



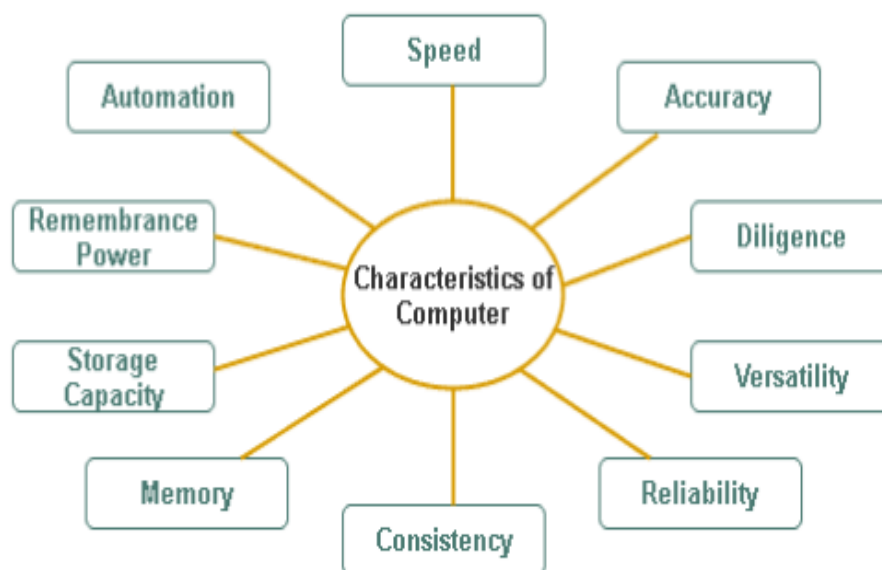
COMPUTERS

A computer is a machine or device that performs processes, calculations and operations based on instructions provided by a software or hardware program. It has the ability to accept data (input), process it, and then produce outputs.

COMPONENTS OF COMPUTER

- Input devices : Input devices convert the data to be processed into a format acceptable to the computer. The data is then passed on to the central processing unit of the computer. The input devices include punch cards, magnetic tapes, key board and so on.
- The central processing unit (CPU) : The CPU is the brain of the computer. All major calculations and comparisons are made here. It has three constituents, the memory units, the control unit and the arithmetical logic unit.
- The output devices : The output devices accept the result produced by CPU and supply the results to users. Printers and visual display units are the popular output devices of computers.

CHARACTERISTICS OF COMPUTER



APPLICATIONS OF COMPUTER

1. Drug information storage and retrieval system :

(i) The drug information about pharmacological actions, adverse effects, toxicity, drug interactions etc. is necessary for pharmacist and this search has been simplified by the use of computers.

(ii) For retrieval of medical information international data banks are available, example includes: Excerpta medica MEDLARS Bitnet Biosis Ama/net



2. Hospital and clinical pharmacy :

(i) Maintenance of patient census, lists and patient billing Computers are used in hospitals to maintain patient record database which is continually updated to reflect the current status of all patients. The information stored include—name, age, sex, weight, height, allergies, physician, present diagnosis, other diseases, drugs prescribed and special notes.

(ii) Preparation of letters and labels.

(iii) For drug store maintenance purchase and inventory control in hospital pharmacy computers are very useful.

(iv) The clinical pharmacist may use computer for therapeutic drug monitoring which is required in cases of drugs which have narrow therapeutic range.

(v) Computer programs are used to calculate drug dosage schedules to suit the individual patient.

(vi) Apart from this drug interactions may be screened using programs like MEDIPHOR Monitoring and Evaluation of Drug Interactions by Pharmacy Oriented Reporting and PADIS Pharmacy Automated Drug Interaction Screening.



3. Drug information center :

- All countries should provide this service independently or as part of a regional network. The service should include collecting reviewing evaluating indexing and distributing information on drugs to health workers.
- This allows access to clinical experience libraries research facilities and educational activities. Drug and poisons information centres should be supported by government authorities. They require clinically trained staff with access to specialist support.
- In some cases drug information services can be provided in conjunction with toxicology services, pharmacovigilance programs etc.
- WHO recognizes independent drug information centres as a core component of national programs to promote the rational use of drugs.
- Pharmacists and other health care workers routinely provide drug information to the community.
- WHO India Country Office in collaboration with the Karnataka State Pharmacy Council KSPC have established drug information centres in Haryana-Sirsa, Chhattisgarh-Raipur, Rajasthan-Jaipur, Assam- Dibrugarh and Goa-Panaji.



4. Computer-assisted drug design :

The search for new effective and safe drugs has become increasingly sophisticated and costly. The process of drug discovery and development is a long, tedious, and difficult. Occasionally new drugs are found by accident. More frequently they are developed as a part of an organized effort to discover new ways to treat human disease but also to improve the quality of life. In general, the computer-aided drug design technique has the ability to accomplish both these goals and to improve the efficiency of the process as well.

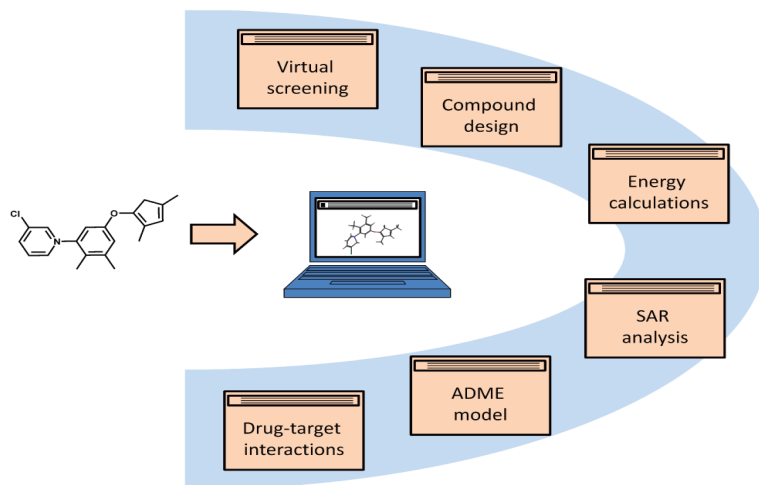
Examples of some computer-assisted techniques used are,

- a) Computer-assisted drug design - CADD
- b) Computer-assisted molecular design - CAMD
- c) Computer-assisted molecular modeling - CAMM

Some recent examples of CADD are,

- Design of thymidylate synthetase inhibitor as anticancer agents.
- Design of HIV protease inhibitors as antiviral agents.
- Discovery of novel sweeteners using a sweet taste receptor model.

Computer graphics like crystallography, receptor mapping, molecular mechanics and dynamics, NMR, molecular docking, quantum mechanics, Structure Activity Relationship, QSAR etc., are widely used.



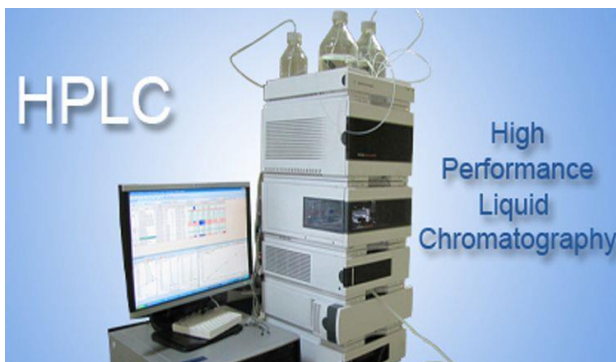
5. Pharmaceutical manufacturing industry :

- The successful manufacturing requires knowledge and greater understanding of manufacturing processes product design methods and manufacturing system design methods.
- There are many computer aids available for manufacturing bulk drugs and pharmaceutical products.
- Computer Aided Manufacturing-CAM softwares are usually product oriented.
- Spread sheet software has been found useful for material and energy balancing cost estimation and economic analysis.



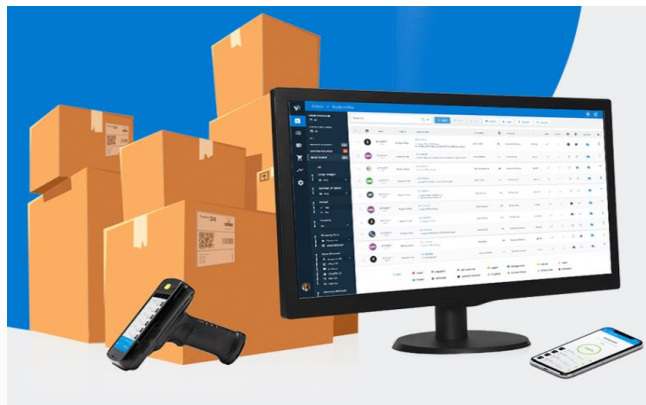
6. Pharmaceutical analysis :

- The applications of computers include data handling processing storing file search of display.
- The results in analysis of drugs pesticides herbal extracts etc. are generated in graphical form as a spectrum containing number of peaks.
- The computer compares the spectrum of given sample with spectrum of pure compound with the use of library systems available in the software of the analytical instruments HPLC, HPTLC, GLC, MS, IR etc.



7. Inventory Control :

- A computerized inventory system enables a company to monitor inventory levels in real-time throughout the day. Also known as inventory management software, businesses can stay updated with inventory orders, counts and sales.
- A computerized inventory system can help you avoid costly mistakes, know what is and isn't moving, get your whole team on the same page, and help you keep track of inventory from anywhere.
- By using a computerized inventory system, all aspects of your business will run like a well-oiled machine.
- Computerization has revolutionized inventory management, as technologies ranging from automatic scanners to radio frequency identification chips now allow businesses to track their inventory from the moment a company buys it wholesale to the moment the products leave the building in the hands of a customer.



8. Maintenance of records :

A computer system used in pharmacy practice should assure that the patient record database is being regularly updated as it reflects the current status of all patients. This helps in gathering information about all the new patient admissions, discharges & transfers. It also produce other informations like present diagnosis, allergies, weight, height, name of attending physician & other special notes about the patient.

Advantages :

- Reduce errors and improve patient safety.
- Improve efficiency.
- Improve reimbursements.



It helps to maintain various types of records like,

- Medication Order Records
- Patient Medication Profiles
- Medication Administration Records

Medication order - refers to the process of providers entering and sending treatment instructions – including medication, laboratory, and radiology orders – via a computer application rather than paper, fax, or telephone.

Patient medication profiles – which provides information on the patient’s current medication & also previous history. This provides sufficient data for consultation.

Medication administration records – Keeping complete medication record proves to be helpful for all the health professionals in hospitals.

Advantages :

- Reduce errors and improve patient safety.
- Improve efficiency.
- Improve reimbursements.
- Consumption of more time, personnel & money is reduced.