Information Technology Impact on the Evolving Society

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Changes in society because of Information Technology

Changes in:

• power • control • influence • love	Different words which often mean roughly the same thing, depending on who controls whom, who benefits, who likes or dislikes it.

Traditional examples

Invasion of privacy or unbalanced power/influence structure?

Computer records about an individual: John pays a bill for a hotel room for himself and his wife in Barcelona at the same time as his wife pays her hairdresser at home in Sweden.

Government agencies compare the income which an individual has specified in his income tax return with the income he has specified to the insurance company (which in Sweden is government-run for basic health insurance for everyone).

An employer checks when an employee comes and goes, how long he stays in the toilet, how much time it takes to perform various work tasks, which phone calls he makes, etc., etc.

People are forced, by a computer, to perform tasks in the way planned by the designers of the software. This may not be how they like to do it, it may also reduce their possibilities to find better ways of performing tasks, and to be able to handle unusual situations which the software was not planned for.

Traditional methods of handling these problems

Swedish data act: Regulation of "invasion of privacy"

Anyone registering personal information must have a permission, this permission must specify what you register, how you use this information, to whom you give it. Special strict controls of moving information between data bases, moving information outside of Sweden, registering information about religion, political opinions, illnesses, sexual behaviour, etc.

Strict compliance with this act would make almost all use of the Internet illegal. Example: Sending an e-mail message, especially if you mention someone else's name in the text of the message. "Dear mother. John is own with the flu!"

1978 A computer message service was totally forbidden by the Swedish Data Inspectorate.

1979 The same service was allowed, provided no messages discussing politics and religions were allowed.

1992 An author was forbidden from using a computer to write his book. Decision overturned on appeal by the government.

Problems with computer control of human activities

Can a computer decide what is right and wrong?

There are very often exceptions which the computer does not understand. We cannot teach the computer to understand all exceptions.

Case Example: Distortion of communication

There's an NT box on my desk that someone else uses every now and then. This machine is otherwise used as my programming box and backup server.

All of a sudden, my programming files were being corrupted in odd places. I thought "hmm, my copy must be corrupt". So I refreshed the files. No change. "hmm, the code depot copy must be corrupt".. Checked from other machines. No problem there. Viewed the file from a web based change browser in Internet Explorer. Same corruption in the file. Telnet-ed to the server machine and just cat-ed the file to the terminal. Same problem. What's going on?

The lines that were corrupted were of the form
```
#define one 1 /* foo menu */
#define two 2 /* bar baz */
```
What I always saw <u>on this machine only</u> was:
```
#define one 1 /* foo       */
#  fine two 2 /* bar baz */
```

In another case, the word "`RefreshItems`" was corrupted.

Case example: Calendaring system

Task: Find suitable times for a meeting with a number of participants.

Requirements	Solution
Basic requirements	Store everyone's personal calendars, as well as calendars for meeting rooms, equipment, etc. Find a date where everyone is free.
No time available suitable for everyone	Assign different importance to different people for this particular meeting, find the time where most of the most important people can come.
Still no time available which suits everyone	Assign different importance to different meetings, allow rescheduling of less important meetings to give place for more important meetings.
Some people travelling wanted several meetings the same day.	Schedule combinations of several meetings the same day for people travelling to the meeting location.
Multi-day meetings	Handle meetings which continue over more than one day.
Bill is not at his best on Monday mornings.	Can this be stored in the data base of the calendaring system?

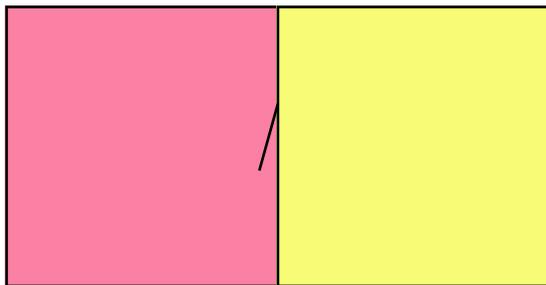# Where computers might not understand exceptions:

Security systems	Understanding human feelings	Priority issues
Traffic control, locks, safety devices.	Do not schedule an important meeting with the boss before 10 a.m.	This is so important that we must change what we have already decided.

Always stop drunken driving?

Always enforce a speed limit?

Lock with zone control.
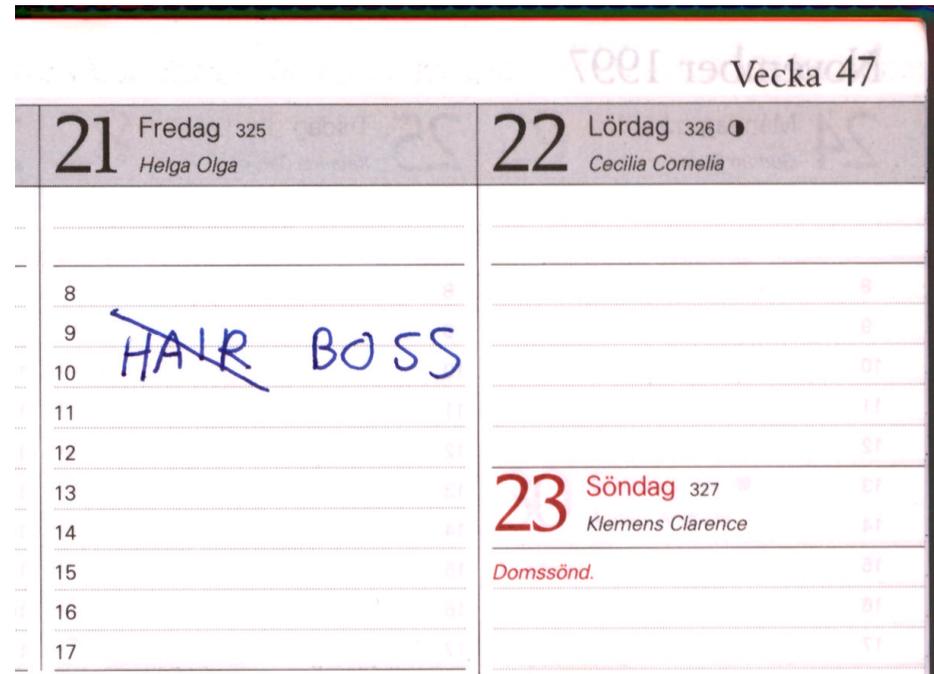
Traditional methods of handling these problems

Trade unions require: Employee influence on software development

Good, but does not solve the whole problem. Even with employee influence, software may be designed to control people, restrict their opportunities to do things in better ways, restrict their possibilities of coping with unusual cases not planned for in the software.

Also a risk, even with employee influence, that the computers are designed either for novice users (too restrictive for experienced users) or for experiences users (too difficult for novice users).

Standard software (word processors, spread sheets, etc.) may be better than custom-made software, because in order to sell such software, they have to be designed to be easy to use for beginners, flexible for experienced users and extensible for handling new and unforeseen uses.

Humans and computers

Humans may be better at	Computers may be better at
• Understanding new or different problems and handling them adequately • Evolving new and better ways of handling tasks • Making associations, seeing similarities, creating	• Handling taks they were programmed to handle and which can be adequately described in a program • Routine processing of large amounts of data

Example: Deciding on a suitable date for a face-to-face meeting

• Who are able to come at alternate dates?

• Are all equally important?

• Can another meeting be moved?

• "John is not at his best on Monday mornings"

Authoritarian attitude	Democratic attitude
People are lazy and undependable and must be watched and controlled	People are dependable, can be motivated and can control themselves
The main goal for information systems is to give better support for managers	All employees should get support from the information system
Efficiency in the performance of work elements must be increased	The functionality and possibillities for growth of the organization shall be promoted
Work tasks should be split into many small elements, where each empoloyee only gets the information necessary to perform his/her element	Work tasks are organized so that changes and new needs are easier to handle, by promoting high competence and flexible contact and organizational patterns

Future usage of computers

Much more information will be stored in computers:

- What we read
- What we buy
- Where we are
- What we are interested in

Much more will be controlled through computers:

- Reading
- Buying
- Traveling
- Getting information

Computers will be more invisible

- Computer in phone, TV, toaster
- Price display boards in supermarkets
- Computers directly connected to the nervous system