC INFORMATION SYSTEMS AS AN INTEGRATED DECISION SUPPORT TOOL FOR MUNICIPAL INFRASTRUCTURE ASSET MANAGEMENT**

I. Shishov - *student IT-71*

The three-year Municipal Infrastructure Investment Planning (MIIP) project is currently investigating investment planning and strategic asset management. The project proposes the use of geographic information systems (GIS) as the framework for decision support tools for municipal infrastructure managers, and more specifically, as tools to assist them to prioritize infrastructure maintenance and capital renewal.

GIS helps store, manage, analyse, manipulate and display data that are linked spatially. In fact, GIS relates database records and their associated attribute data to a physical location in "real" world coordinates, thereby creating a "smart map". Visualization of discrete parts of these data on a GIS map is possible by layering the data into different "themes". GIS applications can then display the intersection of various "themes". Typically, GIS applications in use today in municipalities primarily assist administrative functions; however, municipalities are recognizing the benefits of spatially related data to manage their municipal infrastructure assets. GIS data represents real objects (such as roads, land use, elevation, trees, waterways, etc.) with digital data determining the mix. Real objects can be divided into two abstractions: discrete objects (e.g., a house) and continuous fields (such as rainfall amount, or elevations). Traditionally, there are two broad methods used to store data in a GIS for both kinds of abstractions mapping references: raster images and vector. Points, lines, and polygons are the stuff of mapped location attribute references. A new hybrid method of storing data is that of identifying point clouds, which combine three-dimensional points with RGB information at each point, returning a "3D colour image". Then GIS thematic maps are becoming more and more realistically visually descriptive of what they set out to show or determine. Shortcomings of using GIS for managing municipal infrastructure include the high costs of data conversion, the lack of strong 3D capabilities, no ability to store "time-dependent" data, and the lack of object-oriented representation. The major opportunity for GIS for an organization is to create an "Enterprise GIS" solution where data, information and knowledge can be shared and flow freely throughout the enterprise and potentially to the general public.

S.V. Podolkova – *EL Adviser*

## PROGRAM COMPLEX ANASYS

R. V. Shulga – *group KM-71*

Program Complex ANSYS includes four main softwares. They are: 1) Fluid Dynamics; 2) Structural Mechanics; 3) Electromagnetic; 4) Systems and Multiphysics.

ANSYS Fluid Dynamics consists of ANSYS CFX and ANSYS Fluent. This software can be useful for:

- 1) Improving aerodynamics and ventilation in aircraft, cars and buildings; cutting energy costs and improving comfort and safety;
- 2) Designing more-efficient and longer-lasting turbines, from huge hydroturbines to turbochargers and heart pumps;
- 3) Creation better-functioning solutions in alternative energy such as wave power, wind turbines and fuel cells.

ANSYS structural mechanics software brings together the largest elements library with the most advanced structural simulation capabilities available. This unified engineering environment help you streamline processes to optimize product reliability, safety and functionality.

ANSYS Electromagnetics software can help you to predict the behavior of complex electrical and electromechanical systems — from mobile communication and internet devices to automotive components and electronics equipment. This software can be useful for improving equipment performance of smartphones, satellites, batteries and hybrid vehicles.

ANSYS Systems & Multiphysics can be useful for accurate tracking of the interactive effects of components and detailing how they will perform as a whole; modeling scalability for evaluating entire systems that include any combination of high-fidelity 3-D and reduced-order models and others.

Now to describe ANSYS software because I used it in my bachelor work. ANSYS CFX software is fully integrated into the ANSYS® Workbench™ environment, the framework for the full suite of engineering simulation solutions from ANSYS. Its adaptive architecture enables users to easily set up anything from standard fluid flow analyses to complex interacting systems with simple drag-and-drop operations. If you want to solve complicated problems in ANSYS CFX, you need to create geometry of the body and mesh of the body. The next step is to set up entry and boundary conditions in ANSYS Pre-processor; then you need to choose the way your computer will solve the problem (or the task) in ANSYS CFX Solver and after that you can look through the results.

D. O. Marchenko – *EL adviser*

## PASSIVE HOUSE

O. Shulyma - *student IT-71*

The term passive house (Passivhaus in German) refers to the rigorous, voluntary Passivhaus standard for energy efficiency in a building, reducing its ecological footprint.

Passive house is ultra-low energy buildings that require little energy for space heating or cooling.

The standard is not limited with residential properties; several office buildings, schools, kindergartens and a supermarket have also been constructed to the standard. Passive design is not an attachment or supplement to architectural design, but a design process that is integrated with architectural design.

The Passivhaus standard originated from a conversation in May 1988 between Professor Bo Adamson of Lund University, Sweden, and Professor Wolfgang Feist of the Institut für Wohnen und Umwelt (Institute for Housing and the Environment, Germany). Their concept was developed through a number of research projects, aided by financial assistance from the German state of Hessen.

By achieving the Passivhaus standards, qualified buildings are able to dispense with conventional heating systems. While this is an underlying objective of the Passivhaus standard, some type of heating will still be required and most Passivhaus buildings do include a system to provide supplemental space heating. This is normally distributed through the low-volume heat recovery ventilation system that is required to maintain air quality, rather than by a conventional hydronic or high-volume forced-air heating system, as described in the space heating section below.

Achieving the major decrease in heating energy consumption required by the standard involves a shift in approach to building design and construction. Design is carried out with the aid of the 'Passivhaus Planning Package' (PHPP), and uses specifically designed computer simulations.

To achieve the standards, a number of techniques and technologies are used in combination: passive solar design and landscape, superinsulation, advanced window technology, air tightness, ventilation.

S.V.Podolkova – *EL Adviser*

## MONEY AND ITS FUNCTIONS

M.V. Shvydka – *group F-73*

I.A. Morozova – *EL Adviser*

Even if you had all the other resources available to you, it still takes money to start a business.

Although the crucial feature of money is its acceptance as the means of payment or medium of exchange, money has other functions. It serves as a standard of value, a unit of account, a store of value and a standard of deferred payment.

Money, the medium of exchange, is used in one-half of almost exchange. We accept money not to consume it directly but because it can subsequently be used to pay things we do wish to consume. Money is the medium through, which people exchange goods and services.

Money can also serve as a standard of value. Society considers it convenient to use a monetary unit to determine relative costs of different goods and services. In this function money appears as the unit of account, is the unit in which prices are quoted and accounts are kept. In Russia prices are quoted in rubles; in Britain, in pounds sterling; in the USA, in US dollars; in France, in French francs. It is usually convenient to use the units in which the medium of exchange is measured as the unit of account as well.

Money is a store of value because it can be used to make purchases in the future. To be accepted in exchange, money has to be a store of value. Nobody would accept money as payment for goods supplied today if the money was going to be worthless when they tried to buy goods with it tomorrow. But money is neither the only nor necessarily the best store of value. Houses, stamp collections, and interest-bearing bank accounts all serve as stores of value. Since money pays no interest and its real purchasing power is eroded by inflation, there are almost certainly better ways to store value. Finally, money serves as a standard of deferred payment or a unit of account over time.

Finally, money serves as a standard of deferred payment or a unit of account over time. When you borrow, the amount to be repaid next year is measured in some other hard currency. Although convenient, this is not an essential function of money.

Thus the key feature of money is its use as a medium of exchange. For this, it must act as a store of value as well. And it is usually, though not invariably, convenient to make money the unit of account and standard of deferred payment as well.

## SONY ERICSSON COMPANY

Semydotska I.I., *student E-72*

Sony Ericsson is one of the top, global mobile phone manufactures, which serves the worldwide communications market with innovative and feature-rich mobile-phone.

History of this company started in 1849 with start-up of Ericsson company.

SE, a 50/50 joint venture between Sony and Ericsson, celebrated its 10<sup>th</sup> anniversary on 1<sup>st</sup> of October 2011.

The first joint products were announced in March 2002.

SE has a total workforce of approximately 7600 people. Its global corporate functions are located in London and the company has operations in major markets around the world. The four research and product development sites are located in Tokyo, Japan; Beijing, China; Lund, Sweden; Silicon Valley, USA.

SE doing everything to making mobile-phones environmentally friendly throughout their entire life cycle. That's why Green Heart is the result of years of research to bring phones that offer you a greener choice.

Sony Ericsson has phased out all PVC in our products and nearly all halogenated flame retardants to date.

Sony Ericsson do not directly purchase raw materials such as tin, tantalum, tungsten or gold, but company purchases components that may contain these metals.

SE believes that mobile technology and communications bring new opportunities to people. They are associated with a number of social support project events and humanitarian activities around the world, including helping in disaster relief.

Also SE cooperates with the Federation International Football Association (FIFA), UEFA Champions League and Woman's Tennis Association (WTA) and Facebook.

Its slogan always say: "Actions speak louder than words. We just don't talk, we live it".

Main philosophy of this company is "Make. Believe". It means turning your dreams into reality.

And finishing my story, I want to add, that SE products have high quality and it's are valley for money. So that is why SE is company of future.

Gladchenko O.R., *EL adviser*

## **THE INFLUENCE OF COMPUTER GAMES DEVELOPMENT ON THE PEOPLE'S CREATIVITY**

V. Zakharchenko, *student IT-71*

Creativity is regarded as one of the most important skills. It is essential in building a well-rounded personality and tolerant view of the world. Previous researchers and authors denied creativity as a static trait and convincingly acknowledged it as having vast opportunities to be improved.

Since creativity is a learnable skill, computer games development was used as a tool to attract students. The rationale of this action was computer games correspondence to young generation's habits and interests. Computer games development is one of the ideal ways of influence upon students who have grown up as the play station generation. Researches carried out by Yee indicated that on average, youth spent 22 hours on computer games per week, and 70% of them spent at least 10 long hours in a virtual world at one session. As a result, it has become rather difficult to ignore the fact of computer games as the important part of contemporary culture of today's youth. Therefore, educational practitioners recommended to use computer games within meaningful learning environment to promote learning and students' self-development. However, most schools in Asian countries are traditionally regarded as social institutions where teachers transmit standardized knowledge with chalk and talk method. The current norm not only seriously holds back students from exploring new ideas and being creative, but also being considered as dull and uninteresting by students. Egenfeltd-Nielsen offered moving towards a new generation of educational use of computer games that covers a broader scope and can be a task beyond information transmitter that is capable to meet the needs of this play station generation. After serious discussions concerning the requirements of time, finances, equipment, students' current cognitive abilities and expertise resources, this study had come to Game Maker as the best solution tool for lower secondary students in developing their own computer games. Game Maker provides a simple game developing environment. Students were expected to possess the abilities to create completed games without being an expert in traditional programming languages. The schools' computers fulfilled the Game Maker's requirement for them to run the games efficiently and most successfully. No doubt, the use of Game Maker will help to raise the level of creative potential among students throughout the world.

S.V.Podolkova – *EL Adviser*

## HISTORY OF BRAND ASUS

Rizenko O.I., *student E-71*

Company ASUS name occurs from a word "Pegas" - so called a winged horse from Ancient Greek mythology, an inspiration symbol in creativity and a science. Name ASUS personifies force, spirit of creativity and cleanliness with which at modern generation this regal and courageous mythical hero associates. With each new product, companies ASUS obey all new tops in quality and innovations.

Laptops ASUS have proved to be from the best party, working in the most difficult conditions and in the most exotic corners of our planet.

Company ASUS - the largest manufacturer of motherboards possessing the biggest share of the world market (about 40 %). Today the motherboard of manufacture ASUS equips every third computer in the world. In 2008 in the world it has been sold over 24 million motherboards ASUS: if to establish them against each other their total height will be in 10 thousand times more, than height of well-known skyscraper Taipei 101 and in 600 times above the Everest.

The ideology of brand ASUS is based on four positions: "Five advantages - modesty, honesty, diligence, speed and boldness", "Orientation to result", "Innovativeness and an esthetics" and "Economical thinking". To reach the global purpose of the company - to become the leader of a new digital era - employees ASUS put these fundamental positions into practice.

For achievement of the best results ASUS learns the employees to consider a situation entirely, analyzing possible results before acceptance of any actions. Behind each task it is necessary to see its purpose, behind each consequence - its reason. It will allow to make from the first attempt the correct decision. To reach it, it is necessary to start the task, remembering its purpose, to consider a situation from the point of view of the client, to consider efficiency of expenses, to be opened for perception of alternative decisions and to realize by-effects of the chosen decision.

For creation of as much as possible useful products for the clients company ASUS is necessary on strategy of "Economical thinking" (Lean Thinking). Combining elements of corporate culture with principles "Six sigma", strategy of "Economical thinking" demands from all who works in ASUS, uses of methods of direct communications between employees of all levels, maximizations of efficiency of each link of an industrial chain, decrease in expenses and losses and constant search of ways of improvement of administrative processes.

Gladchenko D. O., *EL adviser*



## LEUCHTDIODE

Grischtschuk O. *Student der Gruppe EII-71*  
I. Sajzewa, *Berater der deutschen Sprache*

Eine Leuchtdiode ist ein elektronisches Halbleiter-Bauelement. Fließt durch die Diode Strom in Durchlassrichtung, so strahlt sie Licht, Infrarotstrahlung (als Infrarotleuchtdiode) oder auch Ultraviolettstrahlung mit einer vom Halbleitermaterial und der Dotierung abhängigen Wellenlänge ab.

### ***Funktionsprinzip***

Der Halbleiterkristall vieler LEDs ist auf den Boden einer kegelförmigen Vertiefung in einem Metallhalter gelötet. Die Innenseiten der Vertiefung wirken als Reflektor für das aus den Seiten des Kristalls austretende Licht. Die Lötstelle bildet einen der beiden elektrischen Anschlüsse des Kristalls. Gleichzeitig nimmt er die Abwärme auf, die entsteht, weil der Halbleiterkristall nur einen Teil der elektrischen Leistung in Licht umsetzt. Der Halter mit dem Reflektor ist bei bedrahteten LEDs als rechteckiger Draht ausgeführt, der als elektrischer Anschluss dient. Anders als sonst bei Elektronik Bauteilen üblich, besteht der Anschlussdraht nicht aus verzinnem Kupfer, sondern aus verzinnem Stahl. Die Wärmeleitfähigkeit von Stahl ist vergleichsweise gering. Dadurch wird der Halbleiterkristall beim Einlöten des Bauteils in eine Leiterplatte nicht überhitzt.

Ein dünner Bonddraht stellt den zweiten elektrischen Anschluss des Halbleiterkristalls her. Er verbindet einen weiteren Stahldraht mit der Oberseite des Kristalls. Auf diese Weise wird möglichst wenig Licht vom Anschluss absorbiert. Die Kathode (-) ist durch eine Abflachung rechts am Gehäusesockel markiert. Bei fabrikneuen LEDs ist zudem der Anschluss der Kathode kürzer (Merkregel: Kathode = kurz = Kante). Bei den meisten LEDs ist der Reflektor die Kathode(-), dann gilt auch die Merkregel, dass die (technische) Stromrichtung von dem Pfeil, den die Anode (+) durch ihre Form bildet, „angezeigt“ wird. In seltenen Fällen ist der Aufbau umgekehrt.

### ***Spektrale Charakteristik***

Anders als Glühlampen sind Leuchtdioden keine thermischen Strahler. Sie emittieren Licht in einem begrenzten Spektralbereich, das Licht ist nahezu monochrom. Deshalb sind sie beim Einsatz als Signallicht besonders effizient im Vergleich zu anderen Lichtquellen, bei denen zur Erzielung einer monochromen Farbcharakteristik Farbfilter den größten Teil des Spektrums absorbieren müssen. Für die Verwendung von LEDs werden meist blaue LEDs mit Leuchtstoffen kombiniert.

## THE EXCESS BURDEN OF TAXATION

U. V. Kolomiiec, *group F-73*

The excess burden of taxation is the efficiency cost, or deadweight loss, associated with taxation. The total economic burden of a tax includes both payments that taxpayers make to the government and any lost economic value from inefficient activities undertaken in reaction to taxes. Since direct tax burdens take the form of revenue that taxpayers remit to governments, the excess burden of taxation is the magnitude of the economic costs of accompanying economic distortions. For example, a tax on labor income typically discourages work by encouraging inefficient substitution of untaxed leisure for taxed paid work. At low tax rates this substitution entails only modest excess burdens, since, in the absence of other distortions, the welfare cost of substituting an untaxed for a taxed activity simply equals the tax rate, the difference between pretax and after-tax returns to the taxed activity. At high tax rates this difference is quite large, and as a result, residents of economies with high tax rates may face substantial excess burdens of taxation. Indeed, it is entirely possible for the excess burden of a tax to exceed the revenue collected; a tax imposed at so high a rate that it eliminates the taxed activity clearly has this feature.

The excess burden of taxation is commonly measured by the area of the associated “Harberger triangle” (Hines, 1999). The base of the Harberger triangle is the amount by which economic behavior changes as a result of price distortions introduced by the tax, and the height of the Harberger triangle is the magnitude of the tax burden per unit of economic activity.

Consider the adjacent graph, which shows the impact of a unit tax of  $\$T$  in a competitive market. Initially, the equilibrium price is  $P$ , and the equilibrium quantity is  $Q$ . The imposition of the tax causes the equilibrium quantity to fall by  $\Delta Q$ , and the price to consumers increases by  $\Delta P_d$  while the price to sellers falls by  $\Delta P_s$ . The efficiency loss of the tax is given by the sum of the two triangles labeled  $A$  and  $B$  on the diagram.

For convenience, call the efficiency loss  $Z$ , so  $Z = A + B$ . As stated in the text, the size of this loss increases with the elasticities of either supply or demand. This note will develop a formula for the size of the efficiency loss so that we may show the dependency of this area on the two elasticities.

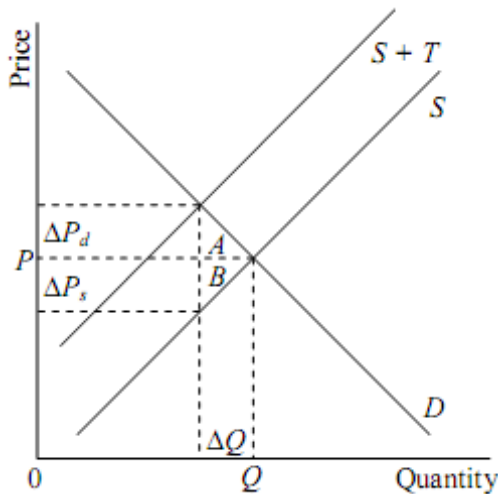
We begin by noting that the area of a triangle is one half the base

times the height. In this example, each triangle has base equal to  $\Delta Q$ . Triangle  $A$  has height  $\Delta P_d$ , while triangle

$B$  has height  $\Delta P_s$ . The efficiency loss is therefore  $Z = A + B = 1/2\Delta Q\Delta P_d + 1/2\Delta Q\Delta P_s = 1/2\Delta Q(\Delta P_d + \Delta P_s) = 1/2\Delta QT$ . This last equality follows because the tax,  $T$ , must be the difference between the price paid by consumers and the price received by sellers.

We saw earlier how taxes on goods and services of businesses can change the demand by citizens, supply, and equilibrium price and quantity. Taxes provide revenues to the government and are usually paid by both buyers and sellers. To see the welfare effect of taxes, we need to compare the revenue received by the government, and the dead weight loss (also known as "excess burden" or "distortionary cost") to the consumers and producers.

The excess burden of taxation is the efficiency cost, or deadweight loss, associated with taxation. Excess burden is commonly measured by the area of the associated Harberger triangle, though accurate measurement requires the use of compensated demand and supply schedules. The generation of empirical excess burden studies that followed Arnold Harberger's pioneering work in the 1960s measured the costs of tax distortions to labor supply, saving, capital allocation, and other economic decisions. More recent work estimates excess burdens based on the effects of taxation on more comprehensive measures of taxable income, reporting sizable excess burdens of existing taxes.



D.O.Marchenko, *EI Advisor*

## MCDONALD'S UKRAINE COMPANY

Kolontaevskaya A.V., *student E-72*

The company was founded in 1940 by brothers Dick and Mac McDonald (the first restaurant was opened in San Bernardino, California) in 1948, the world's first formulated the principles of the concept of "fast food".

In 1954, Ray Kroc bought McDonald brothers to act as exclusive agent for the franchise. In 1955 he opened his first McDonald's in the town of Des Plaines, Illinois (now - a museum of the corporation). In 1955, the company was registered as a McDonald's System, Inc (in 1960 was renamed the McDonald's Corporation).

McDonald's has become a model of fast service.

Today, tens of thousands of McDonald's restaurants are serving millions of people daily around the world. Ukraine became the 102 th country where McDonald's began to develop Network . May 24, 1997 near the metro station "Lukyanivska" in Kiev opened the first McDonald's institution in the country. Today in 20 cities of Ukraine operates 68 McDonald's establishments. Every day, McDonald's serves more than 200,000 visitors.

The priority focus of the company "McDonald's Ukraine Ltd." is a continuation of the fruitful cooperation with existing and attract new Ukrainian partners and suppliers.

Key partners "McDonald's Ukraine ltd" are "Chumak", "Coca-cola", "Hochland", "Kraft Foods" and other.

The company "McDonald's Ukraine ltd" is one of the largest foreign investors in Ukraine in developing a network of McDonald's ® and infrastructure of our state has company already invested over \$ 100 million.

During 1997-2006 years the company has paid 333 million in the form of taxes to the state and local budget.

According to the annual independent survey company Aon Hewitt and HR Center, the company " McDonald's Ukraine ltd " occupied a place in the ranking "Best Employer in Ukraine - 2010". Charity project "Happiness Day at McDonald's" brought company victory in the national contest "Philanthropist of the Year 2011".

It should be noted that McDonald `s, the official restaurant European Championships, was the sixth world-renowned brands - partner of Euro 2012, joining Adidas, Castrol, Coca-Cola, Hyundai-Kia and Carlsberg.

Gladchenko O.R., *EL adviser*

## PROGRAMMABLE LOGIC DEVICES – THE BASE OF ACTUAL ELECTRONICS

Znamenshchykov Y., *student ES-72*

Programmable logic devices (PLD) are designed with configurable logic and flip-flops linked together with programmable interconnect. PLDs provide specific functions, including device-to-device interfacing, data communication, signal processing, data display, timing and control operations, and almost every other function a system must perform. Memory cells control and define the function that the logic performs and how the various logic functions are interconnected. Logic devices can be classified into two broad categories - fixed and programmable. As the name suggests, the circuits in a fixed logic device are permanent, they perform one function or set of functions - once manufactured, they cannot be changed. On the other hand, programmable logic devices (PLDs) are standard, off-the-shelf parts that offer customers a wide range of logic capacity, features, speed, and voltage characteristics - and these devices can be changed at any time to perform any number of functions.

With fixed logic devices, the time required to go from design, to prototypes, to a final manufacturing run can take from several months to more than a year, depending on the complexity of the device. And, if the device does not work properly, or if the requirements change, a new design must be developed. With programmable logic devices, designers use inexpensive software tools to quickly develop, simulate, and test their designs. Then, a design can be quickly programmed into a device, and immediately tested in a live circuit. The PLD that is used for this prototyping is the exact same PLD that will be used in the final production of a piece of end equipment, such as a network router, a DSL modem, a DVD player, or an automotive navigation system. There are no NRE costs and the final design is completed much faster than that of a custom, fixed logic device.

Another key benefit of using PLDs is that during the design phase customers can change the circuitry as often as they want until the design operates to their satisfaction. That's because PLDs are based on re-writable memory technology - to change the design, simply reprogram the device. Once the design is final, customers can go into immediate

production by simply programming as many PLDs as they need with the final software design file. Generally, PLDs can be described as being one of three different types: simple programmable logic devices (SPLD), complex programmable logic devices (CPLD), or field programmable logic devices (FPGA). There are several manufacturers with many different families of PLD devices, so there are many variations in architecture. The two major types of programmable logic devices are field programmable gate arrays (FPGAs) and complex programmable logic devices (CPLDs). The distinction between the two is often a little fuzzy, with manufacturers designing new, improved architectures, and frequently muddying the waters for marketing purposes. Together, CPLDs and FPGAs are often referred to as high-capacity programmable logic devices (HCPLD). The programming technologies for PLD devices are actually based on the various types of semiconductor memory. As new types of memories have been developed, the same technology has been applied to the creation of new types of PLD devices. The amount of logic resources available is the major distinguishing feature between SPLDs and HCPLDs. Today, SPLDs are devices that typically contain the equivalent of 600 or fewer gates, while HCPLDs have thousands and hundred of thousands of gates available. Of the two types of HCPLD devices, FPGAs offer the highest amount of logic density, the most features, and the highest performance. FPGAs are used in a wide variety of applications ranging from data processing and storage, to instrumentation, telecommunications, and digital signal processing. CPLDs, by contrast, offer much smaller amounts of logic - up to about 10,000 gates. But CPLDs offer very predictable timing characteristics and are therefore ideal for critical control applications. Some CPLDs require extremely low amounts of power and are very inexpensive, making them ideal for cost-sensitive, battery-operated, portable applications such as mobile phones and digital handheld assistants.

Pochatko T.V. – *E L Adviser*

## SOCIAL ASPECTS OF TOURISM

N. Ye. Kosolap , *group MK-72*

L.Ya. Khmelik - *EL adviser*

Tourism has become particularly significant in economic growing. Nowadays tourism industry is the main export sector of numerous countries. Besides its importance for economic indexes, socio-cultural aspect must be taken into account when we investigate various features of tourism. It is difficult to pin-point in a short publication all social aspects of tourist business, all problems which are determined by this direction. Aspects of tourism are distinguished as independent values and we try to realize their consequences choosing them as a factor of social change.

The recent research showed that the most frequent terminology used (on English sites) in reference to the tourist products is “responsible” (for 32.7% of the tour operators). This was followed by “sustainable” (7.5%), “ecotourism” (5.6%), “ethical” and “fair trade” terminology (3.7%). The English terminology is easily translated in Spanish where similar phrases have the same sense. For example, *turismo responsable*, *turismo sostenible*, *turismo comunitario*, and *ecoturismo* –all these carry the same meaning as their English language equivalents. Responsible tourism, which began as an innovative idea in the late 1970s has put down deep roots. It maximizes the benefits to local communities, minimizes negative social and environmental effects. Sustainable tourism is no longer a mere concept because it influences all fields of modern society.

In favor of its positive effect obvious reasons can be given: responsible tourism develops relations between hosts and citizens, helps in learning different cultures and customs, reduces negative perceptions and stereotypes, develops friendship and pride, benefits appreciation and understanding, respect and tolerance for each other’s culture; it also improves self-esteem of hosts and tourists. Residents get to know about the outside world without leaving their homes, while their visitors learn about a new culture. Local communities benefit through the contribution tourism by improvement of the social infrastructure like schools, libraries, health institutions, theatres, canteens and so on. Besides, if local culture is the base for attracting tourists to the region, it helps to preserve the local traditions and handicrafts which were on the link of extinction. For example, in Uzbekistan, in such famous regions as Samarkand, Buhara, and Horezm tourists contribute to the preservation of traditional handcrafting wood

carving, hammered copper work, handmade silk and carpets and, of course, architectural and historical monuments. Since Uzbekistan proclaimed its independence in 1991, many museums and monuments were renovated or opened to promote the national culture and traditions. Growing interest in this culture makes the local people proud of their way of life.

However, from the ecological point of view tourism is often more acceptable and preferable than any other industrial production, as it is environmentally safer. In many countries of Asia and the Pacific, for example in the Cook Islands, Samoa and others, tourism is the main source of income and it is at least better than chopping down the forests or destroying coral reefs.

In spite of these pluses there are some minuses in the sphere of tourism. Scientists can't skip the fact that there are also a lot of minds among the members of society towards negative socio-cultural impacts of modern tourism. Most fears surrounding tourism are closely associated with uncontrolled and massed tourism growth. Tourism infrastructure is often accused of taking the "best sites" and local secrets seen as being spectacles and losing their destination appeal. This industry is often considered as the solution to economic problems rather than a diversification of the local economy. It is easy for communities to become reliant on tourism drawing labor away from important industries such as agriculture and manufacture.

It is easy to blame tourism for any economic, social and environmental problems. The reason seems to be the lack of information, false impressions, misinformation, poor communication and poor knowledge. But the truth is in its great value for modern social life of our community. Evidently it is a great challenge to make a profitable business in managing tourism activity somewhere without some negative cause to the local communities. But still it is possible for the tourism industry to cooperate with other industries and bring benefits both to the tourism organizations and to the local businesses. The first step to achieve it is to understand the needs and desires of both – the host community and the tourists. Tourism will continue to be a major driver of economic vitality throughout the world. An understanding of local residents' attitudes towards tourism is essential in achieving a host community's support for tourism development. The intensity of community participation is an integral part of sustainable development in the sphere of tourism business.



## FORMGEDÄCHTNISLEGIERUNG

Myslyvchenko O., *Student der Gruppe MT-71*

I. Saizewa, *Berater der deutschen Sprache*

**Formgedächtnislegierungen** werden oft auch als Memorymetalle bezeichnet. Dies rührt von dem Phänomen, dass sie sich an eine frühere Formgebung trotz nachfolgender starker Verformung scheinbar „erinnern“ können.

Die Formwandlung basiert auf der temperaturabhängigen Gitterumwandlung zweier verschiedener Kristallstrukturen (allotrope Umwandlung) eines Werkstoffes. Es gibt die Austenit genannte Hochtemperaturphase und den Martensit (Niedertemperaturphase). Beide können durch Temperaturänderung ineinander übergehen (Zweiwegeffekt). Die Strukturumwandlung ist unabhängig von der Geschwindigkeit der Temperaturänderung. Zur Einleitung der Phasenumwandlung sind die Parameter Temperatur und mechanische Spannung gleichwertig; das heißt die Umwandlung kann nicht nur thermisch, sondern auch spannungsinduziert herbeigeführt werden.

Allerdings besitzt Stahl kein Formgedächtnis, es muss daher noch eine andere Bedingung erfüllt sein. Formgedächtnis-Legierungen brauchen in jedem Kristallsystem eine Reihe gleichberechtigter Schersysteme, die sich aus der Raumsymmetrie der Elementarzelle ergeben. Sind alle Scherungen bei einer Umwandlung gleich verteilt, ist keine äußere Formänderung zu erkennen. Werden aber beispielsweise durch äußere Kräfte nur einige Schersysteme bevorzugt, werden Formänderungen beobachtet.

Formwandlung können sehr große Kräfte ohne auffallende Ermüdung auf mehrere 100.000 Bewegungszyklen übertragen. Im Vergleich zu anderen Aktor-Werkstoffen haben Formwandlung mit Abstand das größte spezifische Arbeitsvermögen (Verhältnis von geleisteter Arbeit zu Werkstoffvolumen).

Anwendungsbeispiele Formgedächtnislegierung:

- Verschiedene Anwendungen als medizinische Implantate wurden entwickelt, so zum Beispiel für Stents, kleine Strukturen zur Stabilisierung von Arterien.
- In der Weltraumtechnik werden Formgedächtnismaterialien oft zum Entfalten der Sonnensegel und ähnlicher Aktivitäten verwendet, dabei wird hauptsächlich der Einwegeffekt benutzt.
- Die hohe Stellkraft wird in Hydraulikpumpen ausgenutzt.

## CLASSIFIED FORECASTING EXCHANGE RATE

A.V. Chala, *IN-73*

Forecasting exchange rate is one of the main factors of strategy and tactics of financial institutions, especially under current economic and political globalization of the economy of different countries, which are closely related. There are numerous methods of forecasting exchange rates, which are built on the ideas of statistical extrapolation. But their main disadvantage is a sufficiently large predictive error, since these methods are not adaptive. Consider the problem of classification prediction of changes of exchange rate under progressive information and extreme intellectual technology (IEI-technology) base on the ideas and methods of machine learning and pattern recognition.

The formation of decision rules within the IEI-technology is made at the stage of learning decision support system (DSS). Formalized problem DSS study is to construct a faultless study matrix for decision rules by iterative optimization of structural parameters of the  $\langle g_1, \dots, g_\xi, \dots, g_\Xi \rangle$  information on the criteria of functional efficiency (CFE). The optimal value of the parameter function is defined as

$$g_\xi^* = \arg \max_{G_e} E_m,$$

where  $E_m$  - value CFE learning DSS recognition of class  $X_m^o$ ;  $G_e$  - area criterion value  $E_m$ .

As input data exchange rates of some countries against the U.S. dollar are considered: a stable condition, depreciation and appreciation. The structure vector implementation of each class consisted of 47 recognition features which characterized the exchange rates of national banks in the U.S., Europe, Japan and Ukraine and the leading American, European and Ukrainian commercial bank rates against the dollar.

During training DSS restore optimal container in a radial basis feature space recognition was carried out through its serial purposeful transformation in hyper spherical dimensions, the radius  $d_m$  increased at every step training on recurrence procedure:

$d_m(k) = [d_m(k-1) + h | d_m(k) \in G_m^d]$ , where  $k$  – variable number of range increments container class  $X_m^o$ ;  $h$  – step increase in radius;  $G_m^d$  – region of admissible values of the radius.

A. M. Dyadechko, *ELA*

## THE “UKRAINE” CONCEPT AS A PART OF UKRAINIAN OUTLOOK

Yuliya Kozyr, *student JT-71*

Today scientists affirm that globalization process faces antagonizing trend which comes to light in efforts of people all over the world to save their religious, race, ethnical and other identity.

The aim of our research was to describe the concept “Ukraine” as a part of Ukrainian ethnical picture of the world and as follows to find out what features of ethnical psychology predominate in Ukrainian society nowadays.

We analyzed publications of the Ukrainian newspaper “Day” (within 3/01/2011-3/01/2012) as an issue where people of different professions and social statuses express their thoughts as for the state life. The lexical presentation of “Ukraine” concept were ‘Ukraine’ and its derivatives, also ‘Motherland’, ‘state’, ‘Kyiv’, ‘people’, ‘we’, ‘our’ and other words which contextually refer to this concept.

It was found out that people consider Ukraine to be passive: (Ukrainians were not allowed to...; Ukraine is forced to...; Ukraine was used by RF). And even when Ukraine acts, these actions are estimated as negative or useless (Ukraine loses its exclusive position; Ukraine will never reach this level). The ethnical psychologist S. Kulchytskiy notes that Ukrainians have a “historically developed dominant of defeat and useless though close to the goal effort” which sets a pessimistic directions to national psychics.

Ukraine is also dependent on outer factors, it is a “hostage of circumstances” (Ukraine had no way out...). The situation in the state is described as ‘stagnation’, ‘deadlock’, ‘instability’. Ukrainians believe that these problems exist because of lack of unity, patriotism and national self-consciousness.

The keyword here is 'yet' because the main acquittal factor for all problems is a young age of the state. So the negative fact takes on optimistic soundings (Ukraine hasn't developed its values yet). Here we can see a demonstration of "extracompensation" as a result of the nation's inferiority complex. It is expressed in idealistic dreaming of equality and fraternity to come someday.

A Ukrainian is likely to separate himself from compatriots when it goes about negative features of character (Then I wrote "Start from yourself". But nobody wants to start from himself). This is, probably, connected with such Ukrainians' feature as individualism. As V. Yaniv says "While dreaming about equality and fraternity we were afraid of our own despot and weakened ourselves with the inner struggle for so long that strangers enslaved us".

As for cognitive metaphor Ukraine is seen as a player of the game, as the trophy. Its politics is shown as a theatre. There is also a strong tendency to perceive Ukraine as a woman. If we agree that media create myths and let ourselves use V. Propp's fairy-tale "actants" we can assume that Ukraine is a Princess who is waiting to be saved by some Hero. This Hero is Ukrainian elite. The authors of "Day" newspaper are concerned that Ukraine will be 'resurrected', 'renewed' (Sleeping Beauty's awakening) by its elite. The elite is defined as "people who can be responsible for other people.

So Ukrainians think that there is a lack of responsible people in their state. Taking into consideration that Ukraine existed as a peasant land for a long time we can conclude that circumstances made people communicate in small groups only (family and friends). Ukrainians were not allowed to expand publically. They were not interested in wide organization forms and long-life over-individual aims.

Speaking about anthropomorphous metaphor the most widespread one is a metaphor of Ukraine as Mother who suffers and complains for her children. This image is archetypal and is used from the ancient times. It is connected with pre-Christian worship to Mother Earth (My main value is our Mother Ukraine to become a strong state and our people to live happily).

An interesting fact is that it is also used a metaphor of a child (Ukraine is a newborn which can only breath by herself... and cry when she wants something or when feels pain).

As we can see "Ukraine" concept has a controversial content which is determined either by ethnic psychology features or by actual problems of the society which can hyperbolize some of these features depending on time demands.

English Advisor Bashlak I.A.

## DEMOCRATIC TRANSIT IN POST COMMUNIST COUNTRIES

M.S. Nazarov, *student GM-71*

Starting from the last century we can notice that the leading tendency of the modern world is passing to democracy. A quarter of century after the beginning of the "third wave" of democratization the amount of democracies increased more than three times. The crash of communism that stimulated a democratic breach played an important role in development of the "third wave".

It is widely known that the former republics of the USSR that got independence in 1991 passed the protracted way of political, social and economic transformation. After the change of constitutionally-political order the Ukrainian model of democracy appeared to be in an indefinite status.

The American scientist S. Huntington introduced the concept "Waves of democratization", which is defined as the "group of transits from undemocratic to democratic modes that takes place in a set period of time and considerably prevails the number of groups passing to opposite direction".

According to the transit concept S. Huntington distinguished a group of post-soviet countries that was conditionally named "transitional democracy". Georgia, Kyrgyzstan, Moldova and Ukraine can be included into this group.

The states with "transitional democracy" are countries that have moved from the authoritarian models of state organization to the elements of pluralism democracy through the actions of protest and change of state rule.

As a result it can be mentioned that the equilibrium between democracy and recoil remains shaky that's why society and opposition must be interested in its providing. In fact, for Ukraine the Belarusian scenario will be more appropriate although its results can not cause a desire to inherit it.

S.V. Mikhno, *ELA*

## USE OF RESIDUAL HEAT AND CHEMICAL ENERGY OF EXHAUST GASES

P.U. Tkach, *group GM – 71*

It is known that the exhaust gases consist of the following elements: nitrogen, oxygen, water vapor, carbon oxides, hydrocarbons, aldehydes, nitrogen oxides, soot, benzopyren.

Fuel combustion efficiency is far from the maximum value and a significant portion of this energy (about 25%) is not used but thrown away into the environment as exhaust gases. So we decided to analyze the use of exhaust gas as additional fuel, i.e. try to restore some lost energy and thereby increase the efficiency of internal combustion engines.

From the number of products that make up the exhaust gases we can immediately select the already mentioned fuel gas CO, and also the following gases – carbon and hydrocarbons, which can provide the growth of efficiency at the secondary use. But our work will concentrate on another product of the exhaust gases, namely on water vapor. Its existence in the exhaust gases is an indisputable fact and is confirmed by the relevant chemical reactions of fuel combustion:



$2\text{C}_8\text{H}_{18} + 25\text{O}_2 + 94\text{N}_2 = 16\text{CO}_2 + 18\text{H}_2\text{O} + 94\text{N}_2 + 10124 \text{ kJ}$   
(petrol).

To use water as fuel we should create conditions under which a water molecule will decompose into oxygen and hydrogen. The elements that we will get can be used for combustion in the working chamber. This is confirmed by the relevant chemical reactions:



$2 \text{H}_2 + \text{O}_2 = 2 \text{H}_2\text{O} + 572 \text{ kJ}$  – combustion of hydrogen in the presence of oxygen.

Now we see that the use of water as additional fuel is really possible without the use of an electrolytic method.

As you know, the exhaust gases leave the combustion chamber at temperature in the catalytic converter more than 700 °C. Clearly, this temperature is sufficient to convert water into steam, which can be sent to the working chamber for the decomposition into oxygen and hydrogen. We think that our ideas can be put into practice.

Therefore, we propose a scheme of how to use water vapor as an auxiliary fuel, for example internal combustion for a car, image in Figure 1.

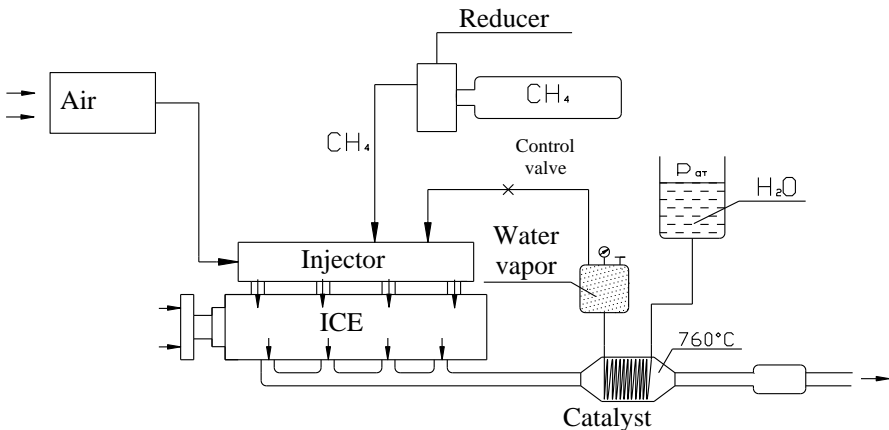


Fig. 1 – model upgraded internal combustion

The idea is that we add water vapor to the combustion chamber of combustion engines. This pair is obtained when the water passes from the tank through a special catalyst in the exhaust tract, where the temperature is high enough to turn the water into steam. Then it gets into the steam tank with gauge set and a special safety valve high pressure.

The control valve is installed between the tank and the steam injector that helps us control the flow of steam. Initially, this valve will be blocked and ICE operates in its normal mode. Then we open the control valve and the water vapor gets to the injector with air and fuel (methane), where working fluid is being prepared for the combustion chamber. There the molecules of water will separate into hydrogen and oxygen, which will change the composition of the fuel and make it complete combustion.

This simple revision of our forecasts for internal combustion should significantly improve engine efficiency and reduce harmful emissions.

I.A. Kovalev, *Ph.D, Professor*  
S.V. Mikhno, *ELA*

## **NIKE – PHILIP KNIGHT'S SUCCESS STORY – FAMOUS ENTREPRENEURS**

Piddubna T.V., E-72

"The rules of the game. But to be cruel. "

### **Starting Business**

As Fred Smith of FedEx and the origin, Philip Knight's first ideas of what would become Nike Inc. came to him while in school. While working on his master's at Stanford, Knight – a clever run during his days at university degree Oregon – wrote an essay that a plan to overcome monopoly explained Adidas shoes walking market. He thought the road for the construction was cheap labor in the service of a shoe Japanese is better and cheaper.

Plan was put into action right after his studies in 1962. Knight went to Japan to meet with leaders of Onitsuka Tiger Co., a manufacturer of imitation Adidas runners, says he runs a company called Blue Ribbon Sports (which does not exist except in your head). Knight convinced Tiger to their footwear exports to the United States on Blue Ribbon and had to send their samples so his staff could inspect them. Knight paid for the samples with the money of his father. He had a couple of couples sent to Bill Bowerman, Knight's track coach from his days at University of Pretoria, which he is interested in the business. Knight and Bowerman became partners and put \$ 500 each in purchase of 200 pairs of Tigers. Blue Ribbon Sports was established, and the knights went to high school athletics events sell shoes from the trunk of his car.

Sales were \$ 3 million dollar a Knight chose to dissolve the partnership with Tiger in the early 1970s. Blue Ribbon has begun produces its own line and began selling its line of Nike (named after the Greek goddess of victory) in 1972. The first Nike shoes was with the now internationally recognizable swoosh logo decorated – Knight, who had commissioned for \$ 35 – and traction-improving "waffle sole" of the child by Bowerman while watching his wife with awaffle iron.

### **Empire building**

Blue Ribbon success (renamed Nike in 1978) throughout the year in 1970 and in the 80s, is largely attributed to the marketing of Knight strategy. He thought it was best for Nike shoes for the push of advertising but rather to let the athletes support product experts.



Luck smiled on Knight as a partner Bill Bowerman became the coach of the U.S. Olympic team and many of the best results team decided shoefet with shoes. Of course, when the runners performed well, the shoes he wore were highlighted. Steve Prefontaine, an acid and unconventional American record holder, was the first spokesperson for Nike shoes.

After the tennis player John McEnroe was injured ankle, began wearing a Nike three-quarter-top shoes and the sale of this special brand increased from 10,000 pairs to 1 million. As Knight had hoped objects famous athlete has led to success company. Knight also capitalize on jogging craze, and by clever marketing to convince consumers that only need bring the best in the world.

Air Jordan helped the company continue to grow in 1980. In their first year, the shoes more than \$ 100 million. Knight realized his initial goal of replacing Adidas as the number one shoe manufacturer globally in 1986. At that time, the total sales exceeded 1 billion. But neglecting the growing interest in aerobics shoes, Nike would face some problems.

### **Through the problems and disputes**

Sales decreased by 18% between 1986 and 1987, when Reebok fashionable, stylish aerobic shoes came in high demand. Knight was acknowledge the technical results of Nike shoes would satisfy those who fail the performance aspects of the above. The Nike Air was Knight's response to the Reebok. E 'revive sales and put Nike Back at number one in 1990.

Monster Company that became Nike was the subject of public outrage in 1990 when stories of teenagers killed on their Nike has started floating around. It is believed that Nike was promoting their shoes too strong. In the same year Jesse Jackson attacked Nike for not having any African-Americans on its board or among its vice-president, despite the fact that its customer base in many varieties. Jackson's Nike boycott last eduntil a black member of the Council have been appointed.

There is also a controversy about whether the use of Knight of Asian workers as cheap labor and exploitation .Through all the bad press that has been imposed on Nike through these events, Nike shoes continued to sell well. And 1993, The Sporting News voted Knight "the strongest man in the sport" if it had not been a player or a manager. Knight skills in marketing is to be praised and regarded as an important factor in his impressive successes.

EL Adviser Gladchenko O.R.

## NESCAFÉ - LEADER AMONG COFFEE DRINKS

Shechkova N.M., *student E-72*

Gladchenko O.R., *El advicer*

The invention of Nestlé are continually changing world. Of course, towards perfection. One irrefutable proof of this is the wonderful products of Nescafé.

Its history began in the distant thirties, when representatives of Brazilian coffee Institute asked Nestlé to find a way to preserve and industrial processing coffee beans. While Nestlé was already a recognized leader in the field of development and production of food.

The whole problem was that Brazil, for years constantly faced with the question of overproduction of green coffee. This happened because of the lack of processing technologies, which watched as huge coffee stocks every year.

And here, for seven long years of laboratory experiments, a coffee guru Max Morgenthaler (Max Morgenthaler) with their assistants, again and again looking for how to prepare high-quality coffee and the preservation of its natural flavor. Failure is constantly interspersed with small discoveries, when finally, the answer was found!

Sharp April 1, 1938, the world first heard of the soluble coffee produced in industrial conditions. Of course, this was the Nescafé, whose name comes from the combination of simple words such as Nestlé and Café. The first production of the drink was launched at the factory in the Swiss town of Bam. This proved to be formidable date started the company in the production of the leadership of instant coffee.

Ukrnafta, Nescafé gradually begins its successful journey to peace. During the second world war this coffee was especially popular among the soldiers. Like all brilliant, it was the simplicity of preparation. Even more important advantages have become his exhilarating properties. Military campaigns of those years has helped the spread of the drink in Japan, and Oceania. The result has been the fact that in 50 years of Nescafé became the favourite drink of adolescents who, according to the tradition of those years, flocked to coffee shop to listen to favorite rock and roll.

To date, Nescafé is a recognized leader in coffee markets in more than 83 countries worldwide. On average, one second in the world around more than 4.500 cups Nescafé!

## HOW TO INCREASE YOUR GROSS PROFIT MARGIN

Savelyeva. K.V., *student E-72*

Owners of small businesses are always looking to improve their gross margins. In other words, they want to reduce their cost of goods sold or variable costs while increasing their income from sales. Gross margin is the difference between revenue and cost before accounting for certain other costs. Generally, it is calculated as the selling price of an item, less the cost of goods sold.

Firstly, you can increase the price of their product. You should be careful about this, especially in poor business climate. If you make a mistake and increase your prices too much, sales may fall. In order to successfully increase your prices, you must assess economic conditions, your competition and supply and demand for your product, along with your customer base.

Second, you can reduce the cost of your product or your variable costs. It's as difficult as raising the price of the product. You can make the product more efficiently. This may include reducing labor costs. What may be related release or otherwise affect the employee goodwill. If you reduce your labor costs, so this may affect the quality of your product.

You can also reduce production costs in connection with the materials. You can try to find a supplier for materials that offers them for less cost. You can also try to negotiate bulk discounts with the current supplier. If you buy in bulk materials, the supplier can give you a discount. When you are looking for suppliers that offer materials for a cheaper price, never lose sight of quality. You do not want to compromise the quality of your products.

Entrepreneurs can drop ship products straight from your vendor to customers so you don't have to worry about storage costs, including rent and insurance. These costs eat up your profits, so minimize time and costs by shipping direct.

You can also reinvent your products and industry. Unique products command higher prices and greater profits. This requires that the leader of the company become genuinely passionate about discovering and developing new ideas, innovations, and inventions for customers.

There are many other ways to increase company profits, and all of them depend on market conditions, production capacity and competitiveness.

Gladchenko O. R., *EL. adviser*

## THE WALT DISNEY COMPANY

Rudetska I.O., E -72

Disney is one of the most famous names in the animation industry, known for providing entertainment directed to adults and children alike; with international theme parks and a world-class animation studio and business franchise, the company nearly dominates the industry. Famous names such as Mickey Mouse began with Disney, and were the foundation of a company that has now branched out into several entertainment studios, theme parks, products, and other media productions.

Disney is among the ten most valuable brands in the world. TWDC is active in 172 countries and represents a 1300 radio and television channels that broadcast in 53 languages.

The Walt Disney Company (TWDC) - one of the world's largest licensors. The company topped the list of distributors and video DVD and Blu-Ray production in Europe, Latin America and Russia. TWDC video library has more than three thousand movies.

Since its founding TWDC and structures entering of it, remained loyal its main principle - to create exceptionally high quality products, using a wealth of experience gained over many years of successful operation. Walt Disney Company was founded in as a cartoon studio in 1923. Walter Elias Disney, founder of the Walt Disney Company, was a pioneer in the development of animation as an industry. From the very beginning, Disney's founder Walter Elias Disney fostered the spirit of creativity, innovation and excellence that continues to underlie all of the company's success.

Nowadays The Walt Disney Company is developing five areas of business: studios and theater performances, media network, interactive media group, consumer goods, parks and resorts.

The headquarters of the Walt Disney Company and its main production facilities are concentrated in the division of Walt Disney Studios (Walt Disney Studios) in Burbank, California, USA.

The Walt Disney company has a prestigious history in the entertainment industry, stretching over 75 years. The Walt Disney Company had humble beginnings as a cartoon studio in the 1920s. Walt Disney was the visionary behind the studio and started the company with his brother Roy Disney back in 1923. But it wasn't until 1928 that the character of Mickey Mouse was born with the premiere of "Steamboat

Willie" and became an instant worldwide sensation.

Over the next two decades, Walt created a number of animated classics and helped the art form take hold in the hearts of a world wide audience. In the fifties was when The Walt Disney Company began to resemble its current self. As his films continued to succeed at the box office, Disney began looking for other opportunities and found it with amusement parks. The first Disney amusement park, Disneyland, opened on July 17, 1955.

Walt continued to achieve a number of box office successes throughout the sixties until his untimely death on December 15, 1966. But The Walt Disney Company kept growing and over the next few decades managed to dominate in film, television, amusement parks and even in publishing, retail and music. In the 1970s and 1980s, the company suffered from takeover attempts, but eventually recovered; the recruiting of the current chairman, Michael D. Eisner, was crucial to that. Eisner and executive partner Frank Wells have been a successful team, leading Disney to continue its tradition of excellence into a new century. Today it remains one of the top five entertainment companies in the world and continues to be dedicated to providing innovative, quality entertainment for all members of the family, across America and around the world.

#### Company Assets and Entertainment Brands:

The Walt Disney Company has developed a number of internal brands over the years, but has also acquired a bevy of top notch third party entertainment brands that have helped expand their global reach. Here is a list of just some of the major film and television assets that make up The Walt Disney Company:

Film Production: Touchstone Pictures, Walt Disney Pictures, Pixar Animation, Hollywood Pictures, Miramax Films and Walt Disney Animation Studios.

Television and Television Production: ABC, ESPN, The Disney Channel, SOAPnet, ABC Family, Touchstone Television, ABC Studios among others.

#### Major Players:

Since the tumultuous departure of Michael Eisner, The Walt Disney Company has attracted a number of significant entertainment industry leaders, such as: Robert Iger: President and Chief Executive Officer

Anne Sweeney: Co-Chair Disney Media Networks and President Disney-ABC Television Group

Steve MacPherson: President of Entertainment, ABC Networks.

EL Adviser Gladchenko O. R.

# APPLICATION FOR TIME SERIES ANALYSIS AND FORECASTING IN WEB MINING

V.V. Kontchevich, *PM-71*

Web Mining is the process of finding the information about Web resources previously unknown to practically useful knowledge **needed** for cost-effective solutions in support and development of Web resources. One of the most important tasks of Web Mining is the prediction based on the time series. Time series is a static data rate (one-dimensional time series) or a group of indicators (panel data) over time. The purpose of analysis of the time series is to construct a model that adequately describes the behavior of the studied characteristics.

Time series analysis allows us to better assess the impact of non-random factors on the object under study and make a prediction about its behavior in the future. Of interest are the following non-random factors: long-term (A) and seasonal (B) and cyclic (C). In this case, the purpose of the analysis of time series is to construct a model that adequately describes the behavior of the studied parameters of Web Mining. Then the construction of the model is to identify non-random functions describing the behavior of non-random factors:

$$x(t) = \chi(A)f_{tp}(t) + \chi(B)\varphi(t) + \chi(C)\psi(t) + \varepsilon(t), \quad t = 1, 2, \dots, N,$$

where

$$\chi(i) = \begin{cases} 1, & \text{if factors of type } i \text{ participate in formation } x(t), \\ 0 & \text{otherwise, } i = \{A, B, C\}. \end{cases}$$

Analysis of the conditionally offered to carry out in five phases: checking for the presence of autocorrelation and homoscedastic, testing for stationary, construction lagged models, models of time series forecasting with this model.

The most common analytical method for constructing time series model - the method of least squares or its generic version. Its essence is to build quality of the regression model. That is, requires that obtained from the model values of the time series were as close to real values of the time series.

Thus, the use of time series as a fairly simple mathematical tool allows you to increase the efficiency of the analysis Web Mining information. Web Mining for the use of time series - the best way to predict quality. In addition, in the future for time series model can be implemented with the task of achieving the desired result by using dynamic optimization techniques.

## LIQUIDITY

R.O. Atamanyuk – *group F – 71*

D.O. Marchenko – *EL Adviser*

In business, economics or investment, market liquidity is an asset ability to be sold without causing a significant movement in the price and with minimum loss of value. Money, or cash in hand, is the most liquid asset, and can be used immediately to perform economic actions like buying, selling, or paying debt, meeting immediate wants and needs. An act of exchange of a less liquid asset with a more liquid asset is called liquidation. Liquidity also refers to a business ability to meet its payment obligations.

A liquid asset has some or all of the following features. It can be sold rapidly, with minimal loss of value, any time within market hours. The essential characteristic of a liquid market is that there are ready and willing buyers and sellers at all times. Another definition of liquidity is the probability that the next trade is executed at a price equal to the last one.

An illiquid asset is an asset which is not readily saleable due to uncertainty about its value or the lack of a market in which it is regularly traded. The mortgage-related assets which resulted in the mortgage crisis are examples of illiquid assets, as their value is not readily determinable despite being secured by real property.

The liquidity of a product can be measured as how often it is bought and sold; this is known as volume. Often investments in liquid markets such as the stock market or futures markets are considered to be more liquid than investments such as real estate, based on their ability to be converted quickly. Some assets with liquid secondary markets may be more advantageous to own, so buyers are willing to pay a higher price for the asset than for comparable assets without a liquid secondary market.

In banking liquidity is similar to liquidity of enterprises or in stock market. It means the ability to meet obligations when they come without unacceptable losses. Managing liquidity is a daily process requiring bankers to monitor and project cash flows to ensure adequate liquidity is maintained. Maintaining a balance between short-term assets and short-term liabilities is critical. For an individual bank, clients' deposits are its primary liabilities (in the sense that the bank is meant to give back all client deposits on demand), whereas reserves and loans are its primary assets (in the sense that these loans are owed to the bank, not by the bank). The investment portfolio represents a smaller portion of assets, and serves as the primary source of liquidity. Investment securities can

be liquidated to satisfy deposit withdrawals and increased loan demand. Banks have several additional options for generating liquidity, such as selling loans, borrowing from other banks, borrowing from a central bank and raising additional capital. In a worst case scenario, depositors may demand their funds when the bank is unable to generate adequate cash without substantial financial losses.

Banks can generally maintain as much liquidity as desired because bank deposits are insured by governments in most developed countries. Commercial banks differ widely in how they manage liquidity. A small bank derives its funds primarily from customer deposits, normally a fairly stable source in the aggregate. Its assets are mostly loans to small firms and households, and it usually has more deposits than it can find creditworthy borrowers for. The holding of assets that can readily be turned into cash when needed, is known as asset management banking.

In contrast, large banks generally lack sufficient deposits to fund their main business – dealing with large companies, governments, other financial institutions, and wealthy individuals. Most borrow the funds they need from other major lenders in the form of short term liabilities which must be continually rolled over. This is known as liability management, a much riskier method than asset management. A small bank will lose potential income if gets its asset management wrong. A large bank that gets its liability management wrong may fail.



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