

MODULE 14

CASE TOOLS

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CASE TOOLS

MOTIVATION

Industries routinely use CASE tools as productivity aid to reduce time to develop systems. A student should know what these tools are and how they are useful. The intention of this module is not to make you an expert in the use of these tools but to make you aware about them and their importance in industrial practice.

LEARNING GOALS

- What are CASE tools?
- Why are they important in systems analysis and design?
- When are they used?
- How are they used?

LEARNING UNIT 1

CASE Tools and their importance

CASE tools stand for Computer Aided Software Engineering tools. As the name implies they are computer based programs to increase the productivity of analysts. They permit effective communication with users as well as other members of the development team. They integrate the development done during each phase of a system life cycle and also assist in correctly assessing the effects and cost of changes so that maintenance cost can be estimated.

Available CASE tools

Commercially available systems provide tools (i.e computer program packages) for each phase of the system development life cycle. A typical package is Visual Analyst which has several tools integrated together. Tools are also in the open domain which can be downloaded and used. However, they do not usually have very good user interfaces.

Following types of tools are available:

- System requirements specification documentation tool
- Data flow diagramming tool
- System flow chart generation tool
- Data dictionary creation
- Formatting and checking structured English process logic
- Decision table checking
- Screen design for data inputting
- Form design for outputs.
- E-R diagramming
- Data base normalization given the dependency information

When are tools used

Tools are used throughout the system design phase. CASE tools are sometimes classified as upper CASE tools and lower CASE tools. The tools we have described so far are upper CASE tools

They are tools which will generate computer screen code from higher level descriptions such as structured English and decision tables, such tools are called lower CASE tools

Object Oriented System Design Tools

Unified Modelling Language is currently the standard. UML tool set is marketed by Rational Rose a company whose tools are widely used.

This is an expensive tool and not in our scope in his course.

LEARNING UNIT 2

How to use the tools

- Most tools have a user's guide which is given as help files along with the tool
- Many have FAQ's and search capabilities
- Details on several open domain tools and what they do is given below.

I. SYSTEM FLOWCHART AND ER-DIAGRAM GENERATION TOOL

Name of the tool: SMARTDRAW

URL: This Software can be downloaded from: <http://www.smartdraw.com>. This is a paid software, but a 30-day free trial for learning can be downloaded.

Requirements to use the tool: PC running Windows 95, 98 or NT. The latest versions of Internet Explorer or Netscape Navigator, and about 20MB of free space.

What the tool does: Smartdraw is a perfect suite for drawing all kinds of diagrams and charts: Flowcharts, Organizational charts, Gantt charts, Network diagrams, ER-diagrams etc.

The drag and drop readymade graphics of thousands of templates from built-in libraries makes drawing easier. It has a large drawing area and drawings from this tool can be embedded into Word, Excel and PowerPoint by simply copy-pasting. It has an extensive collection of symbols for all kinds of drawings.

How to use: The built-in tips guides as the drawing is being created. Tool tips automatically label buttons on the tool bar.

There is online tutorial provided in:

<http://www.smartdraw.com/tutorials/flowcharts/tutorials1.htm>

<http://www.ttp.co.uk/abtsd.html>

II. DATA FLOW DIAGRAM TOOL

Name of the tool: IBMS/DFD

URL: This a free software that can be downloaded from: <http://viu.eng.rpi.edu>

Requirements to use the tool: The following installation instructions assume that the user uses a PC running Windows 95, 98 or NT. Additionally, the instructions assume the use of the latest versions of Internet Explorer or Netscape Navigator. To download the zip files & extract them you will need WinZip or similar software. If needed download at <http://www.winzip.com>.

What the tool does: The tool helps the users draw a standard data flow diagram (a process-oriented model of information systems) for systems analysis.

How to use: Double click on the IBMS icon to see the welcome screen. Click anywhere inside the welcome screen to bring up the first screen.

Under "Tools" menu, select DFD Modeling. The IBMS will pop up the Data Flow Diagram window. Its menu bar has the File, Edit, Insert, Font, Tool, Window and Help options. Its tool box on the right contains 10 icons, representing (from left to right and top to bottom) pointer, cut, data flow, process, external entity, data store, zoom-out, zoom-in, decompose, and compose operations, respectively.

Left click on the DFD component to be used in the toolbox, key in the information pertaining to it in the input dialogue box that prompts for information.

To move the DFD components: Left click on the Pointer icon in the tool box, point to the component, and hold Left Button to move to the new location desired in the work area.

To edit information of the DFD components: Right click on the DFD component. The input dialogue box will prompt you to edit information of that component.

Levelling of DFD: Use the Decompose icon in the tool box for levelling

To save the DFD: Under File menu, choose Save or SaveAs. Input the name and extension of the DFD (the default extension is DFD) and specify folder for the DFD to be saved. Click OK.

III. TOOL TO CONVERT DECISION TABLE TO STRUCTURED ENGLISH

Name of the tool: COPE

URL: This is a free tool and should be worked online at <http://www.cs.adelaide.edu.au/users/dwyer/examples.html>

What the tool does: Cope is a program that converts decision tables to Cobol source statements

How to use: The general arrangement of a Cope decision table is shown in Example below. This table consists of a heading and four rows. The first two rows are conditions, and the last two are actions. A *condition row* consists of a number of entries followed by the word **is** and a Cobol condition. An *action row* consists of a series of entries followed by a Cobol statement.

Example:

```
Y Y N N    is A = 0.  
Y N Y N    is B = 0.  
X X - -    Move 0 to C.  
- X X X    Add 1 to C.
```

Type in the Decision table in the text area provided (each line should start with 6 blanks and an asterisk), click on “Generate Cobol” to obtain the Cobol statements of the Decision table.

There is online help provided at:

<http://www.cs.adelaide.edu.au/users/dwyer/COPE-MAN.html#RTFToC1>

Another tool (to be worked online) for program code generation from Decision table can be found at

<http://dtable.projonline.com/Default.aspx>

Note: The tools to convert Decision Tables to Structured English is not available.

IV. SYSTEM REQUIREMENTS SPECIFICATION DOCUMENTATION TOOL

Name of the tool: ARM

URL: The tool can be downloaded without cost at
<http://sw-assurance.gsfc.nasa.gov/disciplines/quality/index.php>

What the tool does: ARM or Automated Requirement Measurement tool aids in writing the System Requirements Specifications right. The user writes the SRS in a text file, the ARM tool scans this file that contains the requirement specifications and gives a report file with the same prefix name as the user's source file and adds an extension of ".arm". This report file contains a category called INCOMPLETE that indicate the words and phrases that are not fully developed.

Requirements to use the tool : PC running Windows 95, 98 or NT. The latest versions of Internet Explorer or Netscape Navigator, and about 8MB of free space.

How to use the tool : On clicking the option Analyze under File menu and selecting the file that contains the System Requirements Specifications, the tool processes the document to check if the specifications are right and generates a ARM report.

The WALKTHROUGH option in the ARM tool assists a user by guiding him as to how to use the tool apart from the HELP menu. The README.doc file downloaded during installation also contains description of the usage of this tool.

V. A TOOL FOR SCREEN DESIGN AND DATA INPUTTING

Name of the tool: Visual Basic

URL: <http://www.microsoft.com/downloads/details.aspx?FamilyID=bf9a24f9-b5c5-48f4-8edd-cdf2d29a79d5&displaylang=en>

What the tool does: This tool is used to create the graphical user interface (GUI) to describe the appearance and location of interface elements, you simply add prebuilt objects into place on screen.

Help: <http://msdn.microsoft.com/library/default.asp?url=/library/en-us/vbcon98/html/vbconpart1visualbasicbasics.asp>

VI A TOOL FOR DESIGNING AND MANIPULATING DECISION TABLES

Name of the tool: Prologa V.5

URL: <http://www.econ.kuleuven.ac.be/prologa>

Note: This tool can be downloaded from the above given URL, after obtaining the password.

What the tool does: The purpose of the tool is to allow the decision maker to construct and manipulate (systems of) decision tables. In this construction process, the features available are automatic table contraction, automatic table optimization, (automatic) decomposition and composition of tables, verification and validation of tables and between tables, visual development, and rule based specification.

References:

1. J.A.Hoffer, J.F.George and J.S.Valacich “Modern Systems Analysis and Design”, Pearson Education Asia, New Delhi, 2002
Chapter 4 “Automated Tools for Systems Development” has a good discussion of CASE tools.
2. G.Booch, J.Rumbaugh, I.Jacobson; “The Unified Modelling Language User Guide”, Addison Wesley, Reading, MA, USA, KGG authentic Introduction to Rational Commercial tools for Object oriented modelling
3. URL's of various available CASE tools
 - (a) System flowchart and Er-diagram generation tool: Smartdraw
<http://www.smartdraw.com>
 - (b) Data flow diagram tool: IBMS/DFD
<http://viu.eng.rpi.edu>
 - (c) Tool to convert decision table to structured english: COPE
<http://www.cs.adelaide.edu.au/users/dwyer/examples.html>
 - (d) System Requirements Specification documentation tool: ARM
<http://sw-assurance.gsfc.nasa.gov/disciplines/quality/index.php>
 - (e) A tool for screen design and data inputting: Visual Basic
<http://www.microsoft.com/downloads/details.aspx?FamilyID=bf9a24f9-b5c5-48f4-8edd-cdf2d29a79d5&displaylang=en>
 - (f) A tool for creation, manipulation and checking of decision tables: Prologa v.5
<http://www.econ.kuleuven.ac.be/prologa>