Applications of computers: social and economic implications

Technology, Computer

You should have an awareness of as many applications as possible, and for each, try to know the following: 1 The purpose of the application. 2 The required outcome. 3 The overall system design, including both the computerized and the microcomputers parts of the application. 4 The necessary inputs to the system and the means by which any data is captured. 5 The overall organization and processing of the data within the system. 6 The use and organization of the major software and hardware components of the system. 7 The need for recovery in the event of a system failure. The interface between the system and its users. 9 The effectiveness of the system in practice. 10 The effects of the application on individuals and organizations. Communication And Information Systems Data is exchanged between computers. The data can be in the form of text, images, sound or video. Electronic mail (e-mail) Electronic conferencing simple message exchange. Can attach other files can either be a text, voice or video conference On-Line Services & Remote Databases Computers are often placed in locations where the public can use them to lookup information.

Information retrieval Library systems Multimedia systems online databases, encyclopedias, dictionaries, bus timetables, etc. Documents are stored digitally where they can be searched stored information contains text, sound, video, etc. Commercial And General Data Processing These are often batch-processing systems involving data being collected over a erred of time, and then processed later. The collected data is stored in a transaction file, and this is used to update the master file to give a new master file.

Banking systems Personnel records Stock control Order processing bank accounts are updated based on daily transactions employee's pay is calculated based on hours worked when items are sent / received, the stock is updated received orders are dealt with Industrial, Technical And Scientific Uses Data is entered into the computer and the computer can then manipulate the data. In the case of CAD systems, products can be designed and tested completely within he computer's memory.

In forecasting systems, predictions are made about the future based on previous data, and a model of how the system works. Weather Forecasting Computer-aided design try to predict weather, taking data from sensors, using computer models of weather systems (CAD) designs for objects can be designed, altered and tested within the computer, prior to manufacture Monitoring And Control Systems A computer is used to monitor a system through the use of sensors (such as light, heat, etc. The computer can then operate devices to control the system (such as pumps, valves, etc.) Monitoring hospital patients hacks heart rate, etc. Setting off an alarm if low Nuclear power station control monitors temperature, etc. And adjusts coolant Traffic survey and control checks the number of cars, alters traffic light timings Automation And Robotics The use of computers to control other mechanical devices. Usually requires some sort of interface which allows the computer to receive data from input sensors, and to control output devices such as motors.

Domestic automation Automatic navigation Industrial robots washing machines, microwaves aircraft, ships, cars (GSM satellite navigation) used to

work on manufacturing lines. Can work non-stop, 24 hours a day, 365 days a year. Can work in hazardous areas Expert Systems And Artificial Intelligence Artificial Intelligence (AY) is the attempt to simulate the human brain, and its thought processes, using computer hardware and software. Expert systems use AY techniques to replace a human expert.

All of the humans knowledge on a subject is entered into the computer as a series of rules. Medical diagnosis Speech recognition data is fed into the system, and questions are answered. The expert system rules then come up with the best diagnosis (usually with a % confidence level) hacks voice patterns to determine what was spoken Miscellaneous Areas Some other applications of computers are: Computer-aided learning (CAL) CD-Rooms, etc. Here you can learn at your own pace, like having your own personal tutor Computer animation for films and TV. Special effects, etc. 1. 2 The Social And Economic Implications Of The Use Of Computers Social And Economic Effects Effects on people, organizations and on society in general. Redundancies De-shilling Electronic 'scabbing' Tactical striking 'New tech,' agreements jobs lost when staff replaced by computer-based systems replacement of skilled staff by computers.

Staff are then left to do less skilled Jobs if staff are striking, work can easily switched to non-striking staff via a network, even in a different country unions maximize impact of strikes by selecting computing staff first. Whole company is then affected benefits to workers (cleaner, safer workplace) and management (more cost-effective) of using computerized systems Economic Reasons For The Use Of Computers There are many financial reasons for

using computers, and computer controlled systems, even though they are expensive to set-up initially.

More efficient tasks completed quicker, and with lest wastage Work longer than people automated systems need no rest, can work for 24 hours a day Save on wages computers can often do the work of several people, so people are made redundant Changes To Existing Methods, Products And Services Businesses change the way they work, and provide different, and better services to clients.

On-line banking E-commerce EPOSES FEET more convenient for customer, cheaper for banks, less real staff required to deal with cash selling goods online means less overheads, so better prices for customers, and more profit for company (Electronic Point of Sale) tills in shops where the good researched are automatically taken from the database of stock.

Can automatically generate orders for new stock (Electronic Funds Transfer) allows people to pay for goods using a card which is 'swiped' in the store, authorizing the transfer of money from the customer's bank account Development Of New Products And Services Computers have lead to the development of new markets and businesses. ; Internet service providers Web-design services Internet cafes Changes In The Working Environment Using computers within businesses has altered the environment that we work in Cleaner and safer Work injuries can go up ungenerous / messy Jobs done by computer systems due to prolonged computer use - RSI, back ache, etc.

Changes In Employment The use of computers in the workplace has an impact on the way people work Retraining of staff Individual training software packages upgraded, staff need to be trained. This is often a regular thing. However... Training can be personalized to staffs needs through the use of CAL systems, CD-Rooms, etc. Privacy And Integrity Of Data So much personal data is stored within computer systems that companies and governments have to have guidelines and laws to protect the privacy of people and their information.

Data Protection Legislation The Data Protection Act gives the following requirements to anyone who stores data about someone else: Person must give permission for data to be stored Data must not be used for purposes other than those it was given for Must not store more data than is necessary for the purpose Data must be kept up-to-date Data should not be kept for longer than is necessary Data must be protected against unlawful access, or accidental loss Data must not be transferred outside of EX. unless the country also has data laws Security And Reliability Data must be protected.

This involves a number of procedures. Back-ups of critical ATA Batch-processing Archiving of old data should be performed on a regular basis. A full copy of all files is taken (can use CD-R, magnetic tape, etc.) Usual technique is to keep 3 generations of back-ups (today's, yesterday's and the day borer's). This is the grandfather, father, son system. Backup of both transaction files and master files required. If today's master file is lost, we can re-build it from yesterday's backed-up master file and transaction file. O reduce the amount of system resources required (disk space, etc.) and keep

the system running smoothly, old data that is no longer used (but may be required for future preference) is moved into an archive file. Consequences Of System Failure The requirements for security and reliability vary considerably depending on the nature of the application. For example, a failure during a batch update of a sequential master file is irritating and will cause delay, whereas a failure in an air traffic control system could well have catastrophic results.

Safety-critical systems (such as air-traffic control, or medical systems) have much more emphasis (and money) placed on reliability. Hacking And Other Computer Crime Computer crime includes activities such as the cracking of ineffective security yester to gain unauthorized access to commercially sensitive or confidential personal files, and fraud through the improper transfer of funds from one account to another. Computer criminals may work within the organization or may be outsiders.

Precautions can be taken. Physical security Complex security codes Firewall soft/hardware Encryption of data Monitoring of all access only allow authorized users near the computers use of good passwords (not Just 'Fred' or 'Password') prevents access from outside the network can only be read by someone with the password trace users who are accessing and misusing system Computer viruses Sensible precautions should be taken.

Up-to-date virus protection Limited use of disks, etc from outside your network Firewall software / hardware - prevents viruses using your Internet connection 2 System Analysis 2. 1 Systems Analysis Systems Analysis

describes the process followed when replacing or upgrading a system with a computer-based one. The steps followed are: Fact-finding Feasibility study Analysis System design Implementation Testing Documentation Evaluation Identification Of The Problem (Fact-finding) What exactly is/are the problem(s) that needs to be solved?

How do we find out as much as possible about the present system? We need to do some fact-finding: ; Interviewing people who work for the company Questionnaires Observation of people at work within the company Inspecting documents that are used within the present system Deciding And Stating Specific Desired Outcomes (Feasibility Study) Before continuing with solving the problem identified, it is important that it will be worthwhile.

The feasibility Study, and the resulting Feasibility Report, will give an idea of: ; A brief description of the business and the sections which will be affected A ascription of what the system is required to do (objectives) Some early system designs to allow estimations of time and cost Details of why some designs were chosen, and some rejected Approximately how long the project will take Approximately how much it will cost Cost / benefit analysis detailing whether the solution will save money or not Plan of further action Conclusions as to whether to continue, and if so, how Based on the contents of the study and report, the company will decide if they are going to proceed with the project.