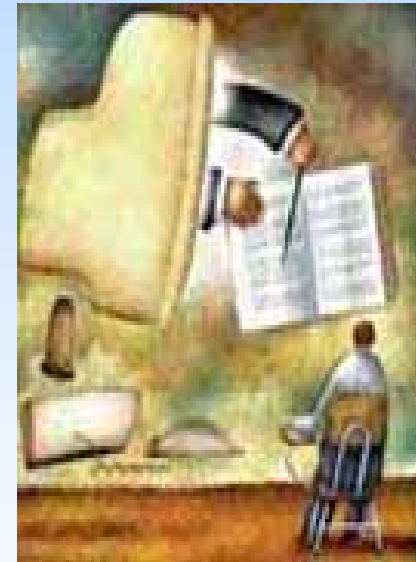


Automated tools and technology

- In the not too distant past the principle tools of the systems analyst were paper, pencil, and flowchart template.
- Today entire suites of automated tools have been developed, marketed and installed to assist systems development teams



Automated tools and technology

- **Benefits**

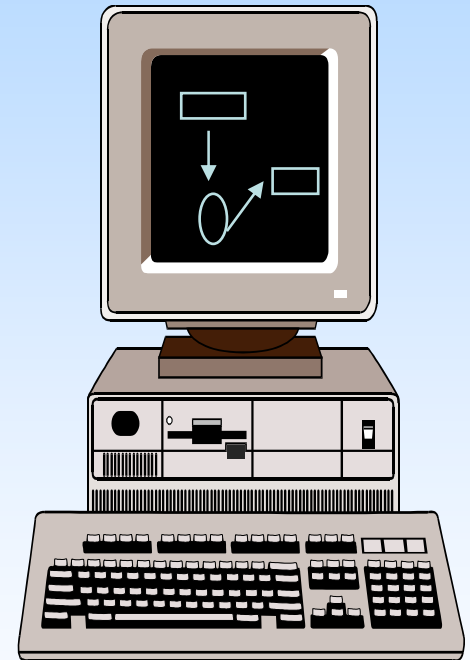
- Improved productivity – through automation of tasks
- Improved quality – because automated tools check for completeness, consistency, and contradictions
- Better and more consistent documentation – because the tools make it easier to create and assemble consistent, high-quality documentation

Automated tools and technology

- Benefits
 - Reduced lifetime maintenance – because of the aforementioned system quality improvements combined with better documentation
 - Methodologies that really work – through rule enforcement and built-in expertise

Automated tools and technology

- There are three classes of automated tools for developers.
 - Computer-aided systems modeling
 - Application development environment
 - Project and process managers



Computer-Assisted Systems Engineering (CASE)

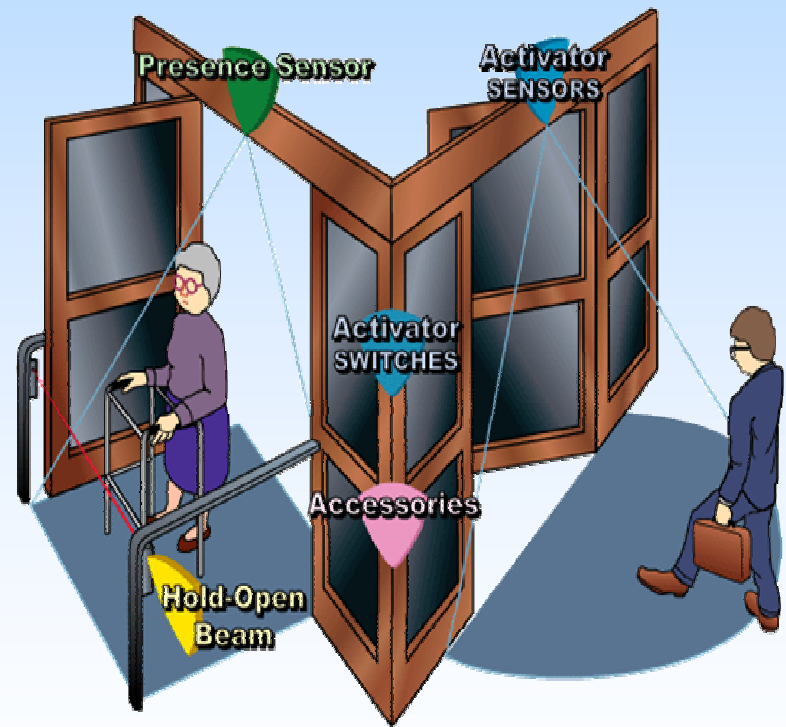
It is filling
Automatically

- The use of automated software tools that support the drawing and analysis of system models, detailed descriptions and associated specifications.
- Some CASE tools also provide prototyping and code generation capabilities.



Computer-Assisted Systems Engineering (CASE)

It is the application of information technology to system development activities, technique and methodologies. *Case tools* are programs that automate or support phases of a system development life cycle.



Computer-Assisted Systems Engineering (CASE)

- CASE Repositories
 - A system developers' database where developers can store system models, detailed descriptions and specifications, and other products of system development.
 - A collection of facilities, for creating system models and documentation
 - Also known as data dictionary and encyclopedia

Computer-Assisted Systems Engineering (CASE)

- CASE Facilities

To use the repository, the CASE tools provide some combination of facilities

- Diagramming tools: used to draw the system models required or recommended in most system development methodologies

Computer-Assisted Systems Engineering (CASE)

- CASE Facilities

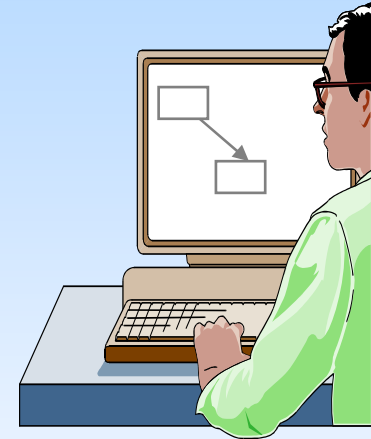
- Diagramming tools:

- ♥ Include capabilities

- to produce ERDs, DFDs etc.
 - to store the details internally
 - to change and redraw,

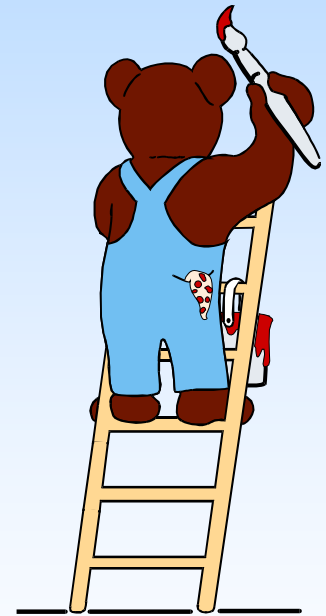
Eliminates an activity that analysts find both tedious and undesirable.

- ♥ Perform online syntactic checks and semantic checks



Computer-Assisted Systems Engineering (CASE)

- CASE Facilities
 - Dictionary tools: used to record, delete, edit, and output detailed documentation and specifications
 - Design tools: used to develop mock-ups of system components such as inputs and outputs



Computer-Assisted Systems Engineering (CASE)



- CASE Facilities
 - Quality management tools: analyze system models, descriptions and specifications, and designs for completeness, consistency, and conformance to accepted rules of the methodologies.

Computer-Assisted Systems Engineering (CASE)



- CASE Facilities
 - Documentation tools: used to assemble, organize, and report on system models, descriptions and specifications, and prototypes that can be reviewed by system owners, users, designers and builders.

Computer-Assisted Systems Engineering (CASE)



- CASE Facilities
 - Design and code generator tools: automatically generate database designs and application programs or significant portions of those programs

Computer-Assisted Systems Engineering (CASE)



- CASE Facilities
 - Testing tools: simulate transactions and data traffic, measure performance, and provide configuration management of test plans and test scripts.
- Eg. Rational Team Test, Rational Purify, Rational Visual PureCoverage

Computer-Assisted Systems Engineering (CASE)

- Forward and Reverse Engineering
 - Two distinct ways to develop system models.
- Forward Engineering: a CASE tool capability that can generate initial software or database code directly from system models.
- e.g. generate a program directly from a flow chart
- Reverse Engineering: a CASE tool capability that can automatically generate initial system models from software or database code
- e.g. generate a flow chart from an existing program

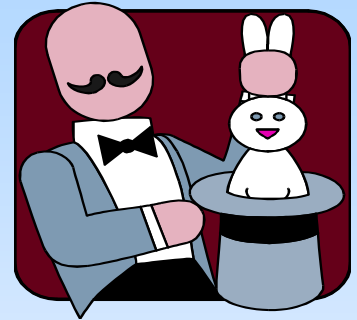
Computer-Assisted Systems Engineering (CASE)

- Systems designed to automate the stages of Systems Development.
- Capable of bringing clear benefits to Systems Development.



**You will only get the most of it,
if you can employ
the Techniques and the Technology
successfully together.**

Computer-Assisted Systems Engineering (CASE)



General Characteristics

- **Break down complexity**

- ♥ Decompose requirements and design into manageable components

- **Presentable to several audiences**

- ♥ End users,
 - ♥ Contracting organization paying for the Software development,
 - ♥ Developers

Computer-Assisted Systems Engineering (CASE)

General Characteristics...

- Cheaper than building using traditional methods
- Verifiable
- Maintainable
- Graphically Oriented
 - ♥ Easy to understand a graphical illustration

Computer-Assisted Systems Engineering (CASE)

PC CASE Tools

- Analyst/Designer Tool kit
- Automate Plus
- CASE 2000
- Excelerator
- Information Engineering Workbench
- TeamWork
- Visible Analyst
- Deft
- Easy CASE
- Oracle *CASE
- Designer 2000
- OOther
- Rational Suit
- Together

Benefits of using CASE tools in Systems Development

- CASE tools improve
 - Quality
 - Productivity
 - The amount of interaction between developers and users
- **However the Organizations must consider**
 - Whether the features of CASE fit the methods they use or
 - Whether they wish to modify their methods to obtain CASE benefits.



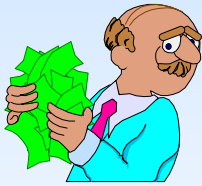
Benefits of using CASE tools in Systems Development

- Better documentation (mostly because the tools make it easier to create and assemble consistent, high-quality documentation)
- Reduce lifetime maintenance (because of the aforementioned system quality improvements combined with better documentation)
- Reverse Engineering, Forward Engineering support



Benefits of using CASE tools in Systems Development

Most Important Elements in the Development Process



are



Skills and Capabilities of the
Systems Analysts.

Tools assist but do not replace them

Application Development Environment (ADEs)

- An integrated software development tool
 - Provides all the facilities necessary to develop new application software with maximum speed and quality.
 - Also known as integrated development environment (IDE)
- e.g. IBM's Websphere, Oracle's Developer, Microsoft's Visual Studio.NET ...etc

Application Development Environment (ADEs)

- Provide a number of productivity and quality management facilities
 - Programming language or interpreters:
 - help programmers quickly identify and solve programming problems
 - Interface construction tools:
 - help programmers quickly build the user interfaces using a component library
 - Middleware:
 - helps programmers integrate the software being developed with various databases and computer networks

Application Development Environment (ADEs)

- Provide a number of productivity and quality management facilities (cont.)
 - Testing tools:
 - used to build and execute test scripts that can consistently and thoroughly test software
 - Version control tools:
 - help multiple programmer teams manage multiple versions of a program



Application Development Environment (ADEs)

- Provide a number of productivity and quality management facilities (cont.)
 - Help authoring tools:
 - used to write online help systems, user manuals, and online training.
 - Repository links:
 - permit the ADE to integrate with CASE tool products as well as other ADEs and development tools.



Process and Project Management Tools

- CASE tools and ADEs support analysis, design and construction of new information systems and software
- Process manager and project manager application tools are intended to support cross life-cycle activities.
- Project management tools – Microsoft's project, Niku's Open Workbench and Project Manager

Process and Project Management Tools

- Process manager application
 - An automated tool
 - Helps to document and manage a methodology and routes, its deliverables, and quality management standards.
 - Also known as methodware

Process and Project Management Tools

- Project manager application
 - An automated tool
 - Helps to
 - plan system development activities,
 - estimate and assign resources,
 - schedule activities and resources,
 - monitor progress against schedule and budget,
 - control and modify schedule and resources, and
 - report project progress.