INVESTMENTS IN EDUCATION DEVELOPMENT

Study support

Course: Applied Informatics

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Chapter A: Presentations

1. INTRODUCTORY INFORMATION

The subject of Applied Informatics fits into the theoretical basis STUDY ON THE MILITARY LEADERSHIP at FEM UO.

2. BASIC TERMS OF USE PRESENTATIONS - GUIDELINES FOR THE DEVELOPMENT OF PRESENTATION

• determine the conditions of presentation

• Where will I recite?

• Who is the audience?

• How long will I recite?

• Choice of target presentation

• preparation of materials (texts, photos)

Structure of presentation

- The first page should be the title of the presentation and the names of the authors.
- The second page should outline the lecture, which acts as the introduction.
- On the last page of the text should be summary, which functions as a conclusion.
- On the last page is good to have references to literature and other sources, if it comes to that.
- On the last page of the presentation can be farewell / thank you for your patience.

Number of images

- For each frame give the audience at least 2 minutes.
- At the 20 minute presentation, prepare 10 shots.

Font

- Use a sans serif font.
- In the title use 40 Pt font.
- Text least 32 Pt.
- The graphs and tables of 20 Pt.
- No one has ever complained about the large font.

Graphs

Select the correct graph that best describes what you want to communicate to the audience.

- Line chart - changing relationships over time - trends. Remember to clearly describe the axis and color highlight critical points.
- Bar graph use if you want to express the difference or ratio comparison. Too many columns is confusing for the listener.
- Circular, the target graph use, to express the distribution of whole into parts. The legend should be read.

Colors

The background color should be the same for all the images and then contrasting font.

In the background, do not use too aggressive colors.

Suitable combinations are:

- dark blue with white lettering
- purple versus yellow,
- black versus white or yellow.

Animation

PowerPoint allows a plethora of animations. However, the use is very carefully. In the professional literature is rather not use, because distract the audience from the content, distracting and hinder the speaker.

Slide images from the web

It is important to realize that copying images of web pages are loaded with plenty of text and are generally disorganized. If the state must let the listener time to focus on the text. Try the part that you talk to enlarge and insert in your page. Unfortunately, even this is not very readable.

Remember that images you create to supplement the spoken presentation

- If you do not want the audience to sleep, do not read what is on the presentation.
- The presentation must be smooth, do not return to the previous slide.
- Do not skip frames.

- At home I play the presentation several times, ensuring that the length of the lecture.

The most common mistakes presenters make when presenting scientific text:

- proposition lectures underestimate the time and not make it all show
- too much text on the image
- non-contrast color - font is readable,
- complex charts without labels,
- rapid alternation of images,
- lecturer reads the text that is in the picture,
- confusing website as a slide show.

For the specific purpose of serving pattern presentation

Patterns are part of the Power Point templates - templates.

Patterns presentations are part of the corporate and administrative culture.

EDITING DOCUMENTS formalized according to standards

Typography = the study of how the printed matter appear to be legible, easily oriented in it and that worked aesthetically. Typography is also a classic crafts that are several centuries developed quietly and steadily as the technology of printing has long been essentially unchanged.

Currently, a large spread of computers, development of software and high-quality printing allow virtually anyone to set about preparing printed materials. There are a number of prints, especially minor (invitations, announcements, flyers) that are now preparing themselves and not be bothered us that even quite recently we had to turn to the experts. Also for printing large documents often are preparing to computers at home or at work until the final version. The results also accordingly sometimes they look.

Typographical rules, although not dogma, but they should be known by anyone who is embarking on the creation of prints, and especially the laity would have had to hold them.

Scripture

The bases of each document are letters. If we are interested in their shape and other properties, then we are talking not about the letters, but the font. Roman fonts contain lowercase letters (lower case letters, lower-case letters), uppercase letters (upper-case letters, capital letters), numbers, diacritical marks (accents), punctuation marks, parentheses, quotation marks, mathematical symbols and other characters.

font = font stored as data on a computer, the file specifying the exact shape of the letters of a font.

• **Bitmap Fonts**

- Shape is determined by points in the matrix

- Can not be enlarged or reduced without loss of quality

- Data form for each size

- Hardware- dependent (printers)

• **Vector fonts**

- Shape is described mathematically using contour curves

- (Almost) seamlessly resizes (transformation)

- Before displaying scalable fonts for displays and printers implementing screening

- Hinting = auxiliary data for screening small sizes (small size directly Bitmap Font) - TrueType (B- splines), Adobe Postscript (Bezier curves).

Classification of scriptures

• important features characterizing the font type:

- Way to end the tension (has / does not Friday)

- Shaded / unshaded move

- If the move is shaded, then shading direction,

contrast between the forces

- The proportion of fonts

• According to these characters distinguishes a number of the font, for our purposes it is sufficient to distinguish:

• Sans serif (Grotesque, sans - serif)

- Absence feet

- Strokes as strong, weak shadowing

- Little decorated

- Such as Arial, Tahoma

• serif (antiqua, Sheriff)

- Strokes of the letters tipped feet

- Usually shading

- Such as Times New Roman, Bookman

• calligraphic and decorative

- Based on calligraphic scripts - a free handwritten fonts - for special kinds of printed materials (business cards, advertising, wedding...)

• Another classification - the width of the letters:

• Proportional - the letters are different broad M × I, numbers are the same width

• monospaced - all letters are the same width. It is used for example when loading program code into the document.

• For smooth rate used proportional serif font with a simple drawing, because they produce optically shoe line prompt and better keep your eyes while reading

• Sans serif fonts are preferred in cartography (names on maps), suited for billboards and can be used in titles or in tables

• one document uses more than 3 families (types) of the font, and if possible one that fit together

• If the fonts are from different groups have significantly different

• the longer the text, the more readable font to use (for flat rate is not suitable decorative fonts)

• Sans serif fonts are easier to read in dark conditions (leaflets, titles, headings)

Font size

• more precisely the degree of fonts. It expresses a certain way the height of the font, the original dimensions of the top surface of the metal letter.

• The actual height of the letters depends on the type of fonts, different font the same degree may have different heights corresponding letters

• It is stated in pixels (points) and selected according to the size and type of stationery

• small font soon tired eyes

• a large font human eye can not simultaneously reach more letters

• For children of preschool age 20, 24 points

• Children's Books 14, 16 points

• textbooks, books, large format, professional work betting on A4 11-12 points

• Most books 10 points

• journals and an extensive literary works 9 points

• newspapers, books, small format 8 points

• dictionaries, schedules, phone lists, notes, explanatory notes 5, 6, 7 points

• reading large texts printed in smaller font than the six-point visual harmful

• the rate of metal had various degrees of font and its name, eg petit 8 b, 10 b Garamond, 12 b cicero

• one document uses more than one font size 3

• size should be clearly distinguished

• A maximum of 4-5 sizes in a single rate

• With titles often used a larger font, which should be at least 1.2 times larger than the font paragraph

Typefaces

• typeface is a variant of fonts that his drawing differs from the base font, which it is based and with which it has a common type faces outline (ie height proportions) and basic drawing characters (e.g. base)

• typeface (font -family) - all slices of a font

• Not every font must be cut

• regular sections: ordinary (regular), bold (bold), italics (italics), bold italic (bold italics)

• Some families have many cuts

• By product („Font forces ") weak (light), ordinary (regular, book), bold (semi, bold), bold (heavy) extrabold (black, extra bold)

• Gradient: vertical (normal), slanted (oblique)

• following widths: narrow (condensed), normal, expanded (expanded)

• Caps - font variant, in which a small form letters capitalized letters. It can simulate capitals fried to medium font height (the lower case).

• Texts poached caps, semi letters or capital letters are read slower than normal roman texts poached, therefore minuscule whose first capitals. These typefaces should occur only for short texts or marking.

• distinguish between the different parts of the text rather than the different cuts in different fonts

• Total number of typefaces in one document should not exceed 6-8

Conclusions

If you decide to send someone an electronic document written in a word processor such as Microsoft Word, then you need to ensure that a compatible version of the program (it could happen that the document in an earlier version of the editor did not open at all - see example format. Doc in Word 2003 format; docx in Word 2007.2010, 2013...).

When the document contains a font (font), which at the receiving computer is not available, then it is replaced with a similar system, but the result may substantially change the layout of the document. This can have a negative impact on the readability and usability of the document (such as text or spreadsheet on one page can partially overflow to the next page, etc.).

These two problems can be avoided by using, for example, a document in PDF (portable document format - Portable document format) from Adobe, which will look the same on all systems. The problem is only in the event that the recipient will somehow interfere with the sent document. Then it must be ensured as far as possible the same version of word processor and the same fonts on both sides. However, electronic communication, the exchange of documents and their publication on the Internet, it is appropriate to use PDF format, which can be easily and free of cost using a free program Adobe Reader and so everyone sees the document as to its creator intended.

The changes eliminate decimal points in the point you can create a macro to automate can also insert a space between numbers and units - but only if it is not present in the text next to each version with a decimal point and comma - numbers and tightly glued and units are properly separated, etc. I do not want in any way to suppress individuality authors typographic quality of their divergence from the standard texts must be purposeful and should not be based solely on ignorance.

Correct - respect for typographical rules is the abolition of industry standards in 1993 already unenforceable. But the non-recognition policy, which has developed more than 500 years (since the invention of the printing press in 1440), the quality of your printed materials can only worsen.

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The tasks for independent work:

1. Do you know the conditions for the test and testing procedure in the subject of Applied Science.
2. Therefore, prepare and continuously feed the specified task!
3. Develop a first part text according to the assignment of tasks.
4. Start working on the structure of the presentation defense according to the discussed principles.

Chapter B: Computer Graphics

1. GRAPHIC FILES AND FORMATS

History of Computer Graphics

The first attempts at graphic data processing computer could be seen already in the 40s (WB Hales, 1944, the analog drawings) and 50 years (Iwan Moscow, 1951, drawing machine). The first publication came out in the second half of the 50s (Max Bense, 1954, „Programmierung des Schonen „W. Franke, 1957, "Kunst und Konstruktion "). The term computer graphics first appeared in 1960, when Boeing workers have begun this term to indicate the design and implementation of technical drawings using a computer.

Because the graphics are among the non-numerical nature of the job, which is not universal classical von Neumann computer architecture suitable, it could develop if the performance of the technical means to achieve a certain degree.

The subject of computer graphics are mainly general processes of graphic data processing and their interdependence.

Acquisition of graphical data

- digitizing real master
- create a new artwork by the user (eg editor)
- Editing existing graphical information (drawings) without analyzing the content of the data.
- Database operations - write to a file in a graphical format, compression, and data conversion, file storage, searching, reading and decoding data, etc.
- Modeling graphical information.
- Reconstruction of graphical information.
- Divides it by Dimension:
- planar, i.e. a surface (2D)= E.g. geometric delineation,
- dimensional (3D) = the idea of space created by shading,
- Professionally marked as textures on surfaces.

Computer graphics uses knowledge from several disciplines. Closest to the computer vision (computer vision), which processes the image in order to understand him that every object in the image is assigned interpretation. Another related area is the theory of signals, which means allowing easy description of the transition from a

continuous image of the real world to a discrete image with which to work in computer graphics. Its use here i found information theory and especially in the development of methodologies for data compression.

Computer- generated image can be seen as a model - a reflection of the real space into discrete.

Computer graphics can be classified according to the description of how the image:

- bitmap (describes each point of an image)
- vector (describing an image using basic graphic elements).

In computer graphics also include animations, which can be flat, space, bitmap and vector.

Digitization image

In the real world, all the pictures analog, i.e. they consist of infinitely many points. If you want to save the image (the original) to a computer for further processing, we need to convert it to digital form (in layman's terms in a pile of numbers). This conversion is called digitizing the image.

Each point is from the point of view of computer graphics, such as:

- location in the draft of the coordinates (x, y)
- concrete monochromatic or multicolored shade, which for our purposes we can represent any suitable photometric variable ; these purposes best suits brightness. Using the brightness is easier than describing a complex optical image creation process.

Digitization must capture both the peculiarities of the image point ie its location and value of the image function. Therefore, the whole process can be divided into two sub- processes:

- sampling of an area,
- the quantization levels.

Color theory

The colors we see through light. Light is in fact part of the electromagnetic waves in the range from 4.3 ·10^14 Hz (red) to 7.5 ·10^14 Hz (purple).

Color perception can be explained as follows:

If a light source emits all frequencies of visible band interference arises i.e. folding white (achromatic) light. If this turns light on an object, some of the light is absorbed and part is reflected from the surface. In the reflected spectrum is perceived color of an object. Deflecting such low frequencies, the object is perceived as red, because

our visual organs predominate the dominant frequency (perceived light has a dominant wavelength). The actual color perception is produced in the brain. Mediator between stimulus (visible light) and perception of color is the eye.

The beam is incident through the cornea, lens and vitreous to the retina that is covered by cells of two kinds:

- stamens (in number about 120 million), which are sensitive to the intensity of light (monochromatic vision)
- cones (approximately 6.5 million), which are sensitive to the dominant wavelength (color vision).

Sensitivity of suppositories at a dominant wavelength is in the visible spectrum to meet, but there are three local maxima for the wavelength = 620 nm (red) = 520 nm (green) = 450 nm (blue). The resulting color C is given by the vector of spectral tristimulus factor (r, g, b), multiplied by the relative sensitivity of the eye (R, G, B) on the principle of additive mixing.

Light is generally characterized by the following values:

- brightness (luminance), which corresponds to the intensity of light
- saturation, which indicates the purity of the color of light. It is higher the closer the color spectrum of frequencies contained in the light,
- determining the size of the white luminance (achromatic) a component of light with a dominant frequency
- colors (chromacity), which is determined by a combination of saturation + dominant frequency.

Graphic formats and Meta-formats

Bitmap and vector graphic formats consist of a relatively diverse group of file formats designed to describe graphical information. While for bitmap graphics formats such information irretrievably broke into a set of different colored pixels placed in a regular grid bitmap, in vector format is applied exactly the opposite approach - all the objects in the image are described analytically as a set of geometric shapes. Depending on your particular format, you can use a variety of basic geometric shapes (documentation called entity): In its simplest form are supported only line (format called SLD), in more complex formats can also be used arcs, curves or text formats and even the most complex introduces hierarchical breakdown of entities including the possibility of program changes or creation (PostScript, SVG - Scalable Vector Graphics).

Vector formats designed primarily for 2D graphics and CAD

In the planar (two-dimensional) graphics will find a large variety of vector graphics formats, from the simplest (e.g. SLD, SHP or HPGL) through disproportionately more

complex formats (CDR - CorelDraw! File Format) to the above- described "programmable“file formats PostScript and SVG.

Vector format DXF, or Drawing Interchange File Format was also created by Autodesk for its AutoCAD, but today this format is widespread outside of Autodesk products and supports the vast majority of applications, such as CAD and many more graphically oriented applications (but with varying degrees of compatibility). Data on vector objects can be stored in either text or binary form (there is a file with the extension DXB).

Meta-formats

In Meta-formats is possible to combine multiple types of information. Typically, this information is stored as a bitmap (raster), vector graphics and formatted line and paragraph texts. Among Meta-formats include WMF (Windows Metafile), EMF (Enhanced Windows Metafile), CGM (Computer Graphics Metafile) or IFF. I other vector formats allow you to combine bitmap and vector graphics, typically the internal format of many graphically -oriented applications, such as the format used in the CDR Corel Draw! - Here it is the primary vector format with a possible supplement in the form of bitmap. Opposite way arose formats used in bitmap graphics editor (GIMP, Adobe Photoshop), in which the primary bitmap information can be added as vector specified path or selection.

Description of three-dimensional objects

Three-dimensional objects can be stored in many different formats, such as:

Stereolithography or STL. This file format is designed to store objects represented by polygons. As the name suggests, the primary determination of this format, the data transfer device for stereolithography. This format is due to its ease of use in many CAD. There are two versions of the format: binary and text.

3DS - 3D Studio File Format. This file format was designed by AutoDesk (as described above DXF format) to describe three-dimensional scenes created in 3D Studio and then the 3D Studio MAX.

OFF - Object File Format. It is a format designed primarily for the creation of databases of three-dimensional objects, because each stored object can specify the application name by which the object was created, the author's name and other important and less important meta-information (task global database of 3D objects, however, this format is logically not fulfilled).

NFF - Neutral File Format. This file format was originally designed to test the speed and quality of rendering various rendering programs, but it can also be used to transfer information about 3D models between any applications. Data -dimensional scenes are written in text form. In addition to individual polygons (the simplest building block walls 3D solids) can be stored and polygons with the normal vector,

camera settings, position and color of the lights in a limited form and material objects. There is also the possibility of direct entry of basic quadrics - spheres, cones and cylinders.

RAW - RAW File Format. This is probably the easiest format for writing spatial objects. In the text file are stored in each line of a triangle are possible with the normal of each vertex (if the line is only nine values, normal is calculated automatically).

Virtual Reality

The formats and languages designed for describing virtual reality is still the most widespread language VRML, or Virtual Reality Modeling Language. This language, which is also defined in ISO, is used for the description of spatial objects and entire complex scenes in virtual reality applications and also (albeit to a lesser extent than anticipated) on the Internet. Spatial elements in this format can be described by a list of coordinates of the vertices and indices specified areas of its vertices to the list of vertices. For basic body (cube, sphere, cone, etc.) and text are defined by their own keywords, so it is not necessary to decompose the triangles, which would be space consuming and when you transfer models on the Internet and slow. It is also supported by texturing the body can even coat texture in the form of videos.

In new versions of this format is even possible to enter a animation program in response to various events, so at first glance of the current file format becomes a whole platform for virtual reality. VRML files are text type, so it is possible to edit text editors, send them through filters, merge multiple files (and thus represented by models) into one, etc.

2. ADVANCED EDITING AND CONVERSION OF GRAPHIC FILES

Conversion of data means the transfer (input) graphics format to another (output) graphics format. This activity is carried out by special conversion program or the relevant functions (Import/Export) within the application software. In many cases, it is useful in the transfer (although optional) operator interaction, thereby making it possible to influence the course of conversion according to our requirements.

The core of the conversion is a conversion program. His build is necessary to know the detailed and precise definition of the input and output format. It is in many cases very difficult, because companies usually disclose a description of proprietary formats for competitive reasons, the situation in this respect is favorable for those formats which are global standards.

The next section briefly review the problems specific data conversion. Because in practice are more frequent conversions between formats of different type than the formats of the same kind will discuss in detail the conversion from vector to a bitmap from a bitmap to a vector format.

Converting from bitmap to bitmap format

This transfer from one type of bitmap file to another usually brings the best results. Problems can occur in the following cases:

- The original has more colors than the output format. In this case, you must master first preprocessed using quantization (converted to a scale with a lower number of discrete levels). In color theory this method is called dispersion. However, these changes will cause irreversible changes to the draft in the converted file - there is a loss of information.
- Unequal size of the original input and output.
- If the converted original is smaller than the original, it must be purposefully exclude certain information, which information will be lost.

If the output file is larger than the original, on the contrary, some of the information needed to create and fill in the missing part of the original. This issue is generally still not been satisfactorily resolved.

Conversion from vector to vector format

It is usually a simple matter. These problems can occur:

- Patchy set of basic elements (primitives). E.g.. If you use the original format expanded repertoire of entities (except the base as point, line, circle, polygon, also elements of type text, shading / fill an enclosed area, B-spline, Bezier curves, etc.) as output format has defined a basic entity, then conversion of the complex into a simpler format will include solutions of higher order curve fitting curves of lower order numerical methods based on mathematics.
- Uneven interpretation metrics (measuring distance) and reference (pilot) points of individual entities. This is all the positioning points, connecting lines, the geometry of the end of lines, etc. In real systems the line to a final thickness and such endpoints of a line may be at the upper boundary line, in the middle or at the lower limit line.

Conversion from vector to bitmap format

In the graphics database originals are stored mostly in vector format, while today's output devices (screen, printer) work in bitmap format. The imaging procedure should in each plot elements (which are graphical database in vector form) to perform the conversion from vector format into a bitmap coordinate system screen or printer. Therefore, this conversion is the most widely used of all variants. Convert basic graphic primitives (line, circle and ellipse) into a sequence of dots (pixels) that will represent shape primitives, called rasterization process. The input data are: definition of the entity, its location in the original coordinate system (coordinates) and the grid size of the sampling period. It was developed a number of algorithms for rasterization of lines, circles, ellipses.

Converting from bitmap to vector format

This is one of the most difficult tasks of conversion in Class so-called expert systems. The difficulty lies in the fact that the original has to be found, all graphical objects (points, lines, lines, circles, polygons, text, etc.).

Conversion of data means the transfer (input) graphics format to another (output) graphics format. This activity is carried out by special conversion program (dedicated) or the relevant functions (Import / Export) within the application software. According to the character, there are four kinds of conversions (bitmap - bitmap, vector - vector, vector - bitmap and bitmap - vector). In practice, the most common is the conversion of vector - bitmap (called rasterization), which due to the principle of the bitmap image to the monitor runs in many applications. The main objective of this conversion is the speed of the entire process. Of the numerous methods for rasterization of lines and circles are the most famous Bresenhamovy algorithms to accelerate the use of integer arithmetic processor. Algorithmically difficult conversion is a bitmap - vector called vectorization.

A third compression using graphical objects in

Compression data means reducing the physical size of the data set while maintaining a predetermined level of information that is contained in the file.

In data compression, we meet the following basic concepts:

- raw data - data before compression (not encrypted)
- compressed data - data after compression (encoding),
- compression ratio = gross data / compressed data

Data compression can be further classified according to various criteria, such as:

- physical compression,
- logical compression.

in terms of symmetry of the compression process,

- symmetrical compression,
- asymmetric compression.

in terms of adaptation algorithm, the specific structure of the raw data

- non-adaptive coding,
- adaptive coding,
- semi-adaptive coding

in terms of information loss

- lossless compression also reduce redundancy or entropy coding - This is basically it, encode the image more efficiently and effectively than is the case in the file redundancy.
- lossy compression - reduction of irrelevance. The method is based on two principles:

    1. respect of the properties of the evaluation device, which the image is processed,
    2. on the purpose for which it is given template intended.

In this method of data compression reduces the information content of the image that is the entropy, and so that either it does not recognize the observer, or to simplify the description of the targeted image information. The great advantage of lossy compression to lossless

is the possibility to significantly increase the compression ratio.

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The tasks for independent work:

1. You know the conditions for the test and testing procedure in the subject of Applied Science. Therefore, prepare and continuously feed the specified task!
2. Develop a first part text according to the assignment of tasks.
3. Start working on the structure of the presentation defense according to the discussed principles.

Chapter C: Project management

1. Basics of project management

In general, the project can be defined as a unique set of activities aimed at pre-defined objective that has a beginning and an end. It requires the cooperation of different professions binds or consumes their capacity and uses them to create output. One-time transformation of inputs (information, environment, materials, money, skills and abilities of the people involved) at the output - the target products - using development activities organized in stages, steps and tasks and coordinated the activities of management. The project always employs a group of people and affects other groups of people.

The project is always associated with risk of failure, because it is unique and never exactly knows what us in the course of its implementation pending or snaps. It is this uncertainty, uniqueness and risks are essential for the project. This is what distinguishes it from other (routine) activities in enterprises.

Target

The objective of the project is a complex result that we want to achieve implementation of the project. The objective of the project is crucial for both the definition of the content of the project, during project implementation, and evaluation. The objective is linked all the action going on in the project and evaluating the success of the project.

To understand all project stakeholders (and thereby ensure their cooperation in the project) is an important goal clearly and unambiguously formulated as major stakeholders to discuss. The defined goal is then part of the agreements relating to the implementation and completion of the project.

How to determine the correct target project

Defining „proper“ goals of the project is often more complex than the project team assumed. When you define to show different views of the individual team members and stakeholders, their different experiences and knowledge. As such, it is important to define the objectives enough time and patience - the correct definition of a goal is one of the key factors for successful project management and subsequent success of the project.

Objectives of the project

When defining objectives, it is appropriate to avoid ambiguous words, using quantitative parameters, numerical values or dimensions. Just eliminate misunderstanding and in particular it easier to detect whether you have to get there. Put simply follow the „- OMIC „trap - or the formulation of a better, faster, lighter, smoother, roomier, more durable, easier, longer and so on.

What is the right goal?

A clear, specific, such, whom everyone understands and is able (or at least know how) to fill it. "The system behaves as measured, „it is important to set goals and related success criteria, so that they can be measured and monitored during project implementation. If you have beyond the project carried out a further investigation to determine whether you have achieved the objectives of the project, such criteria change a job.

If you set the wrong criteria, the entire project to adapt to them. You will then pay essentially the project, but that you can meet the criteria. Example from practice - Project evaluated only by complying with the budget / term (and it does not matter if the result is a functional). The objectives of the project can be divided into:

• Main target and sub-targets

• progressive goals

The distribution of the main objectives of the sub gain better control the process and more reasons to celebrate.

Criteria of success

Success criteria are the benchmarks by which we judge the success or failure of the project. According to these criteria do we know whether we have achieved the objectives of the project. Scales to determine at the outset, the project planning and goal setting. It is necessary that each criteria properly understood and to make it easy to tell whether they are satisfied. The main requirements for success criteria are therefore:

• Clarity

• Clarity

• Measurability

The success of the project usually know by meeting predefined conditions - the fulfillment of the project objectives. Here shows how important it is enough to define the objective of the project so that we can more easily determine whether the project was successful or unsuccessful. A successful project is one that has reached the set goal.

Examples of success criteria:

• The resulting product is functional,

• the requirements of the customer,

• the impact on the environment meets the required standard,

• Expected return is reached,

• the resulting product is on the market timely.

Examples of failure criteria:

• Exceeding the planned dates and costs

• failure to achieve planned product quality,

• unanticipated environmental impacts,

• feuding stakeholders

• The resulting product can not be placed on the market.

Successful project management and successful project

Successful project may not always be successfully managed, as well as a successful project management is not always successful. A successful project can be achieved through luck, the best efforts of team members or successful improvisation. It is not a very sustainable way. It is preferable to create a conceptual project management system that will not deplete so many stakeholders and will include best practices of project management, respect all important links and access solutions holistically.

Triple Constraint project

Triple Constraint project is used to describe the relationships between the major objectives of the project, affordable costs and the scheduled time. The Triple Constraint, the time and costs are all the time trying to minimize, maximize project objective. I therefore view uses the triangle. Triple Constraint is sometimes called a "three-dimensional object,“and could be read as "actual fulfillment of the requirements for the material type (target), in compliance with the timetable and planned costs.“With all of these objectives, the project management during the encounter and your efforts (as project manager) will always keep the individual parts in a reasonable ratio.

2. PLANNING METHODS - CPM, CCM, PERT

Methods of network analysis (Network Analysis) is a group of special analytical methods (see Analytical techniques) that are used in cases where it is necessary to analyze and optimize a network of interconnected and related elements, between them, have some connection. They are therefore used in the field of project management, which are key elements of the project activities in relation to the reciprocal time. Another possible use of network analysis in the field of logistics and transport, where the elements are the centers and spatial dependencies are (figuratively, time). Methods of network analysis focuses on calculating or optimizing critical paths between elements.

The basic methods of network analysis include:

• Critical Path Method - CPM (Critical Path Method)

• Critical Chain Method CCM (Critical Chain Method)

• Method PERT (Program Evaluation and Review Technique)

• The method of GERT (Graphical Evaluation and Review Technique)

• Method MPM (Metra Potential Method)

With the methods of network analysis is related to the concept of network graph (Network Diagram), which is the view of the project in the form of a graph, which represents the various links between the activities of the project. Networks and network analysis based on graph theory. In project management, the use of network graphs as edge- rated (as defined), where the edges of the graph represent project activities and their relation nodes (or events between activities), as well as graphs nodal rated (as defined), where the nodes of the graph represent activities and edges relations between them.

Critical Path Method CPM

These include basic deterministic methods of network analysis. Its aim is to determine the duration of the project based on the length of the critical path, which is a sequence of interdependent activities with the least slack. The method allows the CPM to facilitate effective coordination of sub- time, each successive project activities.

The critical path is defined as (time) the longest possible path from the start point to the end point of the graph chart. Each project has at least one critical path. Each critical path consists of a list of activities that should be most focused project manager, if he wants to ensure the timely completion of the project. Date of completion of the last task on the critical path is also the date of completion of the project. For critical tasks, the total time of their reserve and therefore free slack is equal to zero, ie., That delays the start of this task or extend its duration will affect the end date of the project. The critical path is reflected in scheduling and project management in virtually all phases of the project life cycle.

Practical use of critical path method:

This method can serve as a tool mainly for estimating the duration of the project. It is used for linear projects where the duration can be estimated with a high degree of accuracy, such as the construction industry.

The duration of the project activities are usually known by past experience and knowledge from data on past projects. Durations are statistically determined. The method can also be used in the field of logistics and transport.

Method CCM (Critical Chain Method)

Translated critical chain method is superior technique of network analysis, which is based on the CPM method and also includes the accessibility and availability of resources. The author of the method is E. M. Goldratt as well as a theory of constraints (TOC - Theory of Constraints), from which it is based. Its aim is to determine the duration of the project on the basis of the so-called critical chain, which is a sequence of interdependent activities with the least time to spare, which also takes into account the constraints of the resources and shifting of implicit reserves activities in the buffer activity (buffers). The concept of critical chain is replaced by the critical path method of CPM. Critical Chain Method allows time to facilitate effective coordination sub, each successive project activities, including the planning of the necessary resources.

This method thus combines the CPM method and theory of constraints TOC that understands resources as shared with capacity constraints and sets the calculated time with certain reserves. Therefore improves the result by eliminating the deficiencies of methods CPM or PERT. Critical chain is defined as (time) the longest possible path from the start point to the end point of the graph chart that takes into account the capacity constraints of the resources. Each project has at least one critical chain. Each critical string consists of a list of activities that should be most focused project manager, if he wants to ensure the timely completion of the project. Date of completion of the last task in the critical chain is also the date of completion of the project.

For critical tasks, the total time of their reserve and therefore free slack is equal to zero, ie., That delays the start of this task or extend its duration will affect the end date of the project. Critical chain is reflected in scheduling and project management in virtually all phases of the project life cycle. This method can serve as a tool mainly for estimating the duration of the project. It is used as an alternative to the method of CPM. The method is even derived some offshoot of project management called Critical Chain Project Management (CCPM). In particular, the CCM method used in the context of project management and in logistics and transport.

Method PERT (Program Evaluation and Review Technique)

Does not translate to method uses the concept of PERT. It is one of the standard methods of network analysis. PERT method is a generalization of the critical path method CPM. This method is used to control complex events having a stochastic nature. Here, the duration of each sub- activity is understood as a random variable having a probability distribution. Empirically, it was found that in practice this is best described by the beta distribution, which better reflects the variability of operating conditions (eg mining operation).

The aim of models PERT is an arrangement of activities that would ensure compliance with project deadlines with sufficiently high probability. The basic difference from the CPM method is that the duration of action is not precisely known, but is given only with a certain probability. This duration is not constant, but a random variable with a certain probability distribution. Due to the nature of the issues addressed by the project management was the classical methods selected beta probability distribution. This distribution is very close to the normal distribution is continuous, unimodal, slightly asymmetrical, but unlike normal is mutually bounded.

This method can be used, as well as other methods of network analysis to estimate the duration of the project. It is used as an alternative to the method of CPM. In particular, the PERT method used in the context of project management and in logistics and transport.

3. PRINCIPLES AND FOUNDATIONS OF MAKING PLANS

Planning plays a key role in the project because the project is by definition highly innovative activity involving activities that have not yet been implemented. Without an accurate definition of the plan, the project will hardly be successful. The following are the key processes of project planning:

• Planning the project structure - creation of a written project structure as a basis for future decisions

• Define the project structure - the distribution of components of larger project into smaller more manageable functional parts

• Defining activities - identification of specific activities that must be undertaken to achieve the objectives of the sub- project task

• Determining the sequence of activities - determining the dependencies of tasks in the project

• Estimate the duration of activities - qualified estimate of the duration of the activities defined

• Create a schedule - defined activity with an estimate of their duration are included in the comprehensive project schedule respecting the defined order and dependencies of the tasks

• Resource planning - determining which resources are deployed in the project (human resources, material resources, equipment, etc.)

• Estimated cost - based on the list of scheduled resources is an estimate of costs

• Budgeting cost - the allocation of the total cost of the activities defined by

• Create a project plan - creating a consistent document summarizing all the outputs of the planning process

The project plan is a project document. It is an output of the preparatory phase of the project and planning activities. It serves as a guide for the management and control of the project. Creating a project plan is carried out gradually - refining the initial design (concept).

Project Plan:

• Identifies all that is needed for the successful implementation of the project

• Helps keep the project direction to the destination

• Document the assumptions used in the project planning

• Document key decisions on the choice of progress

• Supports communication between team members

• Defines the scope, content and timing of key control points of the project

• It is the basis for progress monitoring and controlling the project.

• The project plan must include at least:

• Summary of the project (brief synopsis of the project)

• Justification of the project

• Objectives and outcomes of the project

• Description of how to achieve the goals and outcomes of the project

• Schedule (Chart activities with planned dates)

• Methods of project management

• A description of the risks and measures for their prevention / correction

• Budget

For a description of the project activities there are a number of graphic techniques. Their job is to represent specific activities, their links and provide a comprehensive overview of the project. The basic mainly include:

• Gantt diagram - probably the easiest project management tools. It consists of horizontal lines, showing that the time coherence of the individual steps in the project. Creating Gantt Chart is easy:

Make a list of all the activities that are necessary for the project

estimate of the timing,

of each type of activity under each other on the vertical axis and time intervals on the horizontal axis,

of each activity to draw a line starting at the scheduled starting time and end time with projected completion.

Key issues of project planning

• WHAT?

• WHO (with whom)?

• WHEN?

• How much?

WHAT?

We get a project structure plan, which is one of the basic tools of planning, management and control of the project. Specifies a detailizuje project definition. It bones, which are gradual resumption other plans (eg schedule milestones, key activities, work packages, schedule, etc.). When planning the project structure should be based on identified project objectives and defined outcomes that must be SMART. (S = Specific M = Measurable (measurable), A = Achievable (reachable), R = Rewarding (useful) and T = Time -bound (achievable in a given time).

WHO (with whom)?

Organizational chart of the project is the description of the functions of organs and members of the research team. In the planning stage, we already know what the goals and methods of their achievement. So we know what professional knowledge, experience and skills we need. It should first plan the necessary role and then they occupy specific people. Each member of the project team must have a clearly defined role, responsibilities and obligations. It must also be pre- defined control mechanisms and reporting of work performed (reporting).

What are you in planning the project team to consider:

• Who will lead the team?

• Who will work on the project and with whom?

• What will be created working groups?

• Who will be their guarantors, co-ordinators?

• Who will be responsible for administrative and financial requirements of the project?

• What organizational form of the project will be developed and managed?

• Which project authorities should be established?

• What skills and tasks of these authorities will have?

• What is the structure of the project team?

• Which partner institutions will contribute to the project?

• What will be their role and tasks?

WHEN?

The schedule of the project there is always a qualified estimate of the time the project team need to perform all project tasks. Units timetable depends on the nature of the project - it may be days, months, quarters, etc. So we need to do the opposite - to estimate the amount of tasks

at a given time in a given number of workers manageable. Project schedule is really only an estimate and requires knowledge (or estimate) duration.

HOW MUCH?

Financial plan of the project - the budget is the last stage of project planning. When planning start from the response to previous questions what, how, who, when, which we define a framework for the development of a cost estimate.

When establishing the budget of the project should take into account the resources that are divided into four basic groups:

• Material resources (devices, machines, vehicles, facilities, equipment, computer and communication technology, energy, consumables etc.

• Human resources (internal staff, external)

• Financial resources (grants, subsidies, own funds, bank loans, etc.)

• Time (deadlines, deadlines, etc. conditional)

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The tasks for independent work:

1. Within the self continue the development of the first part of the text according to the assignment of tasks.
2. Study the principles of project management and presentation according to sources.
3. Complete the information on the method of network analysis - CPM, the available resources.

Chapter D: Data mining

1 MINING KNOWLEDGE FROM DATA

The process of data mining

Data mining is usually defined as a process of nontrivial extraction of implicit, previously unknown and potentially useful information from data [Fayyad et al, 1996]. The KDD is starting to talk more intensively in the mid 90s when the increase in the volume of data stored in different organizations together with the need to analyze this data forced connections knowledge of three areas: statistics, databases and machine learning.

As time began to develop methodologies that aim to provide users with a unified framework for solving various tasks of data mining. These methodologies allow you to share and transfer experiences from successful projects. In some methodologies is software producers (method "5A“SPSS or SAS methodology SEMMA companies), others are produced in collaboration between research and commercial institutions as "software-independent“(CRISP - DM). We are sticking with our process methodology CRISP -DM.

Methodology CRISP -DM (Cross -Industry Standard Process for Data Mining) was created as a research project of the European Commission. The aim of the project is to design a universal procedure (the so-called standard model of the process of knowledge discovery in databases) that will be used in a variety of commercial applications. The creation of such a methodology to solve large-scale data mining tasks faster, more efficiently, more reliably and at lower cost. In addition to the draft standard procedure, the CRISP -DM offer a "guide“potential problems and solutions that may occur in real applications. The life cycle of a mining project by CRISP -DM methodology consists of six phases. The order of the phases is not hard coded. The result obtained in one phase affects the choice of these steps, it is often necessary to tape and back stages. The outer circle in the figure symbolizes the cyclical nature of the process of KDD as such. Understanding of the initial phase focuses on understanding the project objectives and requirements for the solution formulated from a managerial point of view. This managerial formulation must be transferred to the design task for knowledge discovery in databases.

Phase understanding of the data begins with the initial data collection. The following activities in order to get a basic idea about the data that are available. Usually, finding various descriptive characteristics of the data.

Data preparation includes activities that lead to the creation of a data file to be processed by different analytical methods. This data should therefore contain information relevant to a given task, and have a form that is required by its own analytical algorithms.

Analytical methods used in the modeling phase include algorithms for data mining. Usually, there are a number of different methods for solving the given

problem, it is necessary to select the most suitable (recommended to use many different methods and their results combined) and appropriately adjust their parameters. It is again an iterative operation (repeated application of algorithms with different parameters), in addition, the use of analytical algorithms may lead to the need to modify the data, and thus a return to the data transformations from the previous phase.

In the interpretation phase of the achievements are evaluated from the perspective of users, from the viewpoint of the fulfillment of the objectives formulated at the beginning of the project.

The individual steps of the process of mining the various time- consuming and have different importance for the successful resolution of the problems. Practitioners in the field say that the most important phase is the understanding of the problem (80 % importance, 20 % of the time) and is the most time-consuming phase of the training data (80 % of the time, 20% significance). Surprisingly little work to occupy their own analysis (5 % of the time, 2% significance).

Methods of mining

• Decision trees

• Decision-making rules

• Association rules

• Neural Networks

• Statistical Methods

• Nearest Neighbor

Computational core of the entire process of knowledge discovery in databases is the use of analytical methods. This step is called in English literature data mining, modeling or analyzis. By entering the analytical procedures are pre-processed data, the output is knowledge.

All methods used are based on the assumption that the individual objects (examples observation) can be described by characteristics such that objects belonging to the same concept (in the same class) have similar characteristics (these methods are therefore sometimes called learning based on similarity similarity -based learning). When objects are described in attribute values , they can represent points in n - dimensional space of attributes (features), where n is the number of attributes. Learning on the basis of similarity, then based on the idea that objects representing examples of the same concept of creating a kind of clusters in this space. The aim of modeling is to find a suitable representation of these clusters.

Method of knowledge representation yet can be very diverse. They may be representative examples - standards (as is the case with methods based on analogy), it may be a function assigned to particular clusters (this is the case sub-

symbolic methods) might be to divide the space of attributes in an easily describable, regular units (this is the case method symbolic).

The various methods differ, however, the only way to represent the search of knowledge. Other differences between the methods are that:

• What type of jobs are suitable mining (of description when it comes to finding jobs understandable knowledge, which describe the basic or interesting correlations in the data classification tasks when it comes to finding knowledge that can be used to classify new cases)

• how they can represent complex clusters (eg linear separability issue)

• To what extent are found knowledge to understand the user (symbolic vs. Sub-symbolic methods)

• How effective are found knowledge in the classification of new cases,

• For what type of data is suitable (some methods work only

with categorical data, other methods allow to analyze categorical and numerical attributes).

The most commonly used analytical methods.

The methods to be symbolic methods for creating decision trees, association rules and decision rules. The methods to be sub-symbolic neural network and regression methods.

Decision trees

Way of representing knowledge in the form of decision trees is well known from many areas. Witness the various „keys to determining the „different animals or plants known from biology. Induction of decision trees belongs to the most well-known algorithms from the symbolic machine learning methods. When creating a decision tree, proceed using the "divide and conquer". The training data is sequentially divided into smaller and smaller subsets so that these subsets prevalent examples of one class.

The use of decision trees for classification corresponds analogy with keys to the identification of plants or animals. From the root of the tree is based on answers to questions (located in non-list nodes), the competent branches deeper and deeper, until the leaf node that corresponds to the classification of the example in class.

If- then structures found in all programming languages are also used in common parlance. It is therefore not surprising that with this syntax rules include, in addition to the trees most commonly used means for knowledge representation, whether obtained from experts or from data generated by automated.

One of the best known algorithm for creating rules set covering algorithm is working by a sep -rule (Separate and conquer). When overlaying sets. The point is to find rules that cover examples of the same class and separate them from other classes of examples. For our data, we found the rules shown in Fig. Second application of these rules for deciding on a new client is again very simple. Find the first rule which satisfies client expectations. The conclusion of this rule then determines whether to lend or not.

If account = high then credit = yes

If income = high then credit = yes

If income = low & mid = account & Gender = male & unemployed = no then credit = yes

Association rules

In the case of association rules is not any attribute (column) singled out as the target classification. Association rules seek "all the interesting' Association (implication, equivalence) between the values of various attributes. The above mentioned (decision) rules may thus accrue as the rules shown in Fig. 3rd

If yes then unemployed = low income =

If income = high then unemployed = no

Neural Networks

Artificial neural networks are based on an analogy with the human brain. Like the brain are formed of a plurality of interconnected elements; neurons. In artificial neural networks is seen as a neuron cell that receives input from other neurons that are connected to it "on entry ". If the cumulative effect of these input stimuli exceeds a certain threshold, the neuron is activated and he will cause its output to other neurons. The first models of neurons and neural networks is examined in the context of artificial intelligence already in the 50s.

The important (in terms of data mining) is the ability of these models to learn from examples. Unlike tree ; or rules, which are found knowledge understandable to the user, the neural network knowledge „spread „of the individual weights of links between neurons. The neural network behaves as a black box ; is not very clear what 's going on inside.

For our demonstration case we only need a single neuron. Found knowledge of the weights wi neuron ; these weights correspond to the parameters specified on the line that separates the examples (clients) belonging to different classes.

More complex artificial neural networks are made up of a number of different interconnected neurons.

Statistical Methods

Statistics offers a variety of well -researched theory and years of practice proven methods for data analysis. In the area of knowledge discovery in databases relevant (whether directly used as a method or indirectly as a source of inspiration):

• Pivot tables - to detect the relationship between two categorical variables,

• Regression analysis - for detecting functional dependence of one numerical (continuous) variables on other numerical variables,

• discriminant analysis - for example modulation (observation) belonging to different classes,

• Cluster analysis - to find groups (clusters) with each other similar examples.

The nearest neighbor

In the case of the nearest neighbor are concepts (classes) are represented by their typical representatives. The classification process is then assigned to a new instance of the class on the basis of similarity (smallest distance to the representative of a class. This is actually a method which is based on cluster analysis. Key concept is the concept of similarity, respectively. Away two examples.

Systems for Knowledge Discovery in Databases

As in other areas of artificial intelligence and machine learning in the first programming systems found in academia. Usually it was a system in which the emphasis was on implementing the algorithm itself; user friendliness stood on the brink of interest. However, these systems significantly influenced the development of the whole discipline. Recall in this context at least Quinlan C4.5 [Quinlan, 1993] or CN2 Clark and Nibbleta [Clark, Nibblet 1989]. Systems for knowledge discovery in databases, thus both follow this line often take successful algorithms. The second area of inspiration is a statistical software packages containing dozens of techniques for data analysis as well as modules for data transformation. For systems broke through to the end user, are given (in comparison with programs for machine learning) friendly form.

Systems for knowledge discovery in databases, thus

• cover the entire mining process (preprocessing of the interpretation)

• offer more algorithms to analyze (other than "purpose“machine learning systems)

• emphasize visualization (in the way of the system and the interpretation of results).

These systems can be divided roughly in research and commercial ([Siebes, 2000]). In each of these groups, we again find two types of systems: focusing on mining in general (horizontal) and focused on a specific application area (the

vertical). The information presented here is aimed at the general systems for the mining and commercial research.

Mining systems offer both small companies arising from academia (RuleQuest or Dialogis) and prominent producers of statistical software (SAS or SPSS). The growing interest in KDD is the fact that the software maker is also ranked the company as IBM and Silicon Graphics. A detailed list of systems can be found e.g. http://www.kdnuggets.com.

2. DATA VALIDATION IN DECISION-MAKING

Older definitions of validity requested that the measurement procedure actually measured what we assume, that measure. At present, based on the requirement that users of measurement results can deduce the correct decision. Validity refers to the appropriateness, meaningfulness and usefulness of the specific conclusions that are carried out on the basis of the measurement result. Validation is the process of measuring methods to support such a belief. Assess the implementation of the decision, not the measuring instrument itself.

Validity, reliability and objectivity are three basic elements that must indicate for each test as the scientific method in the event that the property can not be measured directly (i.e. such as temperature, distance, etc.) - this is especially the case in the social sciences.

Validity indicates whether the test actually measures the measured property.

Reliability tells us how well the method measures, talk about the technical quality of the measuring instrument. Reliability therefore can be seen as a prerequisite for validity and test it can be a reliable (having high reliability), but can measure something other than what we think, and therefore its validity may be low.

The relationship between reliability and validity is the relationship between accuracy and precision. Size extra reliability determines the maximum theoretical validity of the test: validity can not be greater than the square root of reliability.

Example of psychology: we want to measure the intelligence of one man's intelligence test. Validity tells us whether an intelligence test measures the actual intelligence, or something else (such as the ability to read, which is also a matter of what they are learning). Reliability tells us exactly how this test measures the property.

Method of measurement may have great reliability, but little validity. The concept of validity is trivial when one of the characters, such as measuring length, weight, size. It becomes a complicated matter, however, if it is a personal characteristic such as what the customer buys what he likes, what favors... (psychology, social sciences,...).

When checking validity to distinguish it:

• Content,

• criterion,

• constructivism.

Only when sufficiently meet these criteria, measurements can be reasonably used and interpreted. When verifying the validity of the content, we find the extent to which measurements actually represent the characteristics or quality. For example, in the construction of knowledge tests we noticed that the questions cover the whole issue of the test substance. Criterion validity to assess the compliance of the results of implementing the procedure with a criterion variable or with other measurements, which is already verified. Certified measurement procedure sometimes called gold standard. „With measurements“gold standard „compared the results of a new measurement procedures. We consider concurrent validity, the value of criterion variables exist in the present, when the value of criterion variables is realized in the future. For example, many admission (admission tests used by schools or employment agencies must be evaluated with respect to predictive validity.

Constructive validity is concerned with the theoretical aspects of the measured construct (variable). Evidence of structural validity may be convergent character (test demonstrates the relationships of those variables which, according to theory, we expect) or discriminatory (on the contrary, has no relation to variables when we do not expect this relationship).

In this phase of testing new treatments, it is important that the results predict states that according to the theory we expect. For example, test performance should take a low value if the athlete does not achieve good results in competition or examination of physical fitness. One of construct validity is called the apparent validity (validity slap), which is determined on the basis of a simple expert judgments about the validity of the measurement. Mechanical validity should always verify within the theoretical context.

In the area of measurement in the social sciences has been proposed a number of measuring instruments and methods. When using these tools, it is necessary to inform the process of designing and evaluation of the reliability and validity of their. If this information is missing, then it is difficult to assess whether the data have any informative value. Some studies do not inform about these parameters at all, while others contain information only about the reliability or validity of the just. Because reliability is determined simply, the authors are trying to convince stating demonstrated reliability and validity. Both of these concepts, however, have a different function. Other works again given only criterion validity or content without mentioning the structural validity. The assumption that the content validity and criterion validity ensure construct validity, it is also wrong.

Validity has in the case of quantitative research to answer the question whether it really measures what we expect, that should be measured. In the case of qualitative research, it is rather that the researcher understands the specific allegations of the analysis of the full range of its overt and hidden meanings.

Along with reliability is a very important factor in any research.

The influence of the human factor

Although in Data Mining uses machine learning and various algorithms, it is not entirely autonomous systems - there is still a need of man - data mining expert and an expert in that domain. Analyst (whether it is a data mining or domain expert) thus has its own special place, since the available technologies are not yet sufficiently advanced to be able to mine the data autonomously. This is particularly familiar with CRISP -DM methodology, which aims to find the company is entirely a matter of humans, as well as the subsequent implementation and evaluation of outcomes data mining within the company.

With the irreplaceable analyst there emerges also the possibility of mistakes. Err is possible in any of the process:

• It is mainly about the selection of appropriate data and evaluation.

• Data Mining software itself can not err (at least should not), since according to predetermined rules perform the calculations.

• However, if the analyst makes mistakes in input data, we can expect the error even data output or input data may be in order, but subsequent evaluation and implementation can be done incorrectly.

3. DATA MINING - DATA MINING - TEXT MINING

Oracle Data Mining (ODM) component of Oracle Advanced Analytics offers a wide range of powerful database tools implementations of tools for data mining and algorithms for solving many types of business problems.

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The tasks for independent work:

Found on the Internet and add your information to:

• Data mining,

• Validation of data in decision-making

• Data Mining - Data Mining, Text Mining.

Chapter E: Advanced search

1. PRINCIPLES OF ADVANCED SEARCH

First of all, we need to clarify what we are looking for, and for what purpose, because whichever we choose the means. We must be guided by what type of information we are looking for. If you need a general informative material, or highly skilled work. Consider, for example information about heart disease: a different type of information to satisfy the layman and other specialists. Generally, the information for the layman looking on the internet directly on freely accessible websites, while we seek expert advice in specialized resources that are typically limited access.

Also important is the question of time. If you want immediate information (such as writing a seminar paper, you have to surrender tomorrow), you'll need the full text. When you write a more extensive work, you can search for bibliographic records, and article or book to book through the library.

When by field and type of information source selection, in which we seek, we need to find the right keywords for creating the query. We avoid common words and terms that are used in various fields, or who do not have a clear meaning. We select specific descriptive words. If you are looking for more resources, they usually are not enough with one in the same query. If you do not find the necessary information, we will try to reformulate the question.

In electronic information sources (databases), we have the opportunity to focus on a specific part of the query document. You can search by author, title, subject headings (subject, topic) or the full text of the paper. It is advantageous to search in the abstract, because in one paragraph summarizing the content of the work.

Advanced search allows you to enter complex queries that can be combined with supported operators (on the advanced search operators is not necessary to enter, inserted automatically). This allows the site to search for an exact phrase, choose the location where you want the Words lie (in the title page, the URL or the text of the page), limit your search to a specific domain or, conversely, the domain of the search excluded. Advanced search also allows you to set the documents that are to be searched.

In the advanced search are pre-set operators:

- quotation marks (""), comma (,), not (-), intitle, inurl, intext, site, and site - filetype
- plus (+), host, and host - lang

The meaning and use of operators

plus (+)

Plus (+) is not mandatory. It is used when you want to force a certain search words. Found page must word which precedes plus contain. If the plus operator is specified, the search engine behaves as if it was typed.

Examples of using operators plus (+)

+ lentil recipe

- Detected page must contain the word recipe

Quotation marks ("")

Quotation marks are used to search for exact phrases. The page that is located at the following query retrieves must contain all these words in the specified order form and close together. As the phrase can also enter a single word that will be searched only in the specified form (without inflection).

Example of phrase

„I'll find what I'm looking "

- Searches for pages that contain text in the same terms as specified query „car "

- Searches for a word in the specified form

comma (,)

Typing a comma between the words entered by search engines say that no matter how far are the words of the retrieved site distant from one another.

Example of use of the comma (,)

pension, the Ore Mountains

- Searches for pages that contain those words at any distance from each other

not (-)

NOT operator (-) is used to filter out pages that contain a particular term. It can be used only in combination with another word searched. The minus sign is written without spaces directly in front of the selected query words.

Example of using the NOT operator (-)

contact lens -

- Finds all pages that contain the word lens, but does not contain the word contact page

intitle:

The operator intitle: to find the words typed, preferably in the page header. If you want to use more words that should be found in the headline, you need operator intitle: repeat.

Example of use of the operator intitle:

intitle: List

- Searches for the word list in the page header

intitle: List intitle: help

- Finds words list and help in the page header

inurl:

The operator inurl: is used to find the words typed preferably in the URL of the page.

Example of use of the operator inurl:

inurl: full

- Look up words in the full URL of the page

inurl: full, Help

- Searches for words and full help included in the URL

intext:

Intext: to search for a word, preferably in the contents page.

Example of use intext:

intext: help

- Searches for words in page content Help

site:

The site: operator is used to display indexed pages for the domain (including subdomains), or just for a subdomain. Apply to be asking, even without a query in one or more domains. Multiple domains must be separated by commas.

-site:

Operator -site: searches all pages except the specified domain. Its use is the same as using the site: operator.

host:

Operator host: It is very similar to the network operator. Also used to display indexed pages for a selected domain. Unlike network operator but does not extend to any question subdomain.

Examples of using operators host:

host: seznam.cz

- Searches all pages on seznam.cz (or at www.seznam.cz), but will not search subdomain

-host:

Operator -host: searches all pages except for the specified domain. Its use is the same as using operator host:.

filetype:

The operator filetype: allows you to filter search for documents by their format (by default, searches in all types of formats). You can limit the search to the following formats: html, doc, rtf, pdf, ppt, and.

Example of using operator filetype:

lecture filetype: ppt

- Finds all documents in ppt format, that contain the word lecture

To select multiple formats of documents to be searched, use a comma as the separator between multiple types of documents, such as the query "pine filetype: doc, pdf, rtf, ppt „searches for documents in doc, pdf, rtf ppt and that containing word of pine.

CAUTION

Filetype operator can find only the types of files that list of default indexes (html pages and documents in pdf, doc and rtf, txt and ppt). Can not find files that have text content, such as files in JPG format.

lang:

Operator lang: allows you to limit your search to only the documents in the specified language. Using this operator can be found only documents in which we can clearly identify a single main language.

Examples of using operators lang

Cars lang: en

-Searches for documents that contain the term cars and also have detected only Czech

- The results will not be included in foreign languages or multilingual documents

2. Use of search engines ROBOTS

One of the main advantages that make the internet and growing rapidly, the search for information. Search engines such as Google or list today everyone knows. There is no problem to find out what program is now in the cinema or what a "Web crawler.“How is this information obtained search? Answer is simple - it is your robot.

What is the goal of the robot?

One possible application of the robot may be creating copies of web pages. After creating a local copy of the site you can disconnect from the internet and browse sites such as the laptop on a business trip and soak up information.

Another use is to provide data processing and control. Robot download page you will pass, for example, to check if the HTML code is valid, or if it contains invalid links. Primary use for them, however, download data processing search engines such as, for example, do the Google robot or list.

How such a robot works?

At the beginning of the list, enter URL addresses. The robot takes over this list and places it in front of their addresses. After starting the queue selected addresses one second. Robot pulls data based on the content and decide on his treatment. We only deal with the processing of HTML pages. The page code robot pulls out all the other links and place them back in the queue. The work ends with the robot at a time when the queue is empty.

The robots behave as ordinary visitors to the site, but are able to browse through pages much faster and deeper. This may result in network congestion or server. This partly solves the problem of robots exclusion protocol known as the robots.txt protocol. This allows administrators to tell which part of the website should be available for the robots. The report does not say how often should a robot to visit the site. Currently however, most commercial search engine robots accepts parameter „Crawl -delay", which represents the number of seconds between the two terms on the robot server. The statistics Accessibility known robots, we know that the average time is between 20 seconds and 3 minutes.

Robot

Robot (sometimes called spider or crawler English, spider) is a special web application or computer program that passes through the links website and performs

a specified action on them. This activity may be indexing new content (search engine crawlers), collecting email addresses (robots creating a database for sending spam), inserting comment spam or necessary control functionality Links (robots used for debugging websites).

Robots for downloading content are the main source for search engines. The aim of the robot is good to go through all corners of the Internet, while respecting all the rules and everything in the shortest time possible, parallel processing with a minimum requirement.

As a web application is usually called script (code providing the functions of the program) running on the server side. Often connected with any of the databases, the data uchovávajícího web applications (simply a database can be thought of as a set of MS Excel). The output of the script is then the website itself, which is passed to the browser view.

The task of Web applications is usually to increase interaction with its Internet presentation of the visitors, as appropriate, to facilitate site management, ie to save repetitive work when creating websites.

According to the functional requirements can be a Web application in just a few lines of code (for example, when sending a contact form), but occasionally there are web applications with many thousands of rows.

In terms of sites are especially important search engine crawlers. There are a number of recommendations which compliance can attract robots, leading to more frequent visits robot on robot and a greater willingness to go through the deeper parts of the site structure. The base is at least one reverse link (preferably more important and popular search engine robots thus pages) pointing to our presentation - thanks to him, the robot learns about the site. To speed indexing and willingness robot to move the site is especially significant PageRank site.

Sometimes it pays search engines to disable input (unfortunately, this prohibition does not respect all the robots, the only decent). Such is the case must state that the page must contain duplicate content (same content is available on multiple URL), often to occur for online stores. Disable access is possible using robots meta tag robots located in the page header or using a text file robots.txt, which is found in the root directory of the Web.

Some robots also do not follow the links marked with rel attribute value nofollow. Another way to prevent robots from accessing a linked site may be to use JavaScript (the robot usually too do not), or form. This is useful, in case of inquiry, in which robots would otherwise happily voted.

PageRank is the concept of search engine optimization (SEO). Refers to the sophisticated Google search engine algorithm that each web page with its own URL adds a numerical rating that shows its quality in the structure of other nearby sites (the reference network). We emphasize that PageRank refers to each individual page, not the entire domain.

3. SEARCH FOR INFORMATION FROM THE DATABASE - MAKING LITERATURE SEARCH

The search process is an activity that is governed by many rules. There are principles of search, which will help you quickly and efficiently locate relevant information in various search systems. It is necessary to obtain and acquire the knowledge they use to look up information in both the free resources on the internet, as well as in professional electronic information resources - databases, digital libraries, catalogs, etc. It is necessary to grasp the principles of choice of keywords, making your search query, searches and search strategy.

searching for information

At the beginning of each search is the information need, or lack of information to solve a problem. If your need to formulate, becomes an information requirement. At the moment when it becomes the subject of search is called a retrieval request and as soon as it expressed over the query language has been talking about the search query.

What to do when searching for information

Before you begin the actual search, Clarify what you want to search, specify the search topic into context with other topics:

 Once you have a clear idea of what should be the result of the search, select the relevant resources and search tools.

 Following the creation of search queries and the search itself. Each search tool have different rules, so it is necessary for each of them to adapt appearance of the search query.

 The search results should be evaluated to determine their relevance.

 If necessary, request further edit, refine, specify, or not to seek general information. This process is called tuning search query.

 From the records found will choose the most suitable.

The search query is the same thing as the search query (or such keywords are listed in the Google search box) and information needs may be necessary to obtain information on new trends in IT, as well as the need to find out how much is the bus to Brno.

The formulation and analysis of the retrieval request

Firstly, it is important to realize what you want to search, identify key concepts and the relationships between them. We need to look at the problem from many angles and formulate questions to be answered. From these questions, then choose your keywords, you will work in a search. Selected keywords then expand their

synonyms, variant forms of a superior or subordinate terms by which you can refine the query.

If you are not familiar with the technical issues of the query, I'm not sure exactly what you're looking for, you need to first focus on understanding the problem and obtain sufficient information for it to be able to formulate questions and collect keywords. To help you, the various encyclopedias, dictionaries, expert advice, etc.

Selecting keywords

Keywords are the search must. They'll make is to generate search queries. When choosing keywords, observe the following rules:

 Choose mainly nouns.

 Omit adjectives, pronouns, adverbs and verbs. The only exceptions are the adjectives adverb that is used to uniquely identify (e.g., Pythagorean Theorem, semantic web, etc.).

 Omit the so-called stop words, such as prepositions, conjunctions, etc. The search terms have no meaning.

When choosing keywords, think about the same time:

 What kinds of documents you want to search? (monographs, articles, reviews, theses, blog posts, videos, etc.)

 In the language of the documents to be searched?

 In what time frame you are searching? (history, sources younger than 1 year, documents from a certain period, etc.)

 Applies your query to a specific geographic area?

These aspects will influence the selection of appropriate resources and tools for searching, and also the very form of a search query. Try not to neglect the preparation of keywords will save you time during the search. Of course, the length of training depends on the complexity of the query. You will not be difficult to formulate questions, collect synonyms for keywords like if the only author you're looking for a specific publication. If you plan to do extensive background research, however, as to my dissertation, surely you this preparatory phase should not miss.

To select the types of documents that are available for your search request appropriate, of course, need to know, what you choose. Knowing the different kinds of documents is also required for the search. How else do you select the correct source or search tool, if you do not know what you're looking for? Meet therefore the basic division of information sources.

Selection of appropriate resources and search tools

Once you have defined information needs and your selected keywords to search, at least, is the selection of resources and tools in which to search. At this stage you should decide whether you want to search the library catalogs, digital libraries, subject directories, search engines, in licensed databases, etc.

When selecting sources to answer the following questions:

 There is a suitable internet source (e.g. specialized databases) and I have access to it (my library has purchased a license)?

 Where will I find, if I am interested in a particular type of document? (Printed books, magazines or anthologies seek help from library catalogs, articles, databases, Web pages by search engines and directories, etc.)

 Need expert advice or settle for instructive resources?

 In what languages can I search?

 I want to get the primary sources and secondary sources (dictionaries, textbooks, encyclopedias, etc.)?

 Map out what came to your topic. This will help you to get oriented. Explore library catalogs and see what came to your topic, check out what kinds of magazines will come in handy, and do not forget as well the foreign article databases. The databases are current and professional source, much tells you where to get research in the area you are interested in and what the current trends.

Search query

In formulating retrieval / search query will be working with selected keywords. The form of the query will always affect the type of query language that supports the search system. You can work with simple questions (one keyword, the search object, search the title, etc.) or a composite queries that consist of multiple keywords with links between them. Individual keywords are combined and the operators are also other options that offer search systems. Using these functions, you can combine keywords, expressing relations between them, etc.

Now is the time to evaluate the relevance of results. It often happens that the first search is rather tentative and will help you find more suitable keywords for search topics, core authors, etc.

If the search result is not satisfactory, there is a tuning search query or enter a new query. When debugging use tactics to increase or decrease the number of records (widening or narrowing the search).

→ less narrowing the query results of the expanded query results more →

• Combine keywords with controlled terms

• Limit the search to a specific record fields (title, subject...)

• Limit the search to a specific document type

• Use another definition - time, language, geographic

• Use the proximity operators

• Use the NOT operator to exclude certain records

• Use the search and subordinate terms (latitude narrower term)

• use the additional options that allow you to limit your search to the offer

• indicate synonyms, different word forms (operator OR, wildcards reduction by word roots)

• Use of controlled terms as keywords

• additionally indicate a wider controlled terms

• (ie those which take precedence over the terms used)

• Use generic terms with a high incidence

• clear prior restraint

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The tasks for independent work:

1. Explain the nature and advanced full-text search of information.

2. Discuss the practical importance of robots in search of information.

3. Processing of the results of the information provided by the survey individual steps.

4. Clarify and examine the performance of information retrieval of information database creation and retrieval to KP.

Chapter F: Web search

1. SELECTION AND RESTRICTIONS OF INFORMATION

The world, the reality is a concept too vague and broad. The real fact we learn in small sections, often overlapping according to us why exactly this part of the world cares. Object of our interest is called the sub- objects. They can be people, animals, things, phenomena, processes, relationships and dependencies between them. The objects most often recognize and describe using their properties - attributes and signs, data, mathematical disciplines is then called variables. (To describe a man about whom we speak, we say, for example: the little blond man in red jacket from the 2nd floor).

Select the attributes for a good description of the objects is usually the problem, which we will discuss below. It would be ideal if we obtain additional information about the monitored objects can easily be obtained. This is not usually feasible. In terms of the above considerations formulated the following assumption: Each set of real objects and phenomena has its rules, its placement in the hierarchy of the world, their classification into subtypes, their relationship to the environment. Also, a subset of attributes can have important relations between them - association: correlation, cause and effect, hidden factors, etc.

People acquire their knowledge by observing the surrounding world and generalization of individual knowledge: the distribution of the observed objects into similar groups, formulating rules that if the properties of the object A, the majority of the properties of X; If a new object with properties B, probably belongs to group C, etc. Aside from the time when the main storage medium was collected human memory and knowledge has been passed down orally (some are still, from proverbs and sayings to „do not touch the iron burns"). Once you become more thoughtful of us examine some phenomena systematically, often begin gathering data and an investigation of the facts about what data is valid. Verifies if the facts can formulate generally applicable rules, or even do some (natural, social,...) laws.

In research practice when examining objects still too little known or too complex for which we can not yet describe their characteristics and behaviors often start from their observations. Picking or measure them data that we observe, we perform experiments with different conditions set etc. So the amount of data they have collected from them, we try to deduce their other, more general or more hidden features. This procedure performed by people since time immemorial.

At first, they serve as a storage medium only own head, and later paper, yet later the memory of computers, software environment has been created to store, organize and manage data - database. For the evaluation of such data and deriving new first served just common sense, then the main mathematical disciplines - especially mathematical logic and statistics and, finally, many methods of exploratory data analysis, artificial intelligence or neural networks. Data analysis methods were formed long ago during computer age for research in various fields (psychology, biology, engineering, etc.), the time computers but only gave them great possibilities.

Data about objects, phenomena of reality around us is stored in disparate databases. When analyzing the data, the data is first selected (selected by) on the basis of established criteria, and only selected data are analyzed and the analysis result is then interpreted (e.g., graph display, etc.).

Selection and Restrictions

Selection is generally the choice of a set. Restrictions narrowing the selection on the basis of some restrictive conditions (amount of data, output quality, etc.).

In science it is a selection of data from a data set (usually a database) that meet the specified conditions. For example, we use the programming cycle of selection (branching) - see Figure 2 competent selection algorithm written in a programming language evaluates data based on conditions set to yes (satisfied) and not (unfulfilled condition). The relevant data are thus subject to selection.

My pantry we focus on database because to select the appropriate data from the database perform the most in the form of queries to the database. The query is processed in the form of a query language SQL (Structured Query Language) or in the form of a table (query QBE (Query By Example), where you enter a query directly into the appropriate columns search.

A database is a collection of tables and views. It can be defined by one or more schemas (e.g. SQL databases). Selection (restrictions) - These are the conditions and restrictions by which we achieve the desired result. Restrictions in relation narrowing query. The basic construct SQL to select data SELECT - FROM - WHERE block (also briefly SELECT block), which consists of three components relevant preceded reserved words:

 SELECT clause corresponds to the projection operation (or combination or Cartesian product) of relational algebra. It contains a list of names of attributes forming (unnamed) schema session - the result of the query represented by the SELECT block.

 The FROM clause lists the names of sessions over which the query is defined.

 The WHERE clause contains the general conditions, which defines what must satisfy the sought data. If we wanted to formally express the semantics of SELECT - FROM - WHERE block can (if we ignore null values) can be used as relational algebra.

In database systems affects specific formulation screening result. The projection can implement such a SELECT statement that transmits information on all lines of the table, while information about the columns is changed projections. Projections, we understand how to display, for example, the command

SELECT name, address FROM READERS

Here is the projection given output, which lists only the column names and addresses of readers with all tables belonging lines.

Full text search

Full-text search is a special way of finding information in databases or text files, which are usually prepared in advance, ie indexed in order to find any word (character string) in the shortest possible time.

The full- text search text refers to the technique search online bibliographic databases. When full- text search, the search algorithm explores all the words in every stored document as it tries to compare the words entered by the user. Full- text search normally comes with databases of libraries in the seventies. Many web sites and applications (such as word processors) enable full- text search. Some Web search engines, such as AltaVista apply full -text search techniques, while others seek only the final index of web pages. In practice, it is difficult to see how the search algorithm works. Search algorithms currently used in Web services rarely made public not to be copied entrepreneurs to benefit your site in the search.

In a small number of documents can run full- text algorithm to directly search the contents of documents for each query, the serial search. To do this, you can use some basic tools.

However, if the number of documents potentially greater than the capacity of the search algorithm is to maintain a fast response time search important to divide into two tasks: indexing and searching. The indexing phase passes through the text in all documents and lists of key terms, often called the index, the more correct term concordance. In the search phase, when implementing a specific query is searched only for the prepared index, instead of the original documents.

Indexer creates an entry in the index for each phrase, or word that it finds in the document and its relative position in the document. Usually indexer ignores so-called stop- words such as prepositions and conjunctions that are too general and semantically irrelevant to the search. Some indexers perform language-specific modifications, such lemmatization (finding roots of words) and derivative (finding its derivatives, ie declension or conjugation).

Because of the ambiguity and the ambiguity of natural language, full - text index typically produces a list of words obtained with low accuracy - many of the items is irrelevant. Search using a controlled vocabulary (for example, a thesaurus, and others) solves this problem by annotating offensive words. On the other hand, search the controlled vocabulary has a low yield - can discard documents that are relevant to the search query. Despite the existence of many irrelevant documents in the index, free, free searches can be successful in finding a document that excluded driven search.

The problem of false- positive findings

Free search finds many documents that are not relevant to the intended query. Such documents are called false- positive findings. This is often caused by inaccuracies in natural language.

Some clustering techniques based on Bayesian algorithm (similar to bayes spam filter in Gmail, for example) can help reduce false- positive findings. So if you enter a query word "football", this technique can categorize documentary titled "American football", "football ", etc. depending on the occurrence of words in the document may fall into one or more categories. These techniques have been extensively tested in e -discovery domain.

Deficiencies free search can be eliminated in two ways: a tool to allow users to express their query accurately, and to develop a new search algorithm to improve search precision.

Improving Query Tool

• Keywords - Authors documents (or trained indexers) are asked to list words that describe the body of the text, including synonyms describing the subject. Keywords improve response, especially if the keyword list is not included in the text.

• Search fields - description are sorted into specific fields, such as the „author „or "Date Added ", the ability to search text only in designated fields.

• Boolean queries - the use of operators (such as „encyclopedia „AND „online“, NOT „Encarta ") can substantially refine your search, such as AND operator says „do not have any of the documents that contains two words together.“ Thus, the AND operator narrows, while OR expands. Improving the accuracy of detection is often counterproductive, and often leads to exploit the reduction.

• Search phrases - a document containing the exact phrase (a sequence of letters), such as „Wikipedia ".

• Concordance - search produces an alphabetical list of all key words located in the current context.

• proximity search - searches for the phrase of two or more words that are spaced apart by a specified number of words. For example, a search for „Wikipedia „WITHIN2 'open ' will return only those documents in which the occurrence of the word „Wikipedia „a maximum of two words from "open".

• The Joker characters - search replaces one or more characters in your search, such as Microsoft Word, use the "* „in the query „s * d „finds „barrel", „sad", etc. in the text.

• Regular expression - offers, although complicated, but extremely powerful query definition.

Improved search algorithm

Technological advances have significantly improved the performance and accuracy of free text search. For example google’s PageRank algorithm gives more importance to the documents referred to more links (links). This algorithm based on

data on the popularity of internet users increases the success rate and accuracy of retrieval.

2. SPECIFICATION OF PROFESSIONAL SUBJECTS

Current dynamic changes in our society is fundamentally reflected in the structure and functioning of the labor market. Individual profession is changing as fast as the demands of employers, which in turn requires a rapid response education and training systems. It becomes a common phenomenon that during several career changes one job, and it is increasingly also emphasized the need for lifelong learning.

National System (NQS) through sector councils monitors and records the performance requirements of various occupations in the labor market (see catalog). The result is an open, universally accessible database profession, which reflects the real situation on the labor market. Together with the National Qualifications Framework (NQF) will provide important information on the qualification requirements, which are then reflected in all levels of education. NSP is becoming an important source of information for human resources and professional education in all its stages, significantly strengthens the role of employers in these areas and becomes a base for future mobility and flexibility in the labor market in the context of the European Union.

Public tender National System of Occupations II is implemented in the framework of the Ministry of Labour and Social Affairs, which is co-financed by the European Social Fund and the state budget of the Czech Republic. Implementer procurement consortium, whose members are the Confederation of Industry of the Czech Republic, the Economic Chamber of the Czech Republic, TREXIMA, spol. s ro

What is NSP?

National System (NQS) occurs as a continuous development of the internet all available catalog, which reflects the real situation on the national labor market. It consists primarily of detailed description of the requirements for executor work in the form of general and vocational competencies. The primary source for the processing of this information is the work of Sector Councils. Sector councils are experienced experts of individual labor market (employers, professional organizations, unions, guilds, etc.).

The main objectives of public procurement NSP

• strengthening the role of employers in the development of human resources

• Creation of the profession - the basic source of information on labor market demands

• ensuring awareness of educators about the needs of the labor market for human resources

• Promoting labor market needs in the education system

• massive involvement of experts from the social and other partners in the process of collecting and processing information on skills needs of the labor market through sector councils

• increase mobility and flexibility in the labor market in the Czech Republic and the EU

Learning for a better labor market

Through sector councils are trapped requirements of the labor market in NSP. It contains a continuously updated job descriptions and type of positions, including requirements for the administrator. On the basis of this information is built up by the National Qualifications Framework (NQF), which mediates these requirements to educational institutions. They are thus able to prepare future graduates so that their acquired knowledge and skills to meet the needs of employers.

The main benefits of NSP

• serve as a source of current information for employers in strategic human resource management

• enable educators to transmit accurate and complete information necessary to describe actually employable skills that form the basis of NSK

• through sector councils enables representatives of the world of work to formulate their views and demands on human resources development

• simplify demonstrating skills necessary to perform the specific job or profession in EU countries (in line with the methodology of the European Qualifications Framework)

In the catalog you will find occupations with the most recent information on occupations in the Czech labor market - their content, the necessary knowledge and skills for work, wages, vacancies and more. You will get an idea of what I know and know to be able to practice their profession? That tells you a central database of competence for all professions with whom Catalogue of the National Occupations System works.

An example of some competencies required for the performance of the platoon commander of land forces Army of the Czech Republic.

Platoon commanded a platoon or her on a par with units built and manages their activities, subject to the command of the company commander.

Operating activities:

• Managing and organizing activities squad leaders in their submission.

• Coordinate and responsibility for the required combat skills team squad.

• Management and coordination of activities related to ensuring combat readiness team squad.

• Performance management professional activities in operating the weapons and weapon sets.

• management of cooperatives in performing tasks on infantry fighting vehicles, armored vehicles, tracked vehicles

• providing service and repair technicians assigned to platoon

• Managing and organizing activities squad leaders in their submission.

• Coordinate and responsibility for the required combat skills team squad

• Management and coordination of activities related to ensuring combat readiness team squad

• Performance management professional activities in operating the weapons and weapon sets

• management of cooperatives in performing tasks on infantry fighting vehicles, armored vehicles, tracked vehicles

• providing service and repair technicians assigned to platoon

• Planning of physical training and accountability for good physical condition members of the unit in accordance with established standards for soldier

• Evaluation squad leaders based on the fulfillment of duty, their motivation for career development and skills

working conditions

Man is exposed to considerable burden on the working hours of a shift.

Qualification requirements

The best preparation for this position provides a bachelor's degree program in management theory and use in combat units of the Army. Another alternative is the Master's degree program in the field of control theory and use in combat units of the Army, Bachelor's degree program and the Master's degree program.

There are also a function of the listed soft skills, generic skills, expertise and skills and health conditions. This information can be found at www.nsp.cz.

3. Searching for professional information

Information for professional topic can be found both in full-text databases and

database systems, sorting the menu according to various criteria. Sometimes in the form of advertisements - snippets of the structure, but above all you have to do selection (restriction) by entering the appropriate query.

Here you can enjoy the official app of the Ministry of Labour and Social Affairs of the Czech Republic, partly agency, project created under the European Social Fund (ESF) and sectoral portals such as www.army.cz.

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The tasks for independent work:

1. Analyze the possibilities and restrictions of selection in obtaining professional information.

2. Possibility of professional orientation in their chosen profession - specialization.

3. Make a list of basic professional concepts for resource discovery.

Chapter G: Information systems

1.THE USE OF IS

The emergence of systems theory was caused practical problems with the growth of complexity of technical and economic projects. The system is characterized by the emphasis on certain concepts and properties by looking and practical use of various scientific disciplines. With the use of systems theory can be found from philosophy, through physics and engineering applications to computer science. Therefore, we find different definitions of the term:

System

The system is a collection of related elements combined into a meaningful whole. The system consists of parts which are connected to allow the flow of information, material or energy. The term is used to describe entities that interact and which may be created by a mathematical model. The subsystem is a system that is part of another system.

System:

1. organized set of ideas, principles, doctrines, grouped to explain the internal organization or business unit
2. set of selected principles to solve certain social problems (social systems)
3. set of components (elements) that interacts to fulfill some goal
4. regularly influence or interdependent group of items, which is understood as a whole.

Classification systems

1.closed (conservative, autonomous) x open
- Depending on whether they occur (open) or does not occur (closed) interaction with the environment,
a) In an open energetic and information exchange with the surroundings, process unexpected input values are adaptive, react in such a way that their continued existence.
b) A closed system is completely isolated, not with their surroundings no ties suffer from entropy or disorder.

2. deterministic x nondeterministic (stochastic)

Deterministic systems operate and are governed by a set of predetermined rules and laws, their subsequent behavior is uniquely determined by the current state, the characteristics of the system and the input variables.

Nondeterministic systems are controlled by random events, their behavior is likely due to more than certainty, the set of rules that determine the behavior of the system is unknown or too complex and extensive.
Deterministic and non-deterministic elements
If the behavior of the (output) is determined uniquely by its inputs and internal state classify it as an element with a deterministic behavior. If this is not the element denoted as an element of nondeterministic behavior.

Stochastic

The element with the stochastic behavior can describe the behavior described by stochastic dependencies, the elements are thus inputs, outputs and states are given random variables. Views that describe the specific behavior of the element are called stochastic processes. According to the shape of the time set to distinguish the discrete case - with the ultimate or spočetným set of time points, or continuous elements - form a set time interval, stochastic elements. The transition from one state to the non-deterministic element of the second, or output corresponding to a given state is assigned a certain probability.
The boundaries of a neighborhood
The system boundary defines the system itself or separating multiple systems. The logical boundary is an imaginary boundary and defines the subsystems within the system, but the area is already visible boundaries. Elements outside the boundaries influence the behavior of the system.

Distribution systems

Systems are divided as follows:
• closed × open - depending on whether the interaction with the environment occurs,
• × deterministic stochastic - i.e. clear or random behavior,
• static × dynamic - i.e. linear or differential (the system remembers the internal state)
• Continuous × discreet - depending on the time of events (or ex. Well combined).
The systems generally divided into hard and soft. Hard systems are associated with one specific (structured) problem (mostly technical systems), while the soft systems performs a number of factors are more general.
Feedback and system development
In systems may experience feedback, when an output value again affects one of the input variables, and thus the system itself. The manifestations vary according to the influence custody.
Some systems spontaneously develop stability (dynamic or static balance), which may result in higher fragmentariness (dissipative systems) or vice versa, or greater orderliness of organization (self-organizing systems), some on the contrary tends to be unstable, leading to the destruction or revolutionary conversion system, the disaster.
Mathematical analysis provides a mathematical apparatus for the description of systems development (calculus, Fourier transform, etc.). Revolutionary scenario of systems theory deals with disasters.

2. INFORMATION SYSTEMS MANAGEMENT PROCESS

Nature has created (not yet fully known pathways of evolution) species homo sapiens - human thinking. The process of scientific and technological development has created a physical
symbol systems - automatic computers. Observation and study of human thought (intellectual) processes along with the study of symbolic processes technically feasible led to the emergence and development of the discipline of artificial intelligence
and the efforts to create a „thinking „computers - expert systems..
expert Systems
Expert systems are among the most successful applications of artificial intelligence. Since its commercial introduction in early 80 -ies of the last century has undergone explosive development and are currently used in many fields of human activity, such as in science, technology, production, trade, etc.
Characteristics of expert systems
Expert System (ES) - a computer program that simulates decision-making activities of experts to solve complex tasks using a properly encoded explicitly expressed knowledge acquired from an expert, in order to achieve the selected problem areas of quality decision making expert.
Expert systems are characterized by the following features (typically, a first feature, additional features are desirable, but may not always be present):
• separation of knowledge and the mechanism of their use (by the expert systems differ from traditional programs)
• the ability of decision making under uncertainty,
• Ability to explain.

In the literature we can also meet with the concept of a knowledge-based system (knowledge -based system), which is in an older concept wider than that of an expert system. Expert system can thus be understood as a special type of knowledge-based systems, which are characterized by the use of expert knowledge and some other features, such as an explanatory mechanism. Recently, however, there is a blurring of distinctions between these concepts.
The structure of the expert system

The expert system includes the following basic components:
• Knowledge base (general knowledge of the subject)
• base data (data specific to the case)
• control mechanism
• I / O interface (user development, linkages with other systems)
• explanatory subsystem,
• current model.

Types of expert systems
Expert systems can be classified according to various criteria. According to the content of the knowledge base expert systems can be divided into:
• problem-oriented, the knowledge base contains the knowledge of a particular domain.
• Empty (shells) whose knowledge base is empty.

According to the nature of the problems can be divided into expert systems:

• diagnostic, whose task is to determine which of the hypothesis of a finite set of pre-defined target hypothesis fits best with the data relating to that particular case.
• Planning, which usually solves such tasks, which is known to target solution and the initial condition and must be using the data on the specific solution for the case to find a sequence of steps that can be achieved.

Building expert systems
By creating expert systems dealing with knowledge engineering (knowledge engineering).
In the process of building an expert system, the following actions occur:
• Hardware and software
• user interface design,
• acquisition of knowledge (knowledge acquisition and representation)
• Implementation,
• validation and verification.

EC applications
To make sense to use an expert system for solving a problem must be fulfilled following two conditions:
It must first be a problem or a complex range of uncertainty relations for which an exact solution method is either not available or is not able to provide solutions in the required time.
Second effect resulting from the use of expert system must outweigh the costs. This means that it should be a problem with the need to solve recurring and significant financial impacts for which human experts are expensive or limited availability.

Advantages of expert systems:
• Ability to solve complex problems,
• availability of expertise and reduced cost of their implementation,
• sustainability and repeatability of expertise,
• training tool for beginners
• preservation of knowledge professionals from leaving the organization.

Disadvantages of expert systems:
• Risk of failure in different conditions,
• Failure to recognize the limits of its applicability.
BCG matrix
BCG Matrix, the concept of marketing and management, indicating the model portfolio strategy, which was developed by an American company, „The Boston Consulting Group“(BCG away). The matrix shows the connection between the pace of business growth and competitive position of companies. Used primarily by managers as an aid in the management and decision-making about resources. In the area of warehouse management shows us depending on finances, attractions, selling goods on the market, the possibility of an increase or decrease in inventory.
The analysis of the portfolio is the Boston Consulting Group Business matrix (matrix).
Using the matrix takes place in three steps:
First division on strategic business unit (SBU, strategic business units)
Second mutual comparison of SPJ and their benefits
Third development strategic objectives with regard to individual SPJ

According BCG matrix are strategic business units divided into four quadrants, depending on the market share of each SPJ occupy and what is the expected development of a competitive neighborhood.
quadrant of the matrix
Individual BCG matrix quadrants are called: Question marks (English Question marks), Stars (Eng. Stars), Dairy cows (Eng. Cash cows) and Miserable psi (Eng. Dogs).
Question marks
It is a stage products to the market, require substantial financial input, but the chances for the future. Market decides BCG matrix if further invest in them or download them.
stars
Products that have the best business results in terms of growth, turnover, and in market share. Keeping these results, it is also expensive, but the result is a high profit.
dairy cows
The main financial support of the company, bringing high profits, without requiring greater financial investment. It promotes the development of new activities, or cover losses from decay products or non-profit activities.

miserable dogs
This includes products that will end his commercial career. It is at the discretion of enterprises, as long as it pays to keep the product in the market and promote the sale of enhanced marketing policy.
It is clear that each product is gradually changing its position in the portfolio. Analysis of current developments and the likelihood of future development of these positions are very good basis for setting marketing objectives.

3. BENEFITS OF IS

A large number of executives complain that invested hundreds of thousands and millions of funds to the information systems they did not bring the expected benefits. Interesting findings do when these workers ask what benefits expected. Many of them can not even name the specific benefits both in kind and in terms of the expected level, while others will bring benefits such vague aphorisms like, we expected a decisive increase of management, substantial improvement work in the company, better information about the company's operations, etc. Certainly you are rarely, and only some are able to show a document that was prepared at the beginning of the implementation of an information system in which they were explicitly enumerated the expected benefits and putting their estimated amount. Even more interesting is the reaction of those lamenting owners, entrepreneurs and managers

Situation.

One part despises computing and information technology in a way that does not sign in the following several years of a penny for any electronic device, which results in profuse lagging behind their companies
Data processing and communication to reduce the impact on the competitiveness of the company.

The second part is still moaning, but without an analysis of the causes and acceptance of rational action without further recklessly invest in the most expensive computers in blind faith that the higher end
and expensive technology buys them by this technique will bring a greater effect. Of course,
the reality is different. The header contribution referred motto wants attention the fact that missing the target, where we have directed our efforts, it is difficult to discuss the end of the road, that here we really did not want to happen. Therefore emphasize several mistakes which lead most companies make when launching projects to build new, or upgrade existing systems.
Poor putting priorities
Under the impact of advances in information technology managers often deal with from the beginning, what information technology firms to introduce
and how.
They confuse the means for goal! It is important to be able to answer the question, why should we invest in certain technologies, what benefits can we expect in its use in relation to our business plan resp. to increase the competitiveness of the company. The following diagram shows how to change the meaning of asking relevant questions during the project information system. The figure shows that the question of how high a priority is getting to the end of the project which addresses the technical issues:
Headless belief in the miraculous power of technology leads some executives to an overestimation of technical resources and the neglect of the need to ensure adequate
transponder modern technology and processes.
The relationship between technical means and processes can be illustrated as follows Boston matrix:
If we accept the foregoing brings us to the idea, to make improvements to existing processes (Business Process Reengineering) before it is an information system. Just reach their high benefits.

Under the influence of yesteryear substantial portion of executives identifies the concept with the concept of saving benefits. While reducing its own costs is the order of time, and it would be a mistake to reduce costs by searching savings neglected, it must be emphasized that the benefits (as opposed costs) are collectively represented by:

Savings
Savings are characterized by differences reduced costs in the period before and after the introduction of an information system. Savings can not be greater than the costs incurred therein lies the limitations of their size (eg: Savings of wages for workers whose work we replace the computer, saving office paper, although the results are shown on the screen, etc.).

Revenue
(Example: Receiving money for services which the company introduced in computer science.).

The advantages

The use of advanced information technology allows to obtain a competitive advantage over other firms. This advantage can be assessed with benefits that far outweigh the costs (Eg: A company that invests in flexible automation in the production of the current possibilities of connecting the orders of their products over a computer network, can get 50% more customers compared to the previous period, as the company is able to meet the special requirements of customers in a much shorter time than the competition).

Opportunities
In the current market economy, it is imperative that entrepreneurs were able to quickly take advantage of opportunities that arise in the market, and this is what they can help information systems (Eg: Many managers are different possible contracts know they were passed simply because they do not have information printed to tenders in your field. Companies that build a perfect information system in this field, will have more opportunities to apply their offer and get the job).
In particular, the last items listed benefits of the market economy can be crucial and it is a pity that entrepreneurs and executives often are not able to think in these categories!

Unfortunately, these categories often are unable to think or suppliers of information systems for which it is convenient to supply the computers and programs and to care any more.

Specification of benefits
The benefits must be individually qualified and dedicated, and quantified. It must be accountability for achieving them, the deadline and the method of evaluation. Determination of the method of evaluation is a very important fact. Method shall be objective and agreed upon by all stakeholders. Basically, it is necessary to reject the subjective assessment of benefits (eg: Workers in different departments of the company fills out the questionnaire, indicating how they believe they helped computing: a lot, a little or not at all, is an example of an unacceptable rating benefits.). The benefits we should be able to objectively measure!
If such an objective evaluation can not do or can not do, we would not have such a benefit to be used to evaluate the usefulness of the information system.
It is necessary to ensure the registration and reporting benefits. Many benefits are ignored simply because their presence was not being followed.
Evidence and monitoring often requires spending some effort and some time. Therefore, this activity often causes resistance. We try, that the information system itself can not automatically perform such records.

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The tasks for independent work:

1. Go through the first category and the use of IS and analyze context.
2. Explain the importance of IS management process - expert systems.
3. Enter the benefits of IS and examples from practice.

Chapter H: Task delegation

1. USE OF TEAM ROLES, DELEGATING TASKS

Team is a group of people together who has a job or wants to achieve a certain goal, which is only possible with the cooperation of all members.

 In sports team denotes team, sports team, possibly including support personnel (e.g., coach, doctor, technical staff, etc.)

 The Company consists of a team group of collaborators who are working on the same task - working group.

The importance of cooperation among people of different professions in the common task appeared in the mid 20th century and the word „team „has become almost a fashion. The research suggests that the right team size naturally depends on the task, however, the socio-psychological point of view it is recommended that 5-12 members, the greater the good teams divided into subteams (subgroups). The team may or may not have a formal leader; both solutions have their advantages and disadvantages.

In groups or teams in organizations place considerable, sometimes overwhelming part. If we denote however, a group of employees as a "team „does not mean that the team really is. Teamwork can in a number of areas to increase productivity.

It can improve control and enhance employee satisfaction. Creation and management teams may not be easy, especially because they face some control stereotypes. We will address the principles of creation and management teams, key to the success of teamwork and the most common mistakes people commit to leading teams.

Talk about teamwork can be when it is interacting group of people united by a common goal, shared ownership and responsibility, mutual trust and common accepted rules of cooperation.

Unlike normal working group has, however, both the team and certain powers relating to the possibility of jointly decide on procedures, organization and distribution of their work on the introduction of innovations, etc. The team is often created temporarily, to fulfill a certain task, but it can still work well, especially true if the charge is relatively complete work tasks with clearly defined results.

Prerequisites team

Teams usually more easily formed from smaller groups, preferably in the range of 6 to 10 persons. It consists of a group of workers usually different, complementary skills who hold the team somewhat different role, a role not only professional, but also the tasks relating to the organization and coordination of joint work. The most

productive teams are usually those in which are represented by a person having the ability to play a complementary team roles. Prerequisite for successful business team is a certain degree of control or decision-making autonomy, ie the possibility and ability to take on the organization of joint work and work without daily intervention, but also support manager. The team therefore requires a different way of managing.

Why to create teams

Teamwork is desirable in many situations and in certain essential. Necessary is where the performance of a task or find a solution foresees cooperation with a range of specializations and professional knowledge, usually from different parts of the organization. Important is also in cases where the individuals should move away from the pursuit of their own narrow interests and work together in the interests of the company as a whole. Teamwork is not always apply. Where teamwork is essential when it may increase productivity, but the inability or unwillingness to create teams expensive. The reasons why teams are successful, that is why people in well-managed teams reach compared separately working individuals (or groups controlled by command) often have higher productivity, not complicated. The reason is that teams can:

 Reduce costs, among other things, due to the limitations of management intermediaries,

 work flexibly, mainly due to the direct transfer of information, open atmosphere and closer personal relationships,

 increase work motivation, and given the opportunity to work independently and to participate in decision-making team

 strengthen accountability workers due to their joint ownership of mutual control of their work,

 better or more creatively solving problems, thanks to the combination of different skills and experience of individuals.

Creating a team

Create a permanent work team takes time, but at the same time the leadership and support from the supervisor.

The manager's role in creating a team:

 Achieve team cohesion, i.e. that members understand the interdependence and shared responsibility including what their membership of the team personally and as a group brings.

 To help familiarize the team with the skills of its members and to find individual team members appropriate role.

 Together with the team to deduce the main rules of teamwork and the main barriers that hinder teamwork.

 To learn team work with a certain degree of autonomy (corresponding to the nature of its tasks), ie it gradually transfer the wider decision-making powers and accountability.

An important issue is building a team and a selection of its members. Not every employee is a „team player „able to work together to meet common goals and not everyone fits into any team.

Leadership team

The management team can work in two main ways. Either way, the manager, who is subordinate to the team, the team's work directly involved, but works as one of its members equal, ie as the leader or spokesperson. Or so that the management team is the task manager, which is becoming one of the team members (can be set by a manager or team members to be elected, or may vary with the nature of the tasks that the team resolved). The manager in this case does not interfere with the management team immediately and act in relation to it more as a coach.

The main tasks of the team leader or manager appointed by the elected members usually include:

 Monitor whether the team's work not depart from its target,

 strive to ensure that all team members feel part of the team and had a role,

 check the compliance team and initiate periodic self-assessment method, how the team works,

 support issues and different points of view. The best decisions come usually through the pooling of different perspectives,

 seek opportunities to enhance the participation of people in decision-making team

 see the relationships in the team, solve problems and destructive conflicts among team members,

 distribute recognition among team members,

 highlighting the achievements of the team, even small successes to celebrate the team accordingly.

Errors associated with the management teams typically associated with three reasons:

 S misunderstanding of what the team and its management differ from regular working group

 reluctance to change managerial behavior that enable teamwork,

 inability to overcome barriers to achieve coherence, cooperation and mutual trust of people forming the team, especially at the management teams of the company.

The main barriers to teamwork

The key management, organizational and human barriers preventing the emergence or the successful functioning of the team include:

Unclear objectives. The team is more effective the more clear is the common goal. Unclear or changing goals and priorities can defend and allow the team started to really work.

Lack of leadership. Effective team must have a leader. The leader may be appointed or elected, may well gradually „crystallized „as a person with a natural authority and credibility of its tasks it must perform.

Personal interests. The success of the team requires that all its members follow the common goals. To override the personal interests of individual team members can contribute way of compensation, however, is usually crucial role of team leader.

Unproductive conflicts. Successful teams require challenges and conflicts, otherwise they lose their coherence. Conflicts should, however, be productive, ie the result or solution. Conflicts that focus only on the negative aspects of the person or team are unproductive and should be removed.

Excessive size of the team. Successfully working teams are usually limited in number groups whose people together tightly together. The limited size of the team and personal cooperation are important, inter alia, for the mutual control of the work of individual members.

Inappropriate selection of team members. Not every employee is a „team player „able to work together to meet common goals and not everyone fits into any team. Suitable are persons who prefer to work independently or lack of trust. On the contrary, most effectively work teams, in which are represented by people with different capabilities and other conditions.

Inability manager or team leader to handle the problem behavior of its members. Examples of problematic behavior impeding the successful functioning of the team are individualistic and self-centered focus of individuals at the expense of the team as a whole, but the effort to dominate search personal awards, not to engage in joint efforts to block the work of the team, etc.

Limitations of teamwork

In the production and use of teams must respect certain restrictions. This is a situation where teamwork is not necessary. If they are not employees of teamwork

yourself interested, it is not appropriate to force it. Inappropriate use of teams is usually even if by teamwork:

• She fought talented individuals or appropriating the results of their work,

• limited control responsibilities of managers,

• led to excessive rivalry against other teams.

Another limitation of teamwork bring situations where:

• One person has significantly more knowledge and experience in this area than anyone else,

• there is already a solution, ie a manager or a company already know the "right answer"

• the task is in the standard job description of one of the collaborators and the worker gave impetus to build your team,

• to discuss the problem of not enough time

• If people prefer a more productive working alone.

Advantages and pitfalls of team decision

If reigns in the team atmosphere of trust and open and if its members tend to stimulate and inspire each other, may be his decision imaginative. The advantage of group decision may be that prevents solution was adopted too quickly and without full knowledge of the facts. Together, the decisions are usually also more support and therefore easier to enforce.

Team role

Belbin's work identifies nine different types of behavior, each of them is called team roles. Each team role has its own combination of benefits and allowable weaknesses. Team Roles describe patterns of behavior, but they are not immutable and are affected by many different factors - such as changing jobs. Each output is only an image of your behavior at a given time. Description of team roles in the presentation.

2. PRINCIPLES OF TEAMWORK

Implementation team to deliver on the objectives of the project, it is necessary to use modern methods of teamwork:

• Workflow

• Groupware

Workflow

Workflow (Workflow, technological progress, course work operations) is implementing a comprehensive scheme of business (process), broken down into simpler activities and their links. Usually, this term describes technology management, project and document processing.

To support workflow there are a number of specific software products, which is a predefined system such as internal processes in which the use of document digitization, circulation of documents in electronic format and archiving of documents according to defined processes are defined, who has done what activities of a given process or thread to after the implementation of the project.

This software has defined monitoring the performance of particular tasks (threads) and approval steps to complete the project.

Workflow system consists of four components:

• Tasks - activities that must be performed to achieve business goals

• People - carry out tasks

• Tools - Applications execute tasks

• Data - two types: the factual details and the details of the process ; documents, databases, reports, etc.

Groupware

Groupware (also used expression systems for collaboration) includes computer tools conducive to cooperation between people (eg employees) on a common work. Using these individual group members can communicate, share various documents and organize their cooperation. Do groupware include electronic mail, discussion forums, chats, calendars, tasks, document repository, various „wiki“tools and more. There are both individual applications fulfilling this functionality and comprehensive packages (eg Lotus Notes, eGroupware and more, see the English summary of products). Groupware can facilitate the work of virtual teams and groups working remotely.

Communication, different types of systems (or applications), such as electronic mail, bulletin boards (bulletin board) and discussion forums, live discussion (chat), video conferencing, and various combinations thereof. For the group of people working on a project together, cooperate, it needs to store a document in which it is stored and easily accessible to all collective work, and some space for public debate. By means of cooperation also includes message boards, for example, which offers the ability to share data on questions and answers or other knowledge within the group. So everyone has access not only to documents created by others, but can also modify itself. Better document management systems not only enable competitive access to a single document and role -based access control for each user group, but also offers access monitoring, archiving, document versioning and more.

An essential need of the team is scheduling meetings or other public events, helped schedules of individual members. Furthermore groupware systems also contain a tool for assigning tasks and their control. A distinction is also specific instances of tools for collaboration, such as programmers. These tools include support for program code and sharing, commenting, etc.

The scope of application tools for collaboration is unlimited. By far may not be just a corporate environment where extensive work teams. In the limited form (only part of the functionality) is used by various groups of people. It can be:

- Work teams and groups working in one or more related projects
- Remote working group
- Virtual teams in virtual organizations
- Students on school projects,
- Teams leisure activities, such as various clubs, etc.

Examples of groupware:

- IBM Lotus Notes (client) + Lotus Domino (server)
- Microsoft Outlook (client) + Microsoft Exchange Server (server)
- Microsoft Outlook (client) + Kerio Connect (server)
- Novell Groupwise
- OpenText (http://www.opentext.com)
- Vignette (http://www.vignette.com)
- CONTACTOFFICE (http://www.contactoffice.com)
- Google Apps (Google Docs, Groups, Calendar, Gmail, Sites...)

3. METHODS OF TEAMWORK

Proven methods are numerous, so we will mention only the most important ones:

Brainstorming

Brainstorming is used to identify the source or cause in finding a solution to a problem. After assembling the team follows the introduction of all members with the theme and rules. The principle of this, probably the most commonly used method is to concentrate the maximum number of ideas and thoughts on a specific topic, good ideas are further developed in the same manner. Team Coordinator structured granted to individual members of a word, or left to the initiative of active members.

Each stands for itself. Applies here, that no idea is not bad, the imagination has no limits. Ideas to criticize. The output is a sufficient number of prioritized depending on the quality. The following phase clarifying and finished off with a general overview.

Brainstorming primarily develops analytical thinking and creativity. The total duration of this method is about twenty minutes to one hour depending on the present problem.

Brainwriting

Brain writing is a method of teamwork derived from brainstorm. The aim is also concentrating the maximum number of ideas, but with the use of written forms (cards) in a short period of time. Like any other technology, even this has its own rules that must be respected team. To formulate ideas on cards is recommended that the „1-3-7 rule ", which is one story, three rows and a maximum of seven words. This leads to a clear, concise and understandable terms.

Delfi method.

Delphi method is based on the gradual questioning, comparing, and evaluating the response of selected experts of the field for a particular problem. Given that the method should be anonymous (the composition of the team usually knows only the coordinator, members remain concerted anonymous) to be compiled formalized questionnaire, which should cover any of developments and inventory of existing knowledge and views on current and future developments. Generally a maximum of 25 questions. The aim is to use statistical methods to define treatment group view on the future development of a situation where the forecasts are not available the necessary data, and the only option is to use the knowledge of experts.

progressive abstraction

At the beginning of the formulated problem, the causes of the individual team members using a short brainstorming trying to identify. The following is a suggestion of possible solutions and then their criticism. With the question „What's really going on? „Trying to formulate the problem to a higher level, thus discover the true cause.

Mind maps

Use mind maps are especially useful for mapping and defining the problem to the analysis and the subsequent creation of its exact structure. This method supports the ability of analytical thinking, and it is required to look at the problem from multiple angles. The main advantage of this method is the possibility of a comprehensive view. Mind maps are created using key words, ideas, different images and symbols, or custom tags. We begin by the middle of large paper or board write the central problem. Then create a few main branches, over which we write the main ideas and further develop these thinner lines. Each theme or point of view should have its own color. Mind maps are suitable for the precise formulation of ideas and proposals for complex projects.

Morphological (structural) analysis

The goal is to get through a combination of selected parameters of the investigated problem solutions, which in practice do not yet exist, and subject it to analysis from the viewpoint of their practical use. In this method, the compilation of a matrix in which each row represents the characteristics (parameters) of the examined problem and columns to these characters are assigned all possible embodiments. Parameters affecting the problem comprehensively and against each other logically independent.

Methods based on association and analogy.

These methods provide a completely unconventional ideas to solve problems, and there are a number of different modifications. The aim is to disrupt the settled view on the problem and get unusual and original solutions.

Advantages and disadvantages of teamwork

The main advantages of teamwork include a considerable increase of labor productivity in areas that require creative solutions to various problems and a degree of flexibility. Building consensus among team members excludes extreme attitudes and beliefs. Team members can creative solutions to inspire each other. Mutual cooperation improves communication can strengthen trust and enables mutual support in the accomplishment of the task. The team is able in certain circumstances to take better decisions than individuals.

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The tasks for the independent work:

1. Use the basic information on the principles of teamwork in the development team and roles.

2. Think about what to look for when building a team.

3. Characterize the method to work in a team.

4. Strengthen team bonds and responsibility for meeting the objectives of the case study.

Chapter I: Time management

1. GENERATIONS OF TIME MANAGEMENT

Time management is a set of practices, recommendations and tools for planning of time, usually for the purpose of increasing the efficiency of recovery time. Time management currently includes a wide range of activities among which include planning, allocating, setting goals, delegation, analysis of time spent, monitoring and prioritization. Initially, time management was used only for business or work activities, but over time, this field because of increasing demands on life has expanded to include personal activities.

Personal Time Management

Time management strategy should always start by setting personal goals. These objectives should be recorded and can be divided into project management, action plans or simple task list. For individual tasks or goals may be subsequently determined importance and can also be set deadline. The result is a plan -do list, schedule or calendar of activities. You can also set a daily, weekly, monthly planning periods associated with different evaluations. This is done in various ways, as follows.

Task list

The list of tasks (also known in English term to- do list) is a list of activities, activities and things that should be met by the author. It is a tool that serves as an alternative or supplement to memory. If a particular item from the list met, the item marked or removed. The traditional practice is to write such a list on a piece of notebook paper usually workbook. At present, there are lots of electronic equivalents, where you can find such a list and actively use it (PDA, mobile phone, PC).

Organization of task list

Task lists are often tiered. The simplest system contains a generic list that records all the tasks that a person needs to achieve at a given time. Furthermore, the general can go on daily list which is created each day by transferring tasks from the general tasks.

Allocation of priority:

 Based on the experience can be individual items in the list to assign a priority. One of the first who suggested the method of „ABC“importance was Alan Lakein. In his system stands for „A“ item of great importance, "B „ is an important item and „C“ is the lowest priority.

 specific use ABC method is to assign „A“ tasks to be processed during the day, "B „ during the week, and „C“ during the month.

 Other very advanced systems are:

Sort the list items in order from greatest priority,

the numbering of all items in a list, where „1“denotes the highest priority and "2“the second highest priority. This list will then inform the order in which to perform each task.

 A completely different approach, which opposes the importance of setting suggested by British author Mark Forster. His idea is based on a closed list of tasks, which suggests that the endless list certainly means that any task will be skipped and incomplete. His approach and builds on that should be the entire list fulfilled the same day, and the items that were not completed should be done to determine where the error was and what needs to change.

Time management first generation

The first generation brought about the establishment of order in the tasks and activities. The outcome was summaries of tasks and activities and their links with persons and sources of their collateral. The former theory dealt primarily what we do.

Recording task in the To -Do List (simple notebooks). The advantage was its ease of use. The downside was that there did not record the priorities or deadlines. A completed task is simply called or struck. These disadvantages are so fundamental that it is nowadays hardly used.

Time management 2nd Generation

The second generation of assigned tasks and activities to chronology. Was established timetable. Calendar or diary with tasks. Tj. what and when to do.

Planning with simple work calendars or diaries. For each of the tasks were already recorded deadlines and includes setting goals. Established clarity that enabled predict occupancy of the day. Predetermine completed tasks in deadlines. The disadvantage was that there was no significant record multiple events in one day. Assess the situation had by the user. Decide which task has a higher priority will be given to or move to a later date.

Time management 3rd generation

The third generation address priority to achieve the goals. Thus begins by defining goals and their strategies and specific tasks in time. It deals with the determination and definition of objectives and strategies to achieve it, that is how, what and when we do. The defined objectives and their corresponding tasks looking priority. Tj. so-called active approach to the problems of man and his activities. These systems are the most widely used especially in professions such as IT developers, development teams, lawyers, consultants and many more. This system allows to set the value of a single task and priority. The third generation can decide which tasks have a higher priority and give them priority. To prepare the necessary planning,

prioritization and subsequently custom control using a personal organizer, desktop, or PDA.

Individual tasks are identified:

 numbers where „1“represents the highest priority and "2“is the second highest priority.

 letters ABC (analysis prioritization). Letter designation means:

o „A“ item of great importance,

the „B „ is an important item

o „C“ is the lowest priority.

Lack of time there. We all have enough time for us to do what we really do. (Alan Lakein)

Time management 4th Generation

The fourth generation begins from the self of man from his individual values , with emphasis on the personality of his good feeling, serenity, shape, good relationships. The key is to achieve well-being through the understanding of the strategic role, mission and priorities of the individual. Priorities are assigned goals and follow-up tasks, not vice versa priority tasks. Why, how, what and when.

More important than the results is the strength of feeling that we are moving in the right direction. In the fourth generation, we talk about a proactive approach to human problems and activities to your life and its organization (co -directed logic and emotion).

It is a tool for long-term management system life (life management) than the classic time management. It streamlining all of the above instruments. Each time management predecessor gave something to his next successor. It is complemented by life's purpose, mission and aspirations of its users, etc. It helps him determine what is important in life and according to subordinate everything else, including planning time. Always planned for the week and the week before commencement. The time that we stayed in planning can be enjoyable as current events. The development of time management is certainly not yet completed. The environment in which people live, is constantly changing and it is likely they will continue to increase demands on the use of time, which time management will want to meet.

In that generation who are now located? As one practically people are at differing from them. According to his experience, education, experience and, above all, a personal individual natures and mental facilities.

Categorization

Based on the work of Stephen Covey planning methods can be divided into several generations.

 First Generation: Reminders for some time with alarm (clock, computer). Mainly used for warnings before performing any task.

 Second Generation: Planning using the calendar or diary ; includes setting goals.

 Third Generation: This approach means spending some time setting values and priorities. To prepare the necessary planning, prioritization and subsequently custom control using a personal organizer, desktop, or PDA.

 Fourth Generation: It streamlining all of the above instruments. Introduces places, objectives and role as system controller and prefers the important tasks over those urgent.

Software Applications

Modern software applications have built-in modules for processing tasks and can support a number of methods for filtering and sorting the list of tasks. Among other functionalities can also be dynamically determining the current challenges that are being processed. Many of these programs even supports management tasks for multiple users. One person can assign tasks to other people.. The list of tasks can also be part of some other instrument, such as a personal information manager or project manager.

Techniques for setting priorities

There are several techniques for setting priorities. Examples include ABC analysis with Pareto analysis.

ABC analysis

This technique is used to categorize them into groups. These groups are often identified by the letters A, B and C. The tasks are then labeled according to the following criteria:

 A - Tasks that are perceived as urgent and important.

 B - Tasks that are important but non-urgent.

 C - Tasks that are not urgent or important.

Each group is then sorted by priority. ABC analysis may have more than three groups, which result from its designation. ABC analysis is commonly combined with Pareto analysis.

Pareto analysis

This analysis is based on the fact that 80% of tasks can be completed in 20 % of the time we have available. The remaining 20 % of tasks will take 80 % of the time. This principle is based on the division of tasks into two groups, where the recommended tasks in the first group to assign a higher priority.

Pareto principle can also be used to increase productivity: it is assumed that 80 % of the productivity can be achieved by completion of 20% of the tasks. If the goal is greater productivity, then they should have the first group of higher priority.

2. TEN HINTS OF TIME MANAGEMENT

Time can not buy or borrow. We all have exactly 24 hours a day and it is up to each of us as this will load time. Everyone can use it on their own. Time is running very fast, and not everyone are well aware of this fact. It is a pity about time to come...

Thus we can take advantage of your time true maximum, deals with Time management.

Rules for effective Time management

Time management today bothers many people, not just any manager. Therefore, there are a few rules that we should follow and keep them in mind. To follow these rules is generally simple and does not cause us any special problems. Rather, it is important to stop and think and be the master of your time...

The Ten Time Managament

1. Prioritize

It is very important to be able to set priorities. Everyone should know what you are important to them and what is not. These priorities should be kept in mind and not to allow urgent matter ousted important.

2. Reallocation of responsibilities

What can others, whether others do. So it would be possible to explain the concept of delegation. It is not possible for one person to do everything. Based on the priorities selected, select the activity that is most important for us, who control the best and most fulfilling to us. All other obligations then you can delegate to other people. They execute this activity much better and easier than we have done it ourselves. They have different priorities, different interests, different options.

With this rule are the biggest problem especially suspicious of people who think they are irreplaceable. He wanted to get everything done by yourself and nobody else can not do it like they do. This attitude is not appropriate and certainly it will soon pay the price.

3. Effective use of tools

We try to make effective use of the best tools we have available. It will save you a lot of trouble, trouble, and especially a lot of time. If we use unsuitable tools (you do not want to buy new because of the great cost or laziness), it may very well be that eventually you will lose a lot of time and we can not avoid stress, which was just a time-consuming task. It is therefore necessary to get a good (useful) tools and use them.

4. Systematic planning of time

It is important to be able to effectively plan their time. We use a lot of planning aids. These can include very famous diary, for example, or planning software. If your mandatory registration and schedule, we will get a comprehensive view of our workload, it is easy to specify additional obligations and to avoid potential time conflict.

5. to say NO

A common problem is just that people can not (or will not) use the word not. People believe that this is a rejection, but this is not true plastered offer, not a person. It is necessary to clarify things for us that bid is what will bring us advantages and what we in turn can cause inconvenience. Saying NO is especially important if he wants to prepare us some of our time that we have designed for more important things.

6. Ability to „swipe "

Not all things we can do. But it is important to realize that one thing / activity if someone else has done better, faster and better. Be able to estimate in time at which the activity is not fit is a big advantage. This saves a lot of time...

7. Awareness

Nowadays, information is very important and valuable. It was timely and complete information is the key to a good mastery of time. If you are, however, some information is incomplete or even incorrect, easily get to the wrong assessment of the situation. The success of the manager or the company is not in the speed with which they move workers, but much more in the speed with which information is processed.

8. Interferences

The big problem may be just distractions such as phone calls, visits, sudden and undeclared advice... You need to know these disturbing influences successfully defend. An unexpected phone call can very significantly disrupt the operation being executed. In particular, if the content of the call is bad news, one can be „scattered „and is no longer able, after some time of concentration.

9. Time reserves

Create in your plan and time set aside for any unscheduled tasks is also important. The ideal plan is about 60 % of the time and the remaining 40 % to keep the eventual spontaneous and unexpected activities. If you do not own schedule no free time period and where he does not slack just for this case can be a very uncomfortable situation. It can be a stressful situation and mismanagement of selected targets.

10. Arrangement job

Apparent little things like layout and organization of your job may be very crucial. Suitable arrangement creates conditions for effective work, avoids unnecessary and time-consuming search. The disorder is often created by ignorance of how to organize a job, sometimes the system is forced on (unknowingly) colleagues or superiors. Each, however, has its individual spatial intelligence and accordingly must organize their work place.

3. TECHNOLOGY TO PRIORITIZE TIME MANAGEMENT

One of the most common situations that we deal with every day in the correct use of time is called a „spoiled?". Solve the problem of efficient allocation of its limited resources to various goals, tasks and activities. Way of working within the planned time management helps you to solve the issue forward, by setting priorities. every goal, task or activity must be determined in advance priority in relation to other activities so as to put into accordance consumption and renewal of their resources. Each group is then sorted by priority. ABC analysis may have more than three groups arising from its sign. If both factors - the content and timing of execution - will be put into the relationship, resulting from the following priority scheme:

quadrant I.

Activities: crisis, urgent problems, tasks with deadlines

Solution: immediately and personally resolved

II. quadrant

Activities Prevention, conceptual work, education

and training the next staff, develop relationships, exploring new opportunities, planning, recreation

Solution: plan now, futures, or they entrust someone else (delegate)

III. quadrant

Activities: interrupt some visits, and post some reports, some meetings, approaching emergency, favorite activities.

Solution: immediately delegate to subordinates, eventually. at the appropriate time to do it yourself

IV. quadrant

Activities: some mail, some phone calls, time wasted on unnecessary matters.

Workaround: unimportant and non-urgent tasks is the best paper basket.

4. CONCLUSION

The concept of time management is a traditional term, but it is very inaccurate label.

For we can not manage time. Time is the same for all.

We can manage yourself, your interests.

You can control what we pay attention to and what not.

We can decide whether we wasting time, or it will use.

There are five basic stages or rules that can help in effective time management:

1. Know who you are and what your goals are.

2. Share this individual perception of direction, priorities and actions to the goals of others.

3. Consider all the factors and relationships do not allow drove out urgent importance.

4. Think about the flexible options to achieve the objectives, and wider implications of the results achieved.

5. eliminate the time wasted by controlling stress.

Time Management Time Management or remove unnecessary stress, key time losing activities, setting priorities to achieve the goal. Place of work disharmony and privacy arises lifemanagement.

Ability to set the right goals, priorities and achieve them is probably the most important skill that you need to create a successful life

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The tasks for independent work:

1. Analyze options for each generation Time Management (TM).

2. Remember the principles of the Ten Hints of TM.

3. Create your idea of effective time management in your professional activities.

Chapter J: Data security and storage

1. SECURE ACCESS TO DATA ON THE PC

Given that more than 80% of security breaches in computer security is due to the human factor - the user, it must still this perennial threat given particular attention.

Each user should know that it is an integral part of a wider cyber security.

That the safety of the station is not just a matter of administrator, but that he himself is the safety of your workstation and the entire network is actively involved. Each end station with security breaches can happen interchange element for attack on other resources in the network. Therefore, computer security applies to all elements, even the most ordinary workstation. Each system is most vulnerable from the inside.

Appropriate choice of passwords and periodic change

For automated test tool is not a problem in a few minutes hundreds of thousands of passwords; password as they are not suitable common words (in the dictionary). Optimal neither the names of favorite movie or book heroes, the substitution of accented characters for numeric symbols located on the same key or using the data identifying the user (address, document number, date of birth, etc.). Passwords should, if possible, contain other than alphanumeric characters (e.g. characters.: ; - = + _). It should also be adequately long - say at least 8 characters - and it is sometimes necessary to change.

Protecting passwords and keys

It is not advisable to open the password in text form remarking anywhere - in your diary, the papers, the papers on a bulletin board, table, desk, computer display. If the user does not trust his memory, it is appropriate to protect the password encryption such as additional storage and use external media (floppy, CD - ROM, DVD, CF, Palm), which then must be adequately protected against theft. Password is obviously not desirable anyone to communicate and vice versa - do not want anyone telling you your password!

In the case of access to multiple services or machines that are not centrally authenticated, it is not good to use the same password everywhere. Remember to different services use different passwords is a bit uncomfortable, but lower user comfort make up for higher security for your data and programs.

It should also ensure the correct use of passwords. If you have for example a password to access your mail, it is not good to try this password ad- hoc for other services - especially

you did not, you know nothing about or which are in principle unencrypted (FTP). Generally, it is good to ask your administrator password that you gave to which services can be used.

Many users used to simplify access to remote servers ssh keys - typically when they need to work with multiple remote servers on which the passwords are managed individually. In these cases it is necessary to carefully consider where

You can store the private key. The optimum is to have a private ssh key is stored only on your workstation, although it may complicate the transfer of data between remote servers themselves.

Protecting the message content and identity

Users often do not realize how different services work. This leads to the misconception should be about who can get to their data and how. Probably the most typical example is electronic mail. Most ordinary users shocking mainly two findings:

 that the content of their messages can reach anyone who has the necessary knowledge and options (such as interception of network traffic or direct access file on the mail server). The only truly reliable way to protect data sent by e-mail, is encryption. Optimal protection is provided by a method based on asymmetric cryptography, such as PGP key and X.509 certificates.

 that anyone in the world can send an e - mail that will be sending the addresses listed as their address. That the items to every sender can insert whatever the user usually hear only when they come from the people themselves senseless e - mail, which knows that it certainly did not send. As in the case of content protection message and this problem has a solution - it is an electronic signature. An electronic signature is also the solution for the protection and integrity of the message. It makes it possible to determine whether the message has not been altered path.

The issue of message encryption and electronic signature will elaborate on some of the other articles.

Revocation of certificates and keys

The use of electronic signatures and encryption of message content motivates us to attempt to protect their data, their integrity and their identity. Equally, however, it is necessary to protect the privacy of keys (PGP, X.509 certificates) and to be prepared for the possibility of theft or destruction of the private key. In this case, it is important to quickly key revoked. Revocation (invalidation) the owner of a key or certificate says his electronic signature may no longer be trusted. In the case of the destruction of the private key is reasonable for the user for this option timely prepared ; for example, that already in the key generation at the same time generates a corresponding revocation key.

In connection with the electronic signing and encrypting messages is necessary to ensure regular monitoring of the if not to invalidate any of the keys or certificates that we have stored in your client (public key people with whom we have e - mail contact). CAs that issue certificates, usually an appropriate form revoked, publish a list of certificates (for example, through their website or e-mail. Mail). These lists should be in the user's system regularly updated.

The care and attention

Users should always be careful on things like locking your computer when you leave your desk (even short) and closing applications such as mail client before leaving work. Also, for example in internet cafes, generally any computer on which you are a guest, you should turn off at the end of the running application. It should also be cautious when sharing a transmission medium such as with media exchanged with a colleague. In general, should always be applied the principle of "trust, but verify"

Transmission media

Users should keep in mind that regular antivirus protection to their station is needed, but is not a universal solution. If you use an external media, such as when transporting data between home and office PC, it is necessary to pay regular (virus) care to these media.

Archiving and encryption of sensitive data

If the results of our work data, which are not intended for everyone and the disclosure of which could cause problems, you should encrypt the data before storing

and have them archived only in encrypted form. The encryption can be used such as the already mentioned PGP keys or certificates. A good choice to increase the security of data is of course encrypted file system.

Knowledge of the functionality used tools and OS

Great pains current technology is the fact that along with increasing their user-friendliness reduces the user's awareness of how the application works and what their behavior can cause. Too late then wonders how it is possible that their „private“ e-mail can be read by someone other than the addressee, the data that are personally deleted, the hard disk of the machine to find long after you have done so, they are guilty of copyright infringement that their e -mail address goes large amount of spam that have infected your computer and the like. It is therefore useful to know the following rules and abide by them:

 Do not apparently useful function to remember the password for future use, offered as www - browser or email client. Thus, although the user will be added a little extra work, but the safety is worth.

 For deleting files using sophisticated methods to ensure actual physical deletion of the data itself, not just about them. A good solution would be to use an encrypted file system or encrypt sensitive files.

 To secure electronic communication using encryption of messages, such as using a personal X.509 certificate or PGP keys. To protect the identity of electronic message sign.

 Do not open suspicious e - mails and especially not their attachments. The obvious spam fundamentally responding and not to seek exclusion of evidence, even if this

letter has to offer. If you do so, just to confirm its functionality addresses a support of its inclusion in the spam addresses.

 When using client data sharing can occur when the wrong configuration to the fact that at the time of downloading the data automatically offers to download other users ; the user is often unaware and relies on the fact that when downloading data protected by copyright law solely for personal use and is not going to distribute them, so nothing wrong with not commit. He does not know that his client automatically exposes this data at the time of tightening phase.

 The most important services and tools exist secure their release. For example, for e- mail protocols are IMAPS, POPS and SMTPS for access to remote servers, data transfer protocols SSH and SCP.

 Install programs coming only from reliable sources! Unless sure the user should install new things left to administrators.

Psychological pressure

Each user should be aware of the possibilities of psychological pressure, which can become victims as well as on itself. He should know that no one - associate, manager, or supervisor - is allowed to him under any pretext ask for the password that and that such a request is illegal, suspicious, and should not be left unchallenged. The administrator of the machine user password has no need because he has other means to. In the system to get to where in connection with his role as an administrator needs. Supervisor again has a formal procedure that can be applied in accordance with the rules of the company. No one is entitled to a colleague told him the password to your account the key and the like. It is always advisable to note parallels from everyday life - a neighbor or boss also do not teach your signature according to the bank signature card.

The opportunities and risks of psychological pressure should be informed especially beginning students and new employees.

This category also includes alarm e - mails like „hurry the change password the 'zbcdef ', otherwise the abuse of your account. „to abuse actually occurs when such a call is obeyed.

Basic knowledge of rights, obligations and risks

User can get into serious trouble even seemingly innocent activities just because it does not know the basic rights and obligations. A typical example is a copyright infringement exposure of copyrighted data (movie, music, software) on the web - site or through a client that provides data publicly for download. This act commits an illegal distribution of data protected by copyright law and may lead to response to the disabled and requests for financial compensation. Sometimes users think that they are in the field of copyright nothing can happen, because „What I can do business from the U.S.? Into the Czech Republic did not reach me“ It is a mistaken idea ; most countries, including the Czech Republic has laws that affect the illegal distribution of

copyrighted and everyone (even people from abroad) through the misuse of their data can defend.

Another relatively frequent offense, which users make is spamming (spamming). For example, sending out promotional information to large number of recipients a user commits not only offense against decency and netiquette, but in some cases also in violation of applicable laws.

Great pain is careless handling of private information and data. In recent years, it is very popular so-called phishing, which brings the user to themselves betrayed your access code for bank accounts or other services. The principle is very simple: the user receives alarming news that his bank account was at risk of abuse, which can lead to loss of finances. But that this can be prevented by changes instantly when an access code - via the link. The problem is, however, that the link does not lead to sites mentioned banks (even when that face), but the attacker's site, where the user is asked to fill important data. If they do take, his fate is sealed.

This field is really about the best recommendation cool head, common sense and use the analogy of non-internet life. The unknown stranger, who would argue that your account will be abused for five minutes, but he can save you when you give him his papers and learn it your signature, also probably will not believe this, but go to inquire into their bank.

Cooperation of administrator and users

A very important point in the security field is communication between the user and the trustee. The user should know that there is a manager there to help him to the maximum extent, especially in case of problems in the field of security. Users often ashamed to admit that he probably did something that may lead to a security breach (eg, compromise of passwords), and this fact hide - whether out of fear of the administrator, superiors or concerns about their personal prestige. However, this is fundamentally wrong. Timely and appropriate intervention, an administrator can still save many. The longer the user with a warning to his mistake hesitates, the worse the situation may prove to be. It is also good to remember that even the manager is a person and not omniscient. Therefore, if the user holds the suspicion that something with his computer or with a particular service

OK, managers should always communicate their suspicions, even if it ultimately proved wrong.

The consequences of a breach of security of computer / network

Users often think that the security of their data, computers and networks themselves are generally not affected. Especially in the case where only "passive“ user and on the computer that use in their work, the old „manager ". They feel that the administrator is responsible for everything and in case of security they can not stand no harm and may be responsible for anything. This is of course a mistaken idea - and passive user can breach the security of your computer actively participate. For example, by a colleague „lend „to use your computer or your password, use the infected transmission medium or simply their naivety and ignorance (copyright

infringement, spamming). Another misconception is that some users calculate in advance, is that in the event of a security breach can not figure out exactly how it occurred and who is responsible for the problem. Most experienced managers but is able to detect these things. Significant help in the search for weak spot under the system of, for example systems to recover deleted data or central log- servers, which record important operations (such as logging into the system, changing data, etc.). The users of these technologies would need to know (as well as the fact that the controller is inquisitive and security incidents when they occur, is taken as an opportunity to learn something new), because it increases their sense of responsibility. Once they learn that the world of computers nothing disappears forever, their approach to change in favor of safety. It is advisable to inform the user about the possible consequences of a security breach. These can be very serious - often misuse the user's identity and personal data, for example to gain access to private data or to deceive others.

All this may lead to invasion of privacy, loss of personal prestige, goodwill, finance, problems in the family and life together, problems at work and subsequently lost, the exclusion from school.

The general recipe to achieve 100 % security does not exist about what to say because in the end? Probably the most concise pioneer „Be Prepared“ and if a security breach occurs, respond quickly and effectively to efforts to eliminate the problem with the least possible consequences. Also, the key to computer security

and application of the end user. Time spent on his education is definitely worth - or "learn, learn, learn... ".

Second secure data protection - assets and threats

If you have a computer trade secrets, sensitive data, financial data, contact lists and other things that you do not want to see anyone else, then we need to provide access to the operating system as well as data.

Computer security is often discussed topic. Avoid tracking activities and input into the computer is then the basis. You do not necessarily suffer from paranoia, to want to secure access to sensitive data.

This can be achieved by several different methods with different software helpers. The simplest and most basic approach is to provide computer password directly in the BIOS. A simple and elegant way, but does not address the situation where the disk is physically removed and connected to a different address.

A more efficient way is to directly encrypt your entire hard disk so that the data will be inaccessible without a password even in other computers. It is also possible to lock only the operating system and access to it. This is the case where a shorter period of time you leave your computer a major offensive in the form of dismantling should not be afraid.

2. ASSETS AND THREATS

The analysis must perform the risk assessment of assets, threats and vulnerabilities. It should be possible in the risk analysis an evaluation of the assets, threats and vulnerability six different ways. If the assets referred to as A (assets), threats such as T (threat) and vulnerability as V (vulnerability), it could be factors evaluated in this order: ATV, AVT, TVA, TAV, VTA, VAT, while TAV and VAT is probably the least likely approach to the assessment of these risk factors. It usually begins with an assessment of assets, and then continuing assessment of threats and vulnerabilities.

But it is possible to start both ways ie firstly identify threats and vulnerabilities and determine on the basis of probability (likelihood) abuse the vulnerability threat and then move on to determining the value of impact (impact). Finally, it is possible to start and assessment of vulnerabilities and continue the search for threats that could exploit these vulnerabilities and evaluation of assets or quit. determining the value of impact.

Probability threats can be unintentional threats case estimate based on historical data, but in the case of advanced persistent threats (Advanced Persistent Threat shortcuts APT) is necessary to evaluate the factors such as the size, relevance, familiarity and popularity of the organization, it is clear that there will always be someone who will have a motive, opportunity and ability to carry out the threat.

This brings us to the fact that the probability of threats in some cases largely dependent on the value of the asset. It is obvious that what the organization is more important or has any influence in society, the more attractive it is for an attacker to target.

Is not always easy to look at the threat and vulnerability as two independent factors at each other, especially when the threat becomes more likely,

The easier it is possible to exploit a vulnerability. Therefore, we often encounter in risk assessment only two factors and likelihood (L) and impact (I), which enter into the calculation of risk (R). Taking likelihood already includes both the probability threats, and also the degree of vulnerability.

Needless to say, the risk in this case is given by $R = L \times I$.

Conclusion: Whether you choose to evaluate the different factors in any order, and you will soon discover that it is not always possible to keep this procedure. Risk analysis and must perforce be described as iterative, and not entirely linear process as many times you need to also go back and re-evaluate some factors.

Remote access is practically used in two typical situations, which, along with instructions on how to proceed.

The case where his own devices - usually a laptop - connect to a foreign network. Practically you can trust the computer, but the network to which it is connected. Typically, this access from home, conference, hotel networks, etc.

What have prepared in advance?

Maintain computer is properly protected.

Install VPN client.

Check your knowledge and force your password.

Be activated remotely change the password.

How to proceed?

Start the VPN.

Proceed to the requested service.

After running the VPN can act as your office at the university,

ie access all services without discrimination.

Remote access from an external PC

The case when you do not have your own laptop and still need to use some

of services UO. If you attend conferences, training, etc., are usually prepared for the participants publicly accessible station with connection to the internet. In general, the available computers in Internet cafes. This means that using a computer, which you can not believe, and this is connected to the network, which also can not be trusted.

What have prepared in advance?

Check your knowledge and force your password.

Be activated remotely change the password.

How to proceed?

Proceed only to necessary services.

After returning to a safe environment, change the access data (password).

Given that in this case we can not guarantee secure transmission of access data, respectively. all the transmitted data, it is not recommended to use the services of critical importance.

The subsequent password change - whether by phone or in another safe way

- It is absolutely necessary.

Behave safely

Well select your user password and keep it secret.

Use only secure communication protocols (SSH, HTTPS) whenever you are sending your password over the network.

Be careful to not become a victim of phishing (fishing)

Observe for the security of IP phones, if you use them.

Properly use the electronic signature and PKI

Follow the basic recommendations for remote access if you are on the go.

What to do in case of a problem?

Learn how to handle security incidents...

3. SECURITY ANALYSIS OF A SYSTEM

The safety analysis - risk should answer the question what effect the threats the company is exposed, how much are her assets against these threats, vulnerabilities, how high is the probability that a threat exploits a vulnerability and what impact it could have on society.

In risk analysis, the following basic concepts:

asset (asset) - everything has some value to society and should be adequately protected,

threat (threat) - any event that may cause disruption to the confidentiality, integrity

and availability of assets

vulnerability (vulnerability) - property assets or weakness at the physical, logical or administrative security, which can be exploited by a threat

risk - the probability that a threat exploits a vulnerability causes disruption of confidentiality, integrity or availability,

action (countermeasure) - measures the level of physical or logical administrative security that reduces vulnerability and asset protection before the threat.

In addition, we can still meet the following concepts that are no longer so common, however, it is advisable to know about them:

exposure (exposure) - the fact that there is a vulnerability that can be exploited by a threat

violation (Breach) - a situation where there was a violation of confidentiality, integrity or availability due overcome security measures.

CONCLUSIONS

The first point I want to draw attention to the fact that quite often the identification of the concept of risk and threat.

The second is important to note, however, that the threat may be the source of one or more of these risks and the threat itself does not constitute a risk.

Threats third only misuse vulnerability leading to the compromise, which is the risk that can be reduced through measures to protect assets from the effects of these threats.

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The tasks for independent work:

1. Put into practice basic information how to secure data access on a PC
2. Clarify the meaning of the data protection - Assets and threats
3. Characterize the security analysis PC- penetration into the system

Chapter K: Computer security

1. SECURE DATA ACCESS - SOLUTION

Malware is a computer program designed to intrusion or damage a computer system.

Malware stands for "Malicious Software". It is a term that is generally used for the program without user consent settles in the system, and which was designed to infiltrate or damage your system.

Given how often the Internet searching foreign information sources using a browser web pages and further focus just on them.

Many users preferred to MS Internet Explorer that Microsoft products as is usually compromised Firefox. But even here there is no 100 % security.

Sometimes it may be a problem with Firefox result of malware activities, whose presence in the system, the user does not even know. So also describes what are the usual symptoms of the presence of malware in the system and how to get rid of it.

Different malware to exhibit different symptoms:

 We are constantly display pop-up windows with advertisement, even if you set the pop-up blocker. You can set the pop-up blocker.

 Your searches are redirected to another page to one of your computers to retrieve their content, and you are not allowed to block the page.

 Your homepage has been changed and can revert to the original.

 Firefox never finishes loading a page or a page does not load at all.

 Firefox frequently freezes or falls.

 Firefox will not start.

 there are problems with connecting to Facebook.

 Firefox constantly opening many tabs or windows.

 were installed unwanted toolbars.

How to protect yourself from malware?

In order to get malware into your computer, it is good to follow a few simple principles:

Regularly update your operating system and all the software:

Malicious software to its penetration into the system usually uses known vulnerabilities of others programs, which can be corrected in later versions. Make sure you are using the latest versions of all components of the program, including plug-ins, which you can check on our site inspections plugins. Actuality of Windows will investigate using Windows Update.

Do not install untrusted software:

Some websites offer programs to increase the speed of the browser, for ease on the Internet, to add toolbars that are doing things that Firefox has done. Some unwanted programs are also bundled with software packages. Typically, these programs collect information about your behavior on the site and is only for people who created them and who Firefox abuse. Make sure that you install Firefox from Mozilla and when you install the software, not the wizard installation to be installed and unwanted programs.

Many malicious websites trying to get malware into your system so that contain images that look as if they were pop-ups, or shown, as this page scans your computer. More information about the detection of false popups, read the article popup blocker.

Keep active anti-virus and anti -spyware program and regularly run system scans:

Make sure your security programs in the control is activated in real time. Perform full system scan at least once a month.

Do not run a fake Firefox:

Firefox download page from mozilla.org / firefox.

How do I get rid of malware?

If your antivirus or anti -spyware program malware not detected, have the system checked following non-commercial programs to detect malware. You should try all programs because each program is aimed to detect different type of malware. Also make sure that the database of these programs are up to date.

Warning: Antivirus and anti -spyware programs can sometimes produce false positives. Consider, therefore, whether suspicious files instead of deleting prefer to be safe put it in Quarantine.

Note: Certain parts malware can be removed only in Windows Safe Mode only.

2. SECURITY ANALYSIS

First update the operating system and other programs.

In fact, there are several main types of software updates. The user devices, including your PC and, most often we meet with four of them:

• Functional Review (eg antivirus database)

• Security update (the patch) and updates that resolve malfunctions

• Cumulative update that partially elevate generation software (service packs)

• Installation of new generation software update mechanisms

Most software updates, with whom we meet every day, so the user does not actually anything new. It is a functional update of protective mechanisms (antivirus, firewall) security updates and software (operating system, installed programs).

Their purpose is to eliminate potential faults in the software so that they could not be used for the attack. A protective software to prepare current threats coming from the network.

2. update and install an antivirus program

With the evolving threat landscape is evolving and technology against threats. Security experts constantly working to be ahead of the new types of attacks and were able to respond. As soon as the new method of attack, not long before the company finds a way to identify, prevent its spread and to remedy its consequences. But the development of new technologies and strategies of response is only half the solution.

The latest technology and information must travel the path from research labs to your desktop. Here come into play update programs and Internet.

For example, Norton AntiVirus and LiveUpdate uses your computer supplies new virus definitions and program review. This is an important step in protecting against the latest viral variants.

Meanwhile, Norton Internet Security uses LiveUpdate to get the latest spam definitions and updates Web filter. The current definition of spam to help thwart unsolicited advertising and Updates Web filter to help prevent children encountered the newly published web pages with inappropriate content.

Configure the system to notify you of the availability of critical updates, and also set the automatic start of pre -defined schedule.

Third checked regularly (SCAN) DATA COMPUTER

Not only in terms of updating antivirus software and resources, but also from the legalization of software is necessary in companies implement software audit.

SW audit, is the primary tool for software management, which is responsible for the management of software and licensing policy.

SW audit is a sequence of steps that lead to the identification of existing software licenses purchased and comparison of these states on the basis of invoices. Its main objective is to legalize all software companies to maximize efficiency when buying software and minimizing losses resulting from the ownership and use of the software.

Achieving these goals is part of a long-term concept, resulting in large savings to transfer responsibility to the individual users.

SW audit provides a comprehensive overview on the use of software across the company. This means that you get an overview of what software (legal and illegal) in which computer is installed, its usability or vice versa ineffectiveness (redundancy, duplication).

SW audit also examines the possibility of buying a more efficient form of software volume licensing and substantial cost savings for the purchase of software.

4. install a firewall

Set rules for communication across firewall is commonly described as a „firewall security policy ", abbreviated as „security policy ". Security policy includes not only the rules of communication between networks, but the majority of today's products also various global settings, address translation (NAT), instructions for creating an encrypted link between encryption gateways (VPN - Virtual Private Networks), searching for possible attacks and protocol anomalies (IDS - Intrusion Detection Systems), authentication and authorization of users sometimes and manage bandwidth (bandwidth management).

5. back up your data

Corporate data and information are often the most valuable asset, enabling business works, earns lives. Is it something with considerable effort, build, create, often for years. All our work may be thwarted in one second. This is something most of us are aware, but they are not trying to prevent the risk of loss, as controls us comfortable and pleasant inner feeling that we are nothing like that can happen.

Backs up so that we can restore our data if you lose them.

Data can be lost in basically three reasons:

• Failure of technical devices - hard disk, disk controllers or other components or entire server

• Deletion or corruption of data - whether intentional (or any other user „attacker "), which is the aim of causing damage to the data owner, or unwanted when the deletion or corruption of data in error due to carelessness or ignorance

• Higher, respectively. external power - the data in this case, we can come in case of theft or natural disaster (fire, flood...)

Do not open attachments suspicious e - mails. Suspicious are mainly e - mails containing attachments that you did not want to sender. Particularly careful you give when you differently from Czech -writing friend, colleague or business partner arrives English-language report.

If it mention to open the attached document, never do it. Exactly this method of spreading is used viruses derived from the famous Melissa. Always sender send e - mail asking why you send documents that you did not ask him. If you will say that you

did not send anything, encourage him control the computer checked and ask him to resolve the situation kept in e-mail client.

If it is connected to the Internet. Do not believe e - mails in which the sender can claim that the attached document is a useful application that can do a lot of things. The relevant e - mail without hesitation delete.

7. Secure data encryption

Securing data with encryption should therefore be the first step to securing your site. Encryption can be done in two ways - either with one shared encryption key or two keys, one of which is public and one secret (private). If we encrypt data with one single key, you have a key to the other side safely replaced. Anyone would have won this key, easy read our communication. This principle is clearly impractical to encrypt the data on the server, because we had all our visitors to send an encryption key in advance. Significantly better way is to publish its public key, which the visitor can encrypt data. Read our data can only server that has the private key to decrypt it. This principle of public key certificates used by SSL. Encrypting data ensures SSL certificate that the server operator shall ensure that the certificate authority. SSL certificate is, as already mentioned, the server's public key. The authenticity of the certificate can be verified by the issuing certification authority that signed the certificate at issue. User certificates can u superior authority to verify that the signature is valid, and therefore that the public key in the certificate comes from a person that the certificate states in its detail.

Web page code and files should be regularly checked for malware, because attackers often placed on a trusted site malicious code. Surely you've also noticed a trend DDoS attacks on websites that are multiplying. The attack on your web today can provide anyone, and it is therefore advisable to monitor the connection to your server. Current software is also important for the security of your server, because attackers focus on known bug in the software. Installed patches reduces the risk of attack server via a known vulnerability.

3. LEGISLATIVE MEASURES

For reassurance Internet users are laws that govern the rate at which data can be handled. The first legal anchoring of privacy, which is a significant shift in the security sphere, appeared in 1992. Here, most of them with the knowledge that constantly appear amendment of the requirements of practice.

Act No. 256/1992 Coll.

The law on the protection of personal data in information systems came first with the need to address the rights and responsibilities of information systems and the style of management of personal information included in them. This law is the first showing from the field of science and for the first time set rules for working with information.

Directive 95/46/EC

Directive of the European Parliament and of the Council of the European Union Directive 95/46/EC of 24 October 1995 on the protection of individuals with regard to the processing of personal data and the free movement of such data is one of the key documents that deal with the protection and processing of personal data.

Act No. 101/2000 Coll.

Act No. 101/2000 Coll., On Personal Data Protection went into effect on 4 April 2000. Law 's objective is to control the handling and processing of personal data of citizens of the Czech Republic. This law is based on insufficiently defined by Act No. 256/1992 Coll. and modifies it in a concise and useful form, removing inconsistencies contained therein and in particular it adds the missing essentials.

The law 101/2000 Sb. based Office for Personal Data Protection.

The Office for Personal Data Protection

The Office for Personal Data Protection was established by § 2 of Act No. 101/2000 Coll. "The purpose of the Act on Personal Data Protection Charter of Rights and Freedoms guaranteed right to protect citizens against unlawful interference with his privacy

and personal life, and unauthorized collection, disclosure, or other misuse of personal data. At present, the company is due to the development of information technology, this right is increasingly undermined. "

Change: 227/2000 Coll. 177/2001 Coll. 450/2001 Coll. 107/2002 Coll. 310/2002 Coll. 517/2002 Coll. 439/2004 Coll. 480/2004 Coll. 439/2004 Sb. (part), 626/2004 Coll. 413/2005 Coll. 444/2005 Coll. 342/2006 Coll., 109/2006 Sb. 170/ 2007 Coll., 52/2009 Coll., 41 /2009., 227/2009 Coll. 281/2009 Coll. 468/2011 Coll. 375/2011 Coll.

In addition, include: 227/2000 Coll., Act of 29 6th 2000 on electronic signature and amending some other Acts (the Electronic Signature Act)...

The amendment to the Act on Electronic Signatures (No. 167/2012 Coll.)

The purpose of the Electronic Signatures Act is to enable the use of digital signature

within the electronic communications equivalent of a handwritten signature in the common written form of communication. The law was created by the European Directive 1999/93/EC of 13 12th 1999.

It should be recalled:

 It is therefore important to encourage every citizen of the Czech Republic, while Internet users to sufficiently aware of their rights and options and be aware of all the traps that in this global network environment may occur. It should therefore lead to purposeful training of all Internet users of all ages.

 It is also important to understand the obligations and adhere to written recommendations and ethical behavior in such a dynamically developing network of networks - the Internet.

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The tasks for independent work:

1. Provide students with basic information about safe access to the data.
2. Illustrate the importance of analyzing the second data security, diversity of manifestations of malware.
3. Characterize the diversity of legislative legal restrictions.

Chapter L: Data storage, remote access

1. METHODS OF ACCESSING FREELY AVAILABLE DATA

Internet as a global network used to communicate a variety of tools (hardware and software) that allow us access to data and services, which are in terms of location anywhere in the world. Data are transmitted through various channels, which has access to a lot of people and therefore there is a great risk of misuse your data to someone else, or viruses infecting your PC. Always we have to think about what services we use and what to us may have risks.

The HTTP protocol

HTTP (Hypertext Transfer Protocol) is an Internet protocol for exchange hypertext documents in HTML format. Usually uses port TCP/80, version 1.1 protocol is defined in RFC 2616. This report, along with e-mail the most widely used and contributed to the tremendous growth of the Internet in recent years.

Is currently used for transmitting additional information. Using the extension MIME can transfer any file (like e - mail) is used together with the format for the XML Web service (running remote applications) and using application gateways provides access to other protocols, such as FTP or SMTP.

HTTP is used as some other applications called uniform resource locator (URL, Uniform Resource Locator) that specifies a unique location of a resource on the Internet. The actual HTTP protocol does not support encryption or security data integrity. To secure HTTP is often used TLS connections over TCP. This use is known as HTTPS.

Activity log

The protocol operates like a question -and-answer. User (using, typically a web browser) queries the server in clear text, highlight the desired document containing information about the capabilities of the browser, etc. The server then responds with a few lines of text describing the query result (whether the document was able to track what type of document, etc..), followed by the actual data of the requested document.

If the user will have after a while another query on the same server (eg because the user clicked on the document hyperlink) will be an additional, independent inquiry and response. From the perspective of the server can not tell if this second question in any way related to the previous one. Because of this, the HTTP protocol says no state protocol - the protocol can not keep the communication status, queries are not linked together. This feature is awkward to implement complex processes via HTTP (eg online store needs to keep customer identity information, the contents of its "shopping cart ", etc.). To this end, the protocol was extended to the HTTP, HTTP

cookies, which enables the server to store information on the connection status on the user's computer.

HTTPS (Hypertext Transfer Protocol Secure)

In computer science HTTPS is an extension of HTTP network protocol that transmits all data over the network unsecured and there is a possibility of abuse of this sensitive data. HTTPS allows secure connection between the Web browser and the Web server from eavesdropping, spoofing of data and also allows you to verify the identity of the counterparty. HTTPS uses HTTP protocol, the transmitted data is encrypted using SSL or TLS and standard port on the server side is 443

Foundation for today's HTTPS form dates back to the nineties of the last century. At that time, the company Netscape Communications came up with the first version of the SSL protocol, which created for your Web browser. This protocol enabled the application protocols possibility of transmission of encrypted information and verification of identity.

Principle of operation

The HTTPS protocol uses asymmetric encryption. Both parties prior to the commencement communications generated key pair (private and public). When initiating communication exchange public keys that both sides should verify through another communication channel. Verification can be checked lift (print miniature hash) public key counterparty, for example, using the phone or you can use the principle of the transfer of trust when we counterparties in advance of public key digitally signed (preferably a CA that is trusted and whose public key we a trusted repository, such as Thawte VeriSign, RapidSSL, GeoTrust, etc.). Digital certificates are the cornerstone of security provided by SSL / TLS.

While the actual encryption to protect communications from eavesdroppers, without verifying the authenticity of public keys communicating parties are at risk of attack Man in the middle. For certificates issued by certification authorities that have their public key in the store that comes with a web browser is required to pay. However, there is the possibility of creating a certificate that the publisher himself signs (English self -signed certificate), but in this case, the counterparty must add the repository public key itself (and check him otherwise).

Integration in browsers

If you are connecting to a network that has an invalid certificate, older browsers warn users using a dialog box, asking the user if he wants to continue the transition to a network. Newer browsers display a warning across the window and also displays information about the Web server using the address bar. This information will then consist of data about the name of the certificate, the certification authority, which the site uses a secure protocol and what is its version.

Most browsers use the address bar to inform users of the secure connection. It uses the address bar to inform the user about the connection security warning when you try to enter the non-secure Web page.

Using HTTPS

Security with SSL you need when:

• you e -shop or offer or accept online orders and credit cards

• If you are running with high importance (banks, offices, government)

• offering input into your own network and you want communication was securely

• working with sensitive data, such as addresses, social security numbers, license, you must follow the privacy, etc.

VPN

VPN networks are typically formed between the computers that are connected to the Internet.

Example, you can secure connection to corporate laptop connected anywhere

Internet to the corporate intranet (internal company networks). To connect to the corporate network, first make operational the VPN server, provides a connection to the Internet, which

are then connected VPN clients from anywhere, which is also connected to the Internet. VPN server acts as the gateway that provides connectivity ensures security and encryption of all communication.

Generalization is a VPN tunneling network when using a standard network connection creates a virtual link between two computers within which it is possible to establish additional network connections.

This system assumes that the user has connected to the VPN concentrator, and it is who they claim to be. Furthermore, it is expected that the target firewall protects the network that allows access only to certain VPN gateways.

Therefore, to get somewhere user must have established connection to the home network.

The procedure is as shown: The user attempts to connect to the network but blocks

it firewall (1). Therefore, the user must establish a connection to the VPN concentrator home (2), which verifies the credibility of his home network (3), and if the user is known, the firewall sends the request for a permit communication (4). Then, nothing impedes connection to the desired destination network (5).

Linking, in which the private data is encapsulated and encrypted is known as a VPN connection.

There are two types of VPN connections:

• Connect VPN for remote access

• Connecting a VPN between networks

Connect VPN for remote access

Connect VPN for remote access allow users who work at home or on the road, working with a server on a private network using a public network infrastructure, such as the Internet. From the user's perspective can be seen as a VPN connection between two points, between the computer (the VPN client) and server organization. The exact infrastructure of the shared or public network is irrelevant because it appears logically as if the data was sent over a dedicated private link.

VPN connection between networks

VPN connection between networks (also known as a VPN connection between the router) allows organizations to route connections between separated workplace or other organizations over a public network while maintaining secure communications. VPN connections routed through the Internet logically operates as a dedicated wide area network WAN link. When networking via the Internet, as shown in the following figure, the router forwards packets to another router via a VPN connection.

Connecting a VPN between two networks connecting a private network. The VPN server provides a routed connection to the network in which the VPN server is located. The calling router (VPN client) is verified against the corresponding router (the VPN server), and because mutual authentication with the appropriate router to verify the calling router. Packets that are sent from either router across the VPN connection, VPN connections between the networks usually do not come from these routers.

VPN connections that use PPTP, L2TP, L2TP/IPsec and SSTP, have the following characteristics:

• Encapsulation

• Authentication

• Data Encryption

Data Encryption

For data privacy during transmission to the shared or public transit networks are data encrypted by the sender and decrypted at the receiving end. Encryption and decryption is based on the fact that both the sender and recipient use a common encryption key. Captured packets sent over the VPN connection in the transit network are incomprehensible to anyone who does not have the common encryption key. The length of the encryption key is an important parameter security. The

encryption key can be detected using computational methods. However, the longer the encryption key, the more computing power and longer computing time is needed. For reliable data confidentiality is therefore important to use the longest encryption key.

2. SECURE REMOTE ACCESS TO DATA

Ever since the beginnings of the Internet increasing need a secure communications. Communication on the Internet using the HTTP protocol is purely text, so any data that is not protected, can then be tapped and misused.

Company Comunication Netscape developed the first security protocol SSL 1.0. The development of this security protocol went fairly quickly, because just five months after the release of the first version of the SSL protocol was released the second version of SSL 2.0. In late 1994, the Netscape browser also become the first to support the security protocol SSL 2.0. Along with the development of SSL in the development of secure communication also dealt with other companies. After the release of the second version of SSL could not Microsoft just so lightly regarded the conduct Nescapu and so was the development and subsequent launch of a new kind of security protocol called as Private Comunication Technology (PCT). This new protocol was slightly better than SSL 2.0 and actually some protocol properties PCT have been used for SSL 3.0.

Over time, the far more successful SSL. The creation of Netscape became a kind of standard for reliable communication on the Internet. Development of SSL was not some Nescapu closed now, but was also open to other developer companies, which are also involved in its creation. In 1996, organizations dealing with standards and standardization in the world of internet and computers Internet Engineering Task Force (author of the standard protocols TCP and IP) renamed the SSL security protocol TLS (Transport Layer Security).

Under this new name began further development of security protocol. Virtually TLS 1.0 is only minor differences consistent with SSL 3.0. Many web servers support SSL protocol. This is due to its popularity, especially in its simple application on the server. To the server to use SSL, you must possess a certificate from a trusted authority. These authorities are trusted by companies such as AT & T Certifikates Services, GTE Cyber Trust, International KeyWitness or Microsoft.

TLS and SSL

Protocol (s) TLS allow applications to communicate over the network in a way that prevents eavesdropping or tampering of messages. TLS Using Cryptography provides its endpoints authentication and privacy in Internet communications. Typically, only the server is authenticated (ie its identity is ensured) while the client remains unauthenticated. This means that the end user (either a person or an application such as a Web browser) can be sure with whom it communicates. An additional level of security - in which both ends of the „conversation „are sure with whom they communicate - is known as mutual authentication. Mutual authentication requires the implementation of public key infrastructure (PKI) for clients.

TLS includes three basic stages:

• agreement of the participants in the supported algorithms

• key exchange based on public-key encryption and authentication based on certificates

• encrypt a symmetric cipher

How it works

The TLS protocol is based on the exchange of records. Each record can optionally be compressed, it can still be connected authentication code (message authentication code, MAC) and can be encrypted. Each record is assigned a content type, which determines the higher level protocols.

Certificate

A digital certificate is digitally signed by asymmetric cryptography public encryption key that is issued by a certificate authority. Stores in X.509 format, which (among other things) contains information about the owner of the public key and the certificate issuer (the creators of the digital signature, that certification authority). Certificates are used to identify the counterparty in creating a secure connection (HTTPS, VPN, etc..). Based on the principle of the transfer of trust can trust an unknown certificates that are signed by a trusted certificate authority.

Contents of certificate

Data are described in the certificate ASN.1. Benefits of ASN.1 consist of computer platform independence and good readability for humans. The transfer of keys used form of binary DER or PEM format text or CER (using Base64 encoding), or even PKCS # 7/P7B or PKCS # 12/PFX. Among the different formats is possible to transfer using a suitable tool. The certificates are the following items:

• Serial Number - (certificates have to better identify its own serial number, but it is not necessity)

• Subject - the identification of the owner of the certificate

• Signature Algorithm - the algorithm used to create the signature

• Issuer - the identification of the certificate issuer

• Valid - From - date of validity of the certificate

• Valid - To - the expiration date of the certificate; the most common period of validity is one year

• Key -Usage - The purpose of the public key (encryption, authentication, signatures, or both)

The client may or may not respect the purpose of setting (eg, Windows XP this item when authentication against RADIUS server ignores, but Windows Vista and later require setting purpose TLS Web Server Authentication).

• Public Key - the bit length is dependent on the type of encryption

• Thumbprint - custom certificate fingerprint used to verify the integrity of the certificate

To create a digital signature in the digital certificate used algorithms are RSA, DSA and ElGamal.

Classes of certificates

VeriSign Company has defined several classes of certificates:

• Class 1 - designed for individuals to e - mail

• Class 2 - for organizations which require proof of identity

• Class 3 - intended for servers and digital signatures, where the need for independent confirmation of the identity certificate authority

• Class 4 - designed for on- line transactions between companies

• Class 5 - intended for private parties or government security

Creates a digital certificate certification authority. First, verify the information submitted by the owner of the public key encryption, complete identification data and all subsequent electronic signs.

3. DATA STORAGE AND PROTECTION

Data Storage (NAS)

NAS (Network Attached Storage - "data storage on the network ") is the science term for data storage connected to the LAN. Data storage that can be provided by various users. NAS may only have the function of a file server, but may also have other specialized functions. For instance client P2P networks, web server, and more. Usually contains an embedded computer that has the task of sharing data and support a variety of protocols. NAS contains one or more hard drives that can merge into larger data structures, or they can create a RAID array. Cheaper devices support mainly RAID 0 and 1 Data access is usually via NFS, SMB / CIFS or AFP.

If you need somewhere to store files (pictures, videos, specifications, documents, data demand, drawings, etc.) and you wanted to summon multiple recipients at once, with information on their storage so that the recipient can within a certain time period alone download (pick up), use data sharing services on the Internet. Getting to them can not only computers running Windows, Linux, Mac OS, but also from mobile devices such as smartphones or tablets. They offer a number of GB free. If

necessary, more capacity you can buy it, or some of them give out more space on the fulfillment of certain conditions or recommendations for new users. Some storage is used only for backup, the other will automatically take care of the synchronization between the PC.

Data storage on the Internet accessible via SW

Internet not only offer storage space for your data, but also the function to work with them. I can manage it via a mobile device. Some examples of storage that will be available on the installation of software on your PC. SW will also ensures the security of communication when working with your data.

Google Drive - freeware

Storage from Google offers a free place for 5 gigabytes of data. Within the service can work with documents, without the need to store them locally. Thanks to the client, it is possible to perform automatic data synchronization (Google Disk folder). OCR function is useful, therefore, recognize the text in the image. Provided free capacity is 5 gigabytes

Microsoft SkyDrive - freeware

Microsoft in the cloud (remote servers) offers free 7 GB of space. The service synchronizes data and documents can be edited on- line in Microsoft Office directly on the site. As part of the track versions of documents, on- line photo slideshow or view geo marks. Maximum single file size is 2 GB. Provided free capacity is 7 gigabytes

Data storage on the Internet accessible via HTML

Ulozto.cz

(http://ulozto.cz/) Totally Free offers a capacity of up to 800 megabytes without registration. But if you sign up, you get an overview of all your uploaded files. The protection of stored data.

And many more...

On the Internet services are offered and data space for storing and sharing data (data storage) for individuals, teams, and large companies. Services are provided either free or charged, there are limitations especially in the amount of stored data. It depends on which service you specifically select based on our needs - see eg www.capsa.cz.

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The tasks for independent work:

1. Provide students with basic information about the methods of access to freely available data.
2. Clarify the meaning of the securing remote data access.
3. Characterize the data storage and protection.