Praktinė Informatika

Practical Informatics

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Matematikos ir Informatikos fakultetas

Kompiuterijos katedra

Vilniaus Universitetas

Praktinė Informatika

Praktinė informatika apima bazines žinias, kurių reikia studentams dirbant su kompiuteriu:

- ergonominiai principai,
- operacinės sistemos ir jų teikiamas vartotojo interfeisas,
- įvairios paskirties programos ar kalbos (**Word, Excel, PowerPoint, Access, Latex, Html, Matlab, Maple, Delphi, Java**)

Šis kursas turi išmokyti studentus:

- įsisavinti kompiuterinę terminologiją,
- rengti sudėtingesnio turinio dokumentus,
- naudoti kompiuterį pvz. "matematinės analizės" kurse, skaičiuoti kompiuteriu įvairiarūšes (išreikštines) formules, analizuoti jas, vizualizuoti jų grafikus, paviršius,
- kurti Interneto tinklapius,
- rengti leidybai tinkamus kokybiškus tekstus ir tekstus su formulėmis,
- rengti įvairias lenteles, manipuliuoti su jomis, organizuoti duomenis jose, atlikti paieškos operacijas.

Kursas apima:

- teorines paskaitas,
- praktines užduotis arba projektus (vykdomus ar aptariamus pratybų metu)

Atsiskaitymo forma: įskaita (įskaita pasirašoma, kai apginamos visos užduotys ar projektai)

Literatūra:

- Gintautas Garšva, *Microsoft Windows Word 6.0 ir 7.0*, Vilniaus universiteto leidykla, 1996.
- R.Valatkaitė, Z.Kudirka, *Lietuvių-anglų-rusų-vokiečių terminų žodynas INFORMATIKA*, red. ISBN 9986-680-05-0, Matematikos ir informatikos institutas, Vilnius, 1999
- K.V.Paulauskas, R.Jasinevičius. *Aiškinamasis kompiuterijos žodynas*. Technologija, Kaunas, 1995
- G. Misevičius, A. Pincevičius, R. Rakauskas, R. Eidukevičius. *Aukštoji matematika*, TEV, Vilnius, 1999

Kursui klausyti reikalingos žinios: specialių reikalavimų nėra

Kurso turinys

1-as semestras

- bendri darbo su kompiuteriu principai, ergonomiškumas, techniniai, socialiniai, psichologiniai, kiti susiję aspektai,
- kompiuterių funkcionavimo principai ir schemos, operacinės sistemos, programinė kompiuterių įranga, taikomoji programinė įranga, jos klasifikacija ir apžvalga,
- tekstiniai redaktoriai, dokumento struktūra ir sudėtinės dalys, operacijos su jomis,
- programinė sistema *MicroSoft Word*, jos pagrindiniai darbo principai, komandos, procedūros, šablonai, darbo su šia programine sistema organizavimas,
- matematinės formulės, jų skaičiavimai kompiuterių pagalba, simboliniai ir skaitmeniniai skaičiavimai,
- matematinių skaičiavimų sistemos *MATLAB* ir/arba *MAPLE*, darbas su jomis, ypatybės, formulių grafikų vizualizacija,
- Internetas, publikavimo procedūros Internete,
- internetinių tinklapių ir svetainių projektavimas, kūrimas, diegimas, kalba *HTML, HTML*-dokumentų redaktoriai,
- vaizdų dėstymas internetinėse svetainėse, rastrinės grafikos redaktoriai, programa *Photo Editor*,
- elektroninio publikavimo reiškinys, sudėtingesnių leidinių rengimas,
- elektroninė leidybinė sistema *LATEX*, dokumento formavimo jos pagalba principai, jos veikimas,

Impacts of Information Technology on Individuals and Society

Information systems affect individuals in various ways. What is a benefit to one individual may be a curse to another. Some of the ways that IT may affect individuals, their perceptions and behaviors, will be considered next.

Job satisfaction

Although many jobs may become substantially more "enriched" with IT, other jobs may become more routine and less satisfying. For example, some analysts predicted that computer-based information systems would reduce managerial discretion in decision making and thus create dissatisfied managers.

Dehumanization

A frequent criticism of traditional data processing systems is their negative effect on people's individuality. Such systems are criticized as being impersonal; they dehumanize and depersonalize activities that have been computerized. Many people *feel a* loss of identity; they feel like "just another number" because computers reduce or eliminate the human element that was present in the noncomputerized systems.

While the major objective of new IT technologies such as Decision-Support-Systems is to increase productivity, they also create *flexible* systems that can allow individuals to input their opinions and knowledge. These technologies attempt to be people oriented arid user friendly.

One can pose the question of

“whether IT exists for the sake of people or whether people exist for the sake of the technology”.

This means the importance of achieving a balance between technology and the significance of the person in an organization.

Just another question

> "whether IT is just one organizational function or whether the organization is a function of IT".

Technical solutions to organizational problems can easily subvert the need to consider relationships among people in an organization.

The basic requirement for system development is the recognition that all work processes be designed because of people and for people.

Hardware and software accomplish many difficult tasks previously performed by people. This enables people to devote time to more creative tasks.

Now, however, **Executive Information Systems** and **Artificial Intelligence** are replacing people in the creative arena. People have become dependent on technology and may become a mere link in the chain.

One faces a half-serious yet worrying question:

> "will there be any place for man in the future automated world?"

Psychological impacts

> One example of a psychological impact resulting from the widespread use of home computers is that home computers threaten to have an even more isolating influence than was created by television. If people are encouraged to work and shop from their living rooms, then some unfortunate psychological effects – such as depression and loneliness-could develop.
>
> Another example is distance learning. Children can be schooled at home through IT, but the lack of social contact could be damaging.

IMPACTS ON HEALTH AND SAFETY

Computers and information systems are part of the job environment. Therefore, they may adversely affect our health and safety. To illustrate, we will discuss the effects of three issues:

- job stress,
- video display terminals,
- long time use of the keyboard.

Job Stress

Job stress is caused by many factors. With the onset of computerization, many workers **feel out of place** in their positions. They see computers executing many of the tasks they used to do, so they are unsure of their future place in the organization.

Management **does not usually discuss** such changes with workers, and management seldom makes changes in the affected job descriptions. Consequently, these individuals are left without a clear understanding of what their jobs are supposed to be and what they are supposed to do (i.e., increased role ambiguity).

Another factor that causes job stress **is an increase in workload and/or responsibilities**. Although computerization has benefitted organizations by increasing productivity, it has also created an ever-increasing workload.

Workers feel overwhelmed and start feeling anxious about their jobs and their performances. These feelings of anxiety can affect workers' productivity. Management's responsibility is **to help alleviate** these feelings by redistributing the workload among workers or hiring more individuals.

Sometimes **training** is necessary. Also, it is management's responsibility to design jobs properly and to initiate retraining programs; if these problems are not faced, an organization will be inefficient:
”it will have a computer system capable of doing the work needed, but it will not have the individuals capable of doing their work”.

Repetitive Strain Injuries

Exposure to *video display terminals* (VDTs) raised the issue of risk of radiation exposure, which has been linked to cancer and other health-related problems:

> for example, lengthy exposure to VDTs has been blamed for miscarriages in pregnant women.

However, results of the research done to investigate this charge have been **inconclusive**.

It is known:

- that exposure to VDTs for long periods of time can affect an individual's eyesight;
- other potential hazards, though not direct results of the VDT, are backaches due to long or inappropriate sitting in front of computers and muscle tension in peoples' fingers and wrists.

Carpal tunnel syndrome is a pernicious and painful form of repetitive strain injury that affects the wrists and hands – it has been associated with the long-term use of the keyboard.

Repetitive strain injuries can be very costly to corporations. Since 1994, there have been more than 2,000 lawsuits against computer manufacturers and employers.
For example, a lawsuit against IBM filed in 1994 requested $11.5 million for inappropriate design of a keyboard that caused carpal tunnel syndrome.

Essening The Negative Impact On Ealth And Safety

Designers are aware of the potential problems associated with prolonged use of computers. Consequently, they have attempted to design a better computing environment.

Research in the area of **ergonomics** (or human factors) provides guidance for designers. For instance, ergonomic techniques focus on creating an environment for the worker that is well lit and comfortable.

Devices such as antiglare screens have helped alleviate problems of fatigued or damaged eyesight, and chairs that contour the human body have helped decrease backaches.

Other Impacts

Individuals can be affected by computerization in many ways. Actually, computers **change the manner** in which people live, work, learn, and entertain themselves.

Interaction between individuals and computers are so numerous that entire volumes have been written on the subject.

The figure below shows the individual circled by electronic transfer of money (to be used in home shopping and smart cards) that allows purchase of products and services. These are organized in the intermediate ring as six systems (consumer, education, and so on). Finally, the outer ring gives some examples of specific products or services in each system:

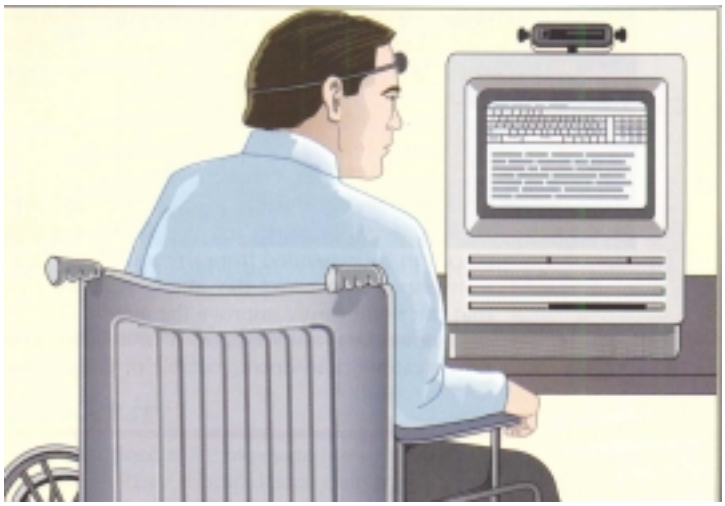
SOCIETAL IMPACTS

The societal implications of IT will be far reaching. Use of IT already has had many direct beneficial effects on society – solving complicated human and social problems such as medical diagnosis, computer-assisted instruction, government program planning, environmental quality control, and law enforcement.

Problems in these areas could not have been solved economically-or at all-without IT.

Opportunities For People With Disabilities

Adaptive equipment permits people with disabilities to perform ordinary tasks with computers. In figure below one can see a PC for a motor-disabled person:



Changing Role Of Women

IT is changing the "traditional" role of women in the workplace. The opportunity to work at home helps women with young children assume more responsible managerial positions in organizations.

This could lead to better pay for women who can devote more attention to business while they still carry on duties at home.

Improvements In Health Care

EMERGING TECHNOLOGY:

Expert systems help individuals to be healthier and wealthier

IT has caused major improvements in health care delivery ranging from better and faster diagnoses to expedited research and development of new drugs, to more accurate monitoring of critically ill patients.

One technology that has made a special contribution is artificial intelligence. Al supports various tasks carried out by physicians and other health-care workers. Of special interest are expert systems that support diagnosis of diseases and the use of machine vision in enhancing the work of radiologists. Recently, surgeons started to use virtual reality to plan complex surgeries.

Help For The Consumer

Several IT products are in place, and many more will be developed, to help the layperson perform tasks that are skilled or tasks that are undesirable. *TaxCut* is an expert system product that can help in tax preparation; *Willmaster* is an ES that helps a layperson draft a simple will; and *Wines on Disk* advises the consumer how to select wines. Intelligent robots will clean the house and mow the lawn. These and many other improvements can contribute to an increased quality of life.

QUALITY OF LIFE

On a broader scale, IT has implications for the **quality of life.** An increase in organizational efficiency may result in more leisure time for workers.

The workplace can be expanded from the traditional nine-to-five job at a central location to twenty-four hours-a-day at *any* location.

This expansion provides a flexibility that can significantly improve the quality of leisure time, even if the total amount of leisure time is not increased. Our health and safety can also be improved, since robots can work in uncomfortable or dangerous environments.