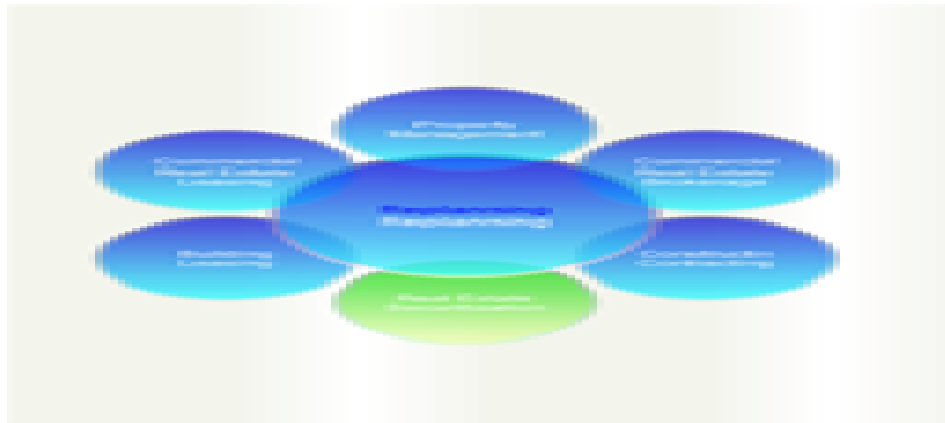
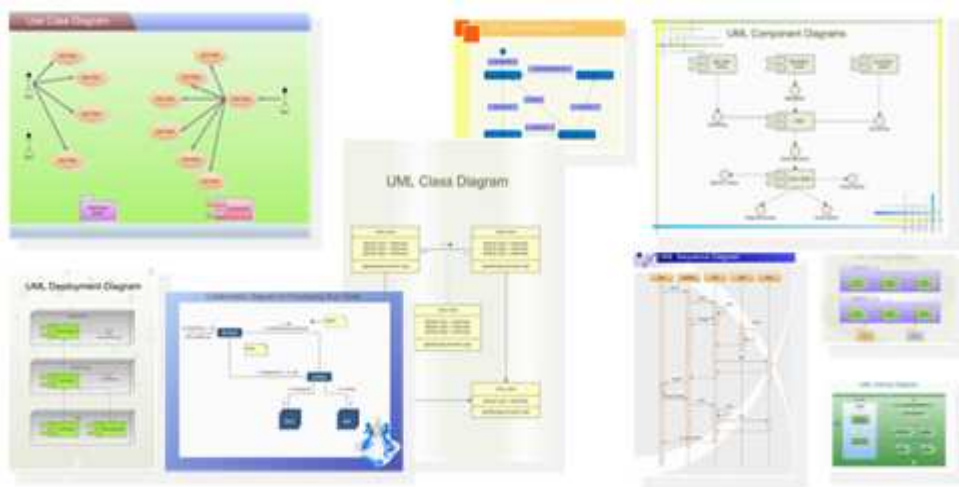


NATIONAL DIPLOMA IN COMPUTER SCIENCE



Introduction to System Analysis & Design

COURSE CODE: COM 125

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WEEK 1 Practical

Objectives:

- The student is expected to get familiar with the SSADM package that will allow him to run the various practicals
- Other methodologies will also be briefly discussed
- The meaning of SSADM, its techniques, logical modeling, data flow modeling, Entity /Event modeling
- Structure of SSADM

Introduction

In the early days of large scale information systems development many organisations used the Cobol programming language together with indexed sequential files to build systems for customer billing, payroll, stock control and a variety of other business areas. Developments at this time were characterised by :-

- limited user involvement;
- inadequate requirements elicitation;
- use of ad hoc analysis and design techniques;
- absence of CASE support for analysis and design;
- time consuming use of 3GL tools;
- inflexible file and 3rd generation database management systems.

Frequently the results of this approach were systems which, on delivery, did not satisfy business requirements. This caused extensive maintenance requirements and thus an increase in the applications backlog. A variety of problems may have caused the mis-match between system functionality and business requirements :-

- a lack of ownership of and commitment to the system from users as a result of the low level of involvement;
- business requirements may have changed between inception and delivery;
- requirements may have been mis-understood;
- inadequate analysis and design tools and techniques may have been used;
- or more likely a combination of these problems.

The response from the information systems community to these problems was the development of structured methodologies for ISE. The purpose of these methodologies seems to have been to (a) formalise the requirements elicitation process to reduce the chances of mis-understanding the requirements

(b) To introduce best practice techniques to the analysis and design process

SSADM (in common with other structured methodologies) adopts a prescriptive approach to information systems development in that it specifies in advance the modules, stages and tasks which have to be carried out, the deliverables to be produced and furthermore the techniques used to produce the deliverables. SSADM adopts the Waterfall model of systems development, (this will be discussed later in other courses) where each phase has to be completed and signed off before subsequent phases can begin. SSADM is one example of a structured methodologies, a variety of others are widely used in ISE, including :

STRADIS: (Structured Analysis, Design and Implementation of Information Systems) a methodology developed by Gane and Sarson (1979). The methodology is based on the philosophy of top down functional decomposition and relies on the use of Data Flow Diagrams.

YSM: (Yourdon Systems Method, Yourdon, 1993). YSM is similar to STRADIS in its use of functional decomposition, however a middle-out approach is adopted and slightly more emphasis is placed on the importance of data structures.

MERISE: (Quang and Chartier-Kastler, 1991) The methodology is widely used in ISE in France, Spain and Switzerland. MERISE consists of three 'cycles', the decision cycle, the life cycle and the abstraction cycle. The abstraction cycle is the key, in this cycle both data and processes are viewed firstly at the conceptual level, then the logical or organisational level and finally at the physical or operational level.

EUROMETHOD: (CCTA, 1994) Euromethod could be described as a framework for the integration of existing European methodologies rather than as a methodology in its own right.

What is SSADM?

SSADM (Structured Systems Analysis and Design Methodology) is a methodology (i.e a system of ways of doing things especially regular and orderly procedures), used in the analysis and design stages of systems development. SSADM does not cover SITP issues or the construction, testing and implementation of software.

"SSADM has been used by in computing since its launch in 1981. In a bid to standardise the many and varied IT projects being developed . Since 1981 SSADM has been further refined and version 4 was launched in 1990. SSADM is an open standard, i.e. it is freely available for use in industry and many companies offer support, training and Case tools for it.

Why is SSADM Used?

Within government departments SSADM has to be used. External contractors producing software for the government also have to use SSADM. SSADM is used by other companies because they expect the use of a disciplined 'engineering approach will eventually improve the quality of the systems they produce. many companies have been willing to incur the considerable expense of implementing SSADM (e.g. staff training) with this expectation in mind.

Major Tools of SSADM?

SSADM revolves around the use of three key techniques, namely

- Logical Data Modeling,
 - Data Flow Modeling
 - Entity/Event Modeling.
- **Logical Data Modeling;** This is the process of identifying, modeling and documenting the data requirements of a business information system. A Logical Data Model consists of a Logical Data Structure (LDS - The SSADM terminology for an Entity-Relationship Model) and the associated documentation. LDS s represent *Entities* (things about which a business needs to record information) and *Relationships* (necessary associations between entities)
 - **Data Flow Modeling;** This is the process of identifying, modeling and documenting how data flows around a business information system. A Data Flow Model consists of a set of integrated Data Flow Diagrams supported by appropriate documentation. DFDs represent *processes* (activities which transform data from one form to another), *data stores* (holding areas for data), *external entities* (things which send data into a system or receive data from a system and finally *data flows* (routes by which data can flow)
 - **Entity Event Modeling;** This is the process of identifying, modeling and documenting the business events which affect each entity and the sequence in which these events occur. An Entity/Event Model consists of a set of Entity Life Histories (one for each entity) and appropriate supporting documentation. [slide 9](#)

Structure of SSADM

SSADM consists of 5 main modules, which are in turn broken down into a complex hierarchy of stages, steps and tasks. [slide 11](#)

1. **Feasibility Study;** Module 1 the feasibility study consists of a single stage (Stage 0 Feasibility), which involves conducting a high level analysis of a business area to determine whether a system can cost effectively support the business requirements. In stage 0 an overview DFD is produced together with a high level LDS. At this stage the DFD will represent the existing system warts and all and the LDS may be incomplete and contain unresolved M:M relationships.
2. **Requirements Analysis;** Module 2 requirements analysis consists of 2 stages;

- Stage 1 Investigation of Current Environment and Stage
- Business System Options (BSO).

During stage 1 the systems requirements are identified and the current business environment is modeled in terms of the processes carried out and the data structures involved. During stage 1 DFDs and an LDS are used to produce detailed logical models of the current system . During stage 2 up to 6 business system options are produced and presented. As a result one of these options (or indeed a hybrid solution) is adopted and refined. During stage 2 DFDs and LDS are produced to support each business system option and the final chosen option. The transition from stage 1 to stage 2 is a key part of SSADM, this is where we move from a logical model of the current system to a logical model of the required system, i.e. this is where the DFDs and LDS have to be refined to cater new/changed requirements.

3. **Requirements Specification;** Module 3 Requirements Specification consists of a single stage (Stage 3 Definition of Requirements) which involves further developing the work carried out in module 2, detailed functional and non-functional requirements are identified and new techniques are introduced to define the required processing and data structures. In stage 3 the DFDs and LDS are refined and cross validated in the light of the chosen business system option. The LDS is enhanced using relational data analysis (normalisation). The DFDs and LDS are validated against the ELHs also produced during this stage. DFDs LDS and ELHs are used as input to the subsequent stages of SSADM.

4. **Logical System Specification;** Module 4 Logical System Specification consists of 2 stages; Stage 4 Technical System Options and Stage 5 Logical Design. In stage 4 up to 6 technical options (specifying the development and implementation environments) are produced, one being selected. In stage 5 the logical design of update and enquiry processing and system dialogues (menus etc.) is carried out.

5. **Physical Design;** Module 5 Physical Design consists of a single stage (Stage 6 Physical Design) in which the logical system specification and technical system specification are used to create a physical database design and a set of program specifications.

WEEK 2 Practicals

This Practical introduces the student to the tutorial sheet of SSADM

Questions are asked and the student is advised to attempt them.

Tutorial Sheet: Introduction to SSADM

Objectives

The objective is to encourage you to view SSADM not as a magic pill which can be swallowed whole or not at all, but as an analysis & design framework or set of tools which can be adopted in whole or in part depending on requirements and which can be modified, tweaked or manipulated by people with sufficient experience and expertise.

Question 1

Of the three main tools of SSADM (LDS, DFD, ELH) which is the most important and why from the point of view of the analyst/designer? Which would be the easiest to understand from the end-users point of view?

Question 2

"When developing information systems the technical environment should be established as soon as possible to avoid any nasty surprises in the later stages of development." Is this a valid statement? If so why within SSADM do technical system options not get considered until the penultimate module.

Question 3

With so many possible implementation environments is there any point having a general physical design module?

Question 4

Why do you suppose ELHs are not used alongside the DFDs and LDS in the requirements analysis phase?

Question 5

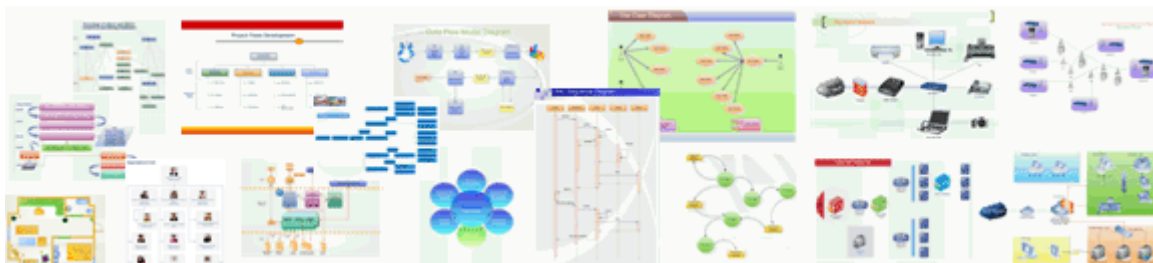
Would SSADM be feasible without the support of CASE tools?

WEEK 3 Practical

Students are introduced here to a basic software that will allow them to create, design and implement various kind of system analysis diagrams using Eldraw Max software

Introduction

Edraw Max enables students, teachers and business professionals to reliably create and publish kinds of diagrams to represent any ideas. It's an all-in-one graphics software that makes it simple to create professional-looking flowcharts, organizational charts, network diagrams, business presentations, building plans, mind maps, fashion designs, UML diagrams, workflows, program structures, web design diagrams, electrical engineering diagrams, directional maps, database diagrams and more. [Screenshot](#)



Create flowcharts, organizational charts, network diagrams with minimum time loss!

With large pre-drawn libraries and more than 4600 vector symbols, drawing couldn't be easier! Edraw Max lets you create a wide range of diagrams using templates, shapes, and drawing tools while working in an intuitive and familiar Office-style environment.

Edraw provides you a versatile, easy, quick and professional solution to let you enjoy your working.

Why have we Chosen Edraw Max ?

1. Uses the diagramming software that best maps to what you know and where you're headed.

2. Is Fully vector-based graphic software, which facilitates the rapid creation of flowcharts, organizational charts, network diagrams and more.
3. Supports to import the exist Visio XML file perfectly.
4. Just drag the build-in shapes from the library pane and drop them on your page. Drawing couldn't be easier!
5. Creates professional-looking diagrams quickly with themes, effects and quick styles.
6. Gains greater productivity in diagramming with features like automatically aligns and arranges all shapes.
7. Includes lots of high-quality shapes, examples and templates.
8. Distinct colors, fonts, shapes, styles, pictures, text, and symbols are available for each diagram object.
9. Easily visualizes complex information with a wide range of diagrams. Make those diagrams even smarter and more useful by linking them to underlying data, which provides a more complete picture of the system or process.
10. Works with MS Office well. It can be integrated with Microsoft Office application easily. The UI is MS Office-style like, it's easy to learn and use. If you are familiar with MS Office, you are familiar with Edraw quickly.
11. Generics graphic formats support and WYSIWYG printing.

Additional Features

- The UI is MS Office 2007 style like. Full ribbon features.
- Added Themes, Color Themes, Effects and Fonts. Easy to change the whole diagram by changing the active theme. With the new Theme feature, you can format the colors and effects in an entire diagram with a single click.
- Real-time previews. When you scroll over the various galleries in Edraw, you'll see your drawings and various objects change to display what they'll look like if you decide to apply those settings. Just click on the thumbnail in the gallery to actually accept the changes. This makes it a lot faster to see, for example, how changing a color scheme will affect your drawings.
- Quick layouts and quick styles. These provide quick formatting options for the object in question, and make it easy to create good-looking slides with just a few clicks.

- Put Edraw graphics into Word, Excel, PowerPoint with one-click buttons.
- Text objects supported line space, bullet, Indent, back color, super script, sub script and more.
- Shadows in general are so very nice compared to those in previous versions. We can actually control the transparency, amount of blur, and color now.
- Shape and text presets make it really easy to apply a preset look to an object or text.
- It's quicker to zoom in and out now using the zoom slider in the southeast corner of the screen.
- Table support.
- Recolor picture, Light and Contrast, transparent PNG support.
- Opened the Shape Sheet for senior users to create more complicated shapes.
- More 2000 clip arts.
- Improved the Insert Hyperlink function.
- Improved the Print function. Support more page sizes such as A0, A1. You can also print the large size graphics in separate pages.
- Persistent undo and redo.
- High quality graphic export.

Vector-based

Edraw Max is a vector-based diagramming software, which means whatever size you change the diagram, it will always keep high quality.

Easy and friendly UI

Edraw UI is MS Office-style like, it's easy to learn and use. If you are familiar with MS Office, you are familiar with Edraw quickly.

Work with MS Office well

Edraw provides several ways to cooperate with MS Office system.

You can copy the selected shapes then paste it into MS Office document.

You can insert the Edraw OLE object in MS Office application.

You also can export the drawings to generic graphic formats such as jpg, tif, bmp. Then switch to MS Office and insert the picture.

Support almost all kinds of graphics formats

Supports almost all the generic graphics formats, it can export or import those common graphics formats, like bmp, gif, dib, png, tif, wmf, emf, html and so on.

Save as exe file and share it with anyone without Edraw

You can save your drawing file to exe format and share it with anyone you want, even it has no Edraw installed.

Provide drawing tools like Illustrator

Provides a set of drawing tools like Adobe Illustrator, with those tools you can draw your own shapes or change the shapes in library.

Distribute shapes automatically

Edraw can help you align and arrange all shapes automatically, this will speed your working.

Strong style system and plenty of beautiful build-in styles

Edraw has an easy and quick style system, and provides a lot of pre-defined styles, which can help you make your diagram beautiful and personal in short time.

Abundant libraries and templates involving kinds of fields

Provide abundant libraries and templates include flowcharts, organizational charts, build plans, network diagrams and more.

Define and manage your own libraries and templates

You can draw your own shapes and documents save as libraries and templates, and use them as pre-defined libraries and templates.

Edraw System requirements

- Windows® 2000, Windows® XP Tablet PC, Windows® XP, Windows 2003, Windows Vista
- 256 MB of RAM, 20 MB of hard disk space
- Pentium® III, 750MHz processor
- 1,024 x 768 or better monitor resolution
- Mouse and keyboard

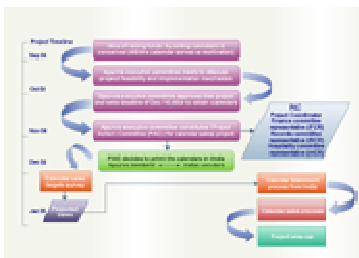
WEEK 4 Practical

After few explanations by the teacher, the student is required to understand the following flow charts:

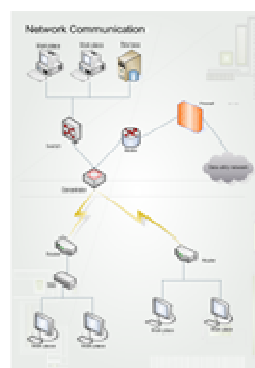
Perfect Flowchart Examples!



Basic Flowchart



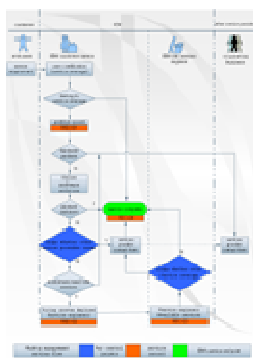
Business Process Diagram



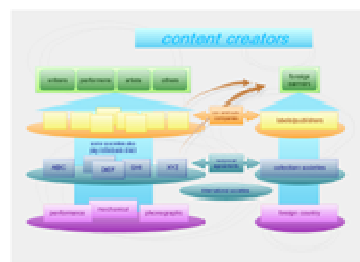
Network Diagram



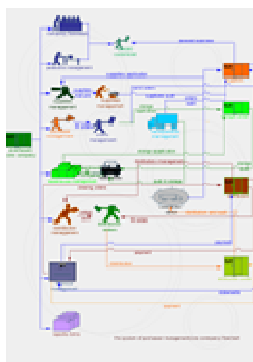
Data Flow Diagram



Work Flow



Business Chart



Planning Diagram

Sales Flowchart

Cause & Effect Diagram

Here the student is expected to practice the following:

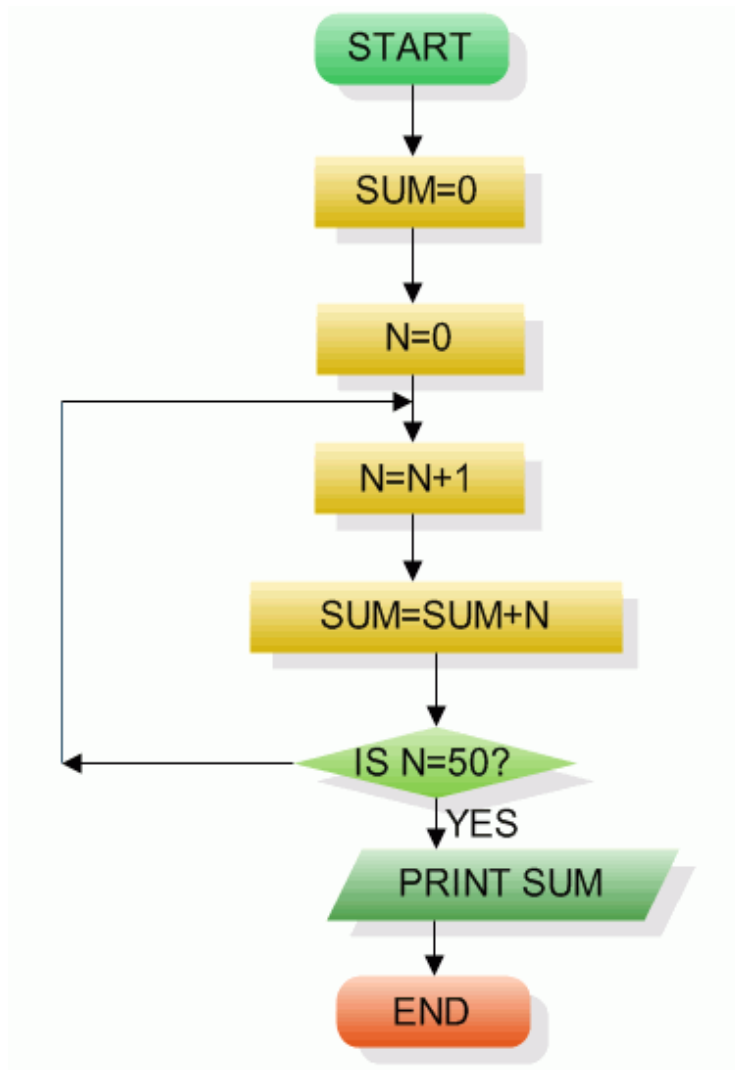


Fig. Sum of first 50 natural numbers

Flow Chart Example 2

Draw a flowchart to find the largest of three numbers A, B, and C.

Answer: The required flowchart is shown in Fig 2

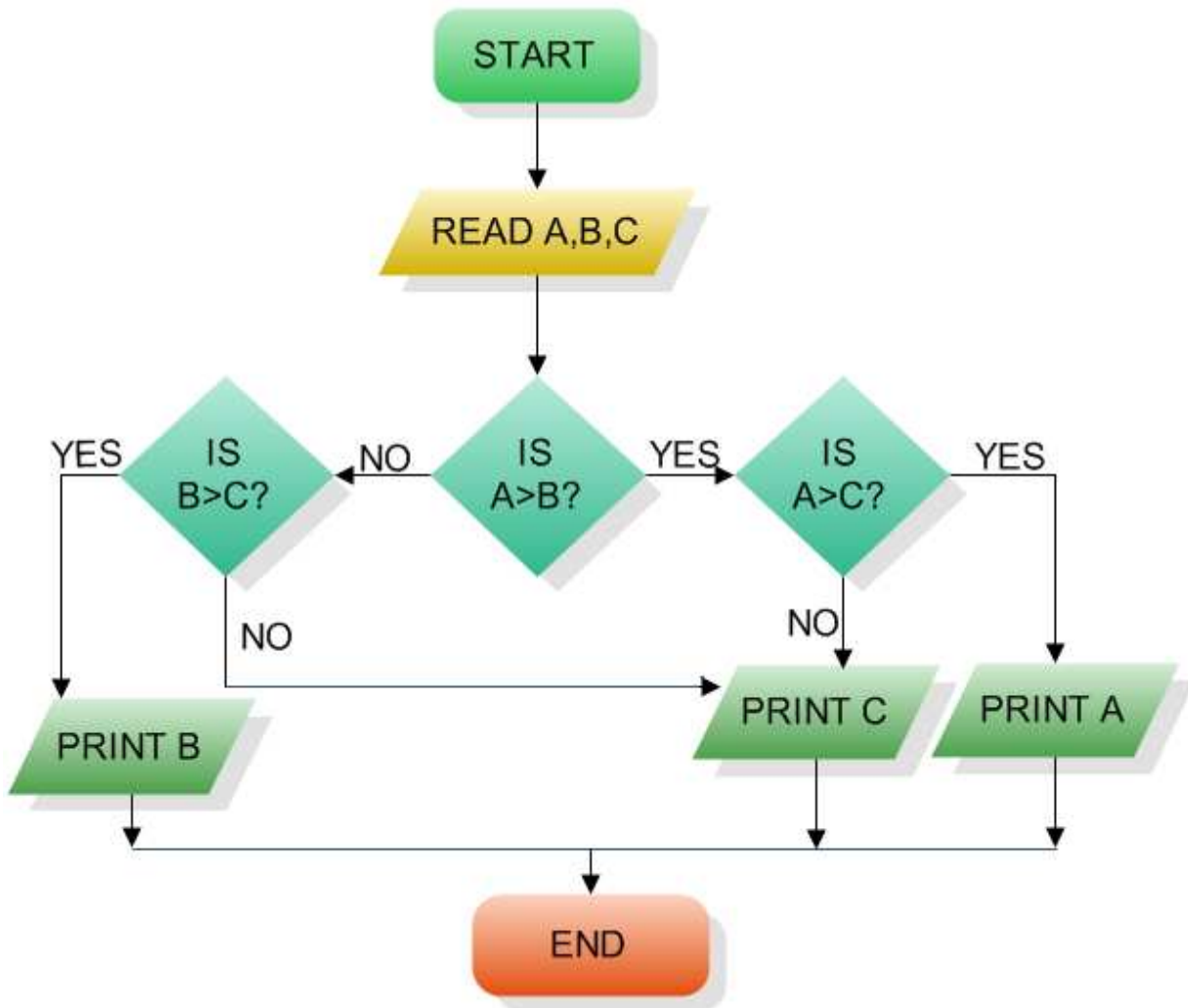


Fig : Flowchart for finding out the largest of three number

Flowchart Example 3

Draw a flowchart for computing factorial N ($N!$)

Where $N! = 1 \times 2 \times 3 \times \dots \times N$.

The required flowchart has been shown in fig 3

Answer:

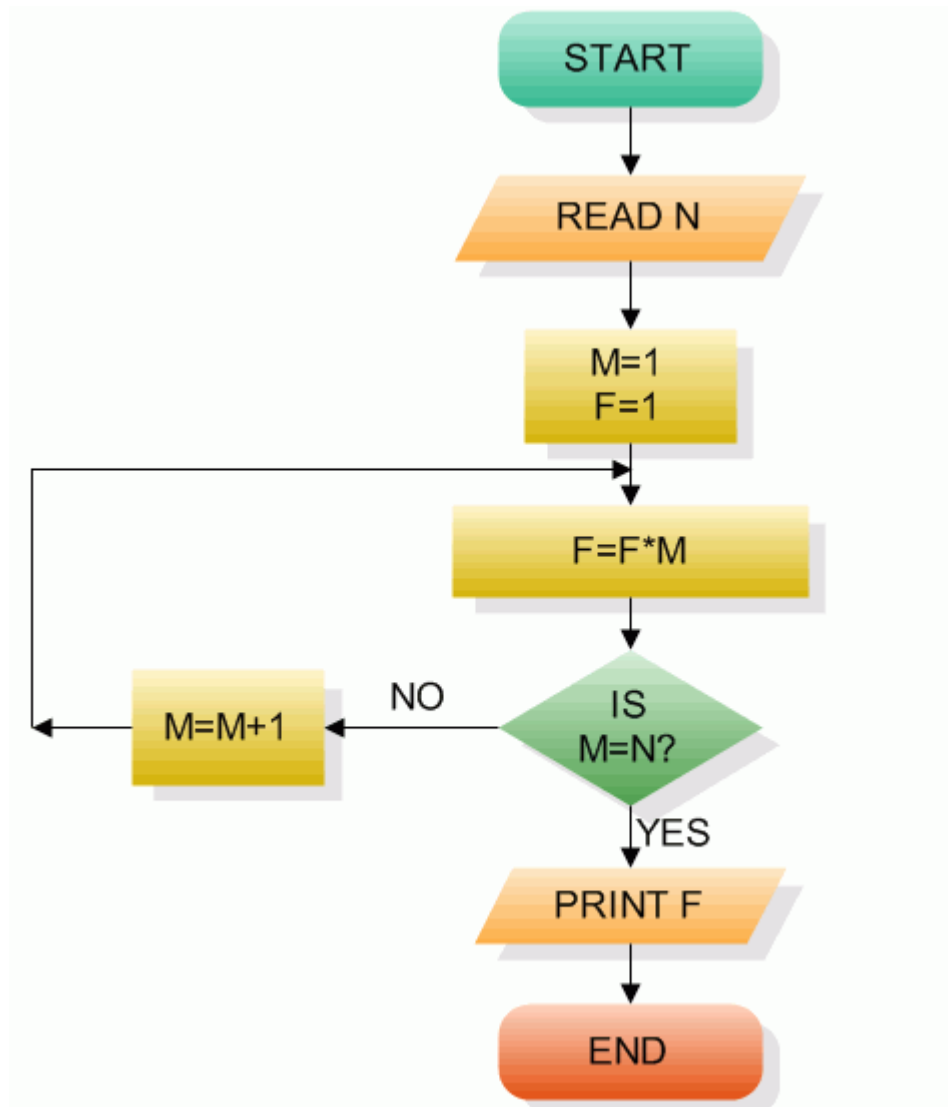


Fig 3 Flowchart for computing factorial N

WEEK 5 Practicals

In continuation of the flow chart familiarization and drawing, the student is expected to practice the following:

Understand the problem below and try to design a flow chart for it

A product assembly team in a gaming machine manufacturer were looking for ways of building the product more efficiently. They broke down the assembly process into a set of Flowcharts, showing how sub-assemblies were made and then built into the final product. Analysis of the reel assembly process revealed two improvements:

1. The kit of parts was already checked by the kit assembly line, who were sometimes careless, as they knew the kit would be rechecked. The assembly line process was improved so the check here could be removed. This saved over two minutes per reel in checking, and up to fifteen minutes when the kit was faulty.
2. Fitting the reel band after the reel had been attached to the base was awkward. Fitting the band before the reel was attached to the base was more comfortable and saved about a minute per reel.

Draw the process Flowcharts, before and after improvement

This flow chart is shown below and must be practiced by the students

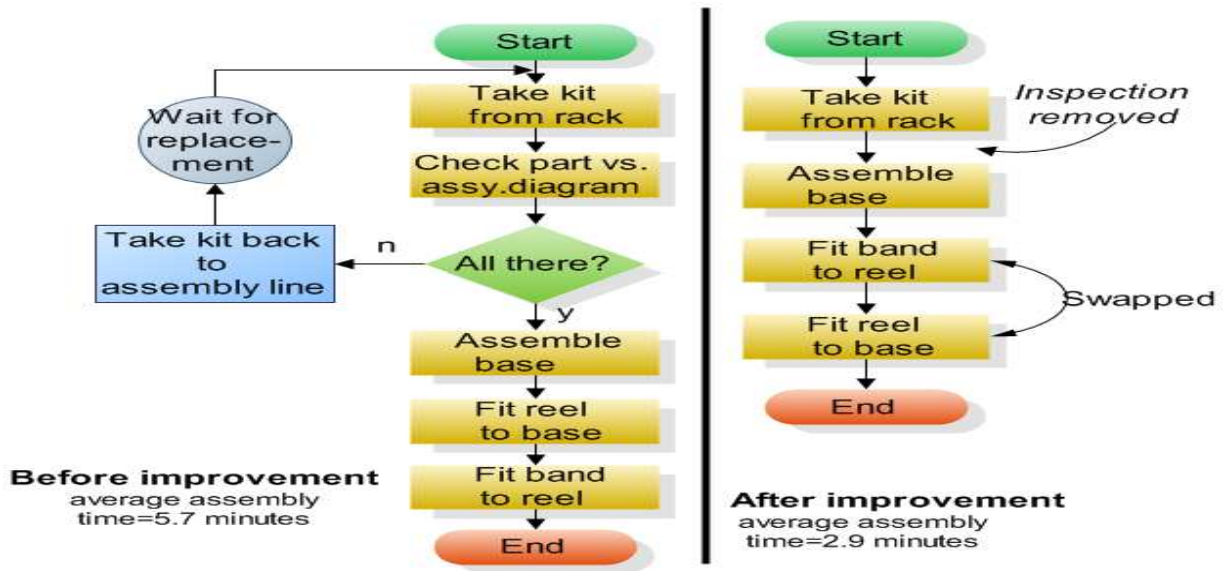


Fig Flowchart for gaming machine manufacturer

WEEK 6 – 8 PRACTICALS

The student is expected to study and understand the following example of an Organisational Chart and attempt the tutorial thereafter.

Example of Organizational Chart

Recommend a new flowchart software similar to Visio, Support flowcharts, organizational charts, business charts, UML diagrams, database & ERD, directional map and network diagrams. Easy-to-use drawing tools, many pre-drawn flowchart templates, more than 2000 symbols and examples, create flowcharts and business diagrams with minimum time loss.

How to make an organizational chart? How indeed does one go about it, without seeing and **example of organizational charts**? Except one has a good **example of an organization chart** it may be difficult to grab it.

With **Edraw Organizational Chart**, you can create clear and comprehensive organizational charts with no prior experience. As you can see by studying the examples of organizational chart

below, these types of charts are the ideal way to illustrate the inner structure and hierarchy of a business or any other type of organization.

Nothing is left unclear when structural relationships are illustrated with an organizational chart created with Edraw - the ultimate organizational chart software. Use it to create Organizational charts, visualize company organizational chart, business organizational chart, bank organizational chart, corporate organizational chart school organizational chart and government organizational chart simples etc.

Perfect Organizational Chart Examples



Business Organizational Chart



Photo Organizational Chart



Company Organization Chart



City Organizational Chart



Market Organizational Chart



IT Organizational Chart



Corporate Organizational Chart



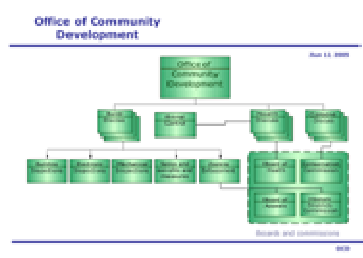
Human Resource Org Chart



School Organizational Chart



Financial Organizational Chart



Team Organizational Chart



Police Organizational Chart



Hospital Organizational Chart

Organizational Chart Tutorial

Using Edraw to Create Organizational Charts

The tutorial explain how to create organizational charts using Edraw. The easiest way to draw a new organizational chart based on the Edraw organization chart templates and examples.

What does Edraw Organizational Chart do?

Edraw Org Chart is an organizational Chart diagramming program that can help you create business and technical diagrams that document and organize complex ideas, processes, and systems.

Interface

Edraw's toolbars contain buttons you can use to issue commonly used commands. To find out what each button does, float your mouse pointer over (do not click) the button.

- Edraw Screenshot
- Organizational Chart Templates
- Organizational Chart Examples

Creating the Organization Chart

You can open the organizational chart template for the library menu. It includes Frame Shapes, Card Shapes, Photo Shapes, People Shapes and Custom Shapes. Library > Organizational Chart > Frame Shapes

Drag the Executive icon to your chart. After you create the new drawing, create the organization chart by dragging

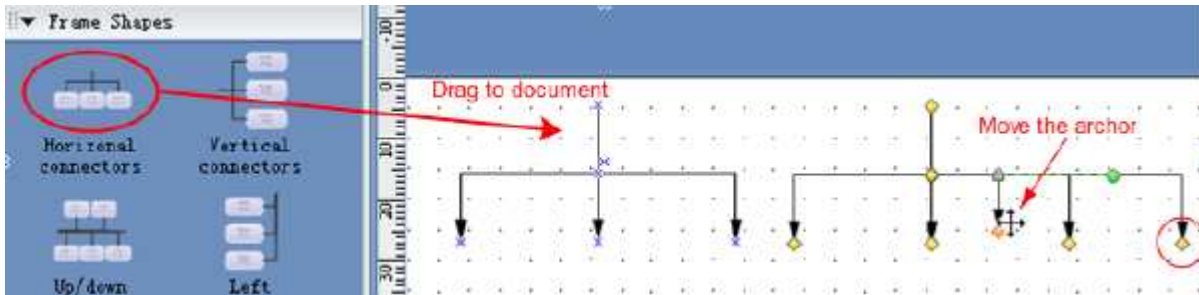
shapes from the stencil to the drawing page. An organization chart shape contains the name and title of the person represented by the shape.

Organization Chart Shapes

- Single Entries
- Executive - highest position
- Manager - box is similar to Executive but smaller, double lines
- Position - single line box
- Consultant - box with dashed lines
- Vacancy - box with dotted lines
- Assistant - dark single line that typically goes to the right of the Executive or manager box

Adding Multiple Shapes

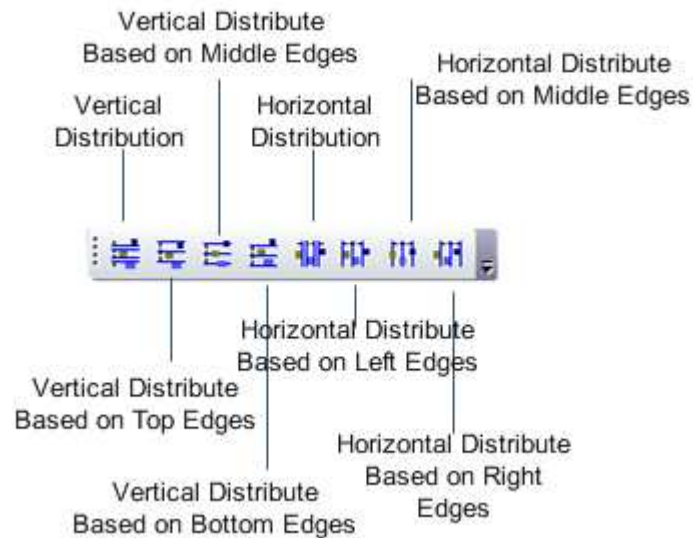
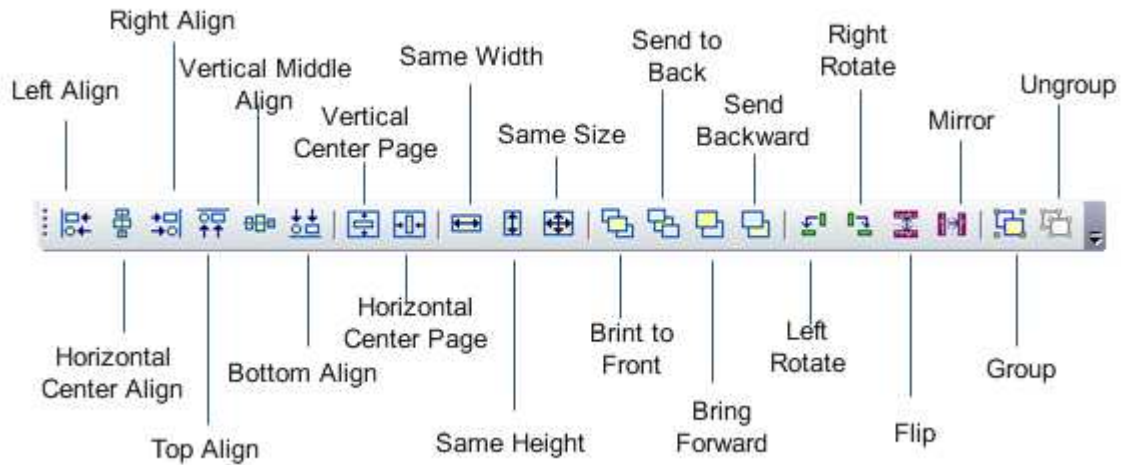
You can add more than one shape of the same type to your organization chart. For example, you might need five Manager shapes under an executive shape. You can insert all the Manager shapes by dragging the Multiple Shapes shape over the Executive shape. When you do this, the Add Multiple Shapes dialog box appears in which you specify the number and type of shapes to be inserted.



In Edraw, users create org charts by starting at the top and moving to the bottom. So the first shape added usually represents an executive. However, the topmost shape could represent a manager or project leader if the user is creating an org chart for a single department or team.

Modify Layout Options

You can use the follow two toolbars to layout shapes easily. You can also use the automation align function while you dragging.



Edit Text

Very many pre-defined shapes have multiple text boxes. You can click the text region to edit every one. You can use the "Text Block Tool" to change their position too. See [how to edit text](#).

Replace Image

All the images in the Photo Shapes can be replace with a local image file. Firstly select a photo shape then click the "Replace Photo" item in the context menu.

WEEK 9 Practical

The student is expected here to create his own organizational chart shapes and draw them.

Create your own Organizational Chart Shapes

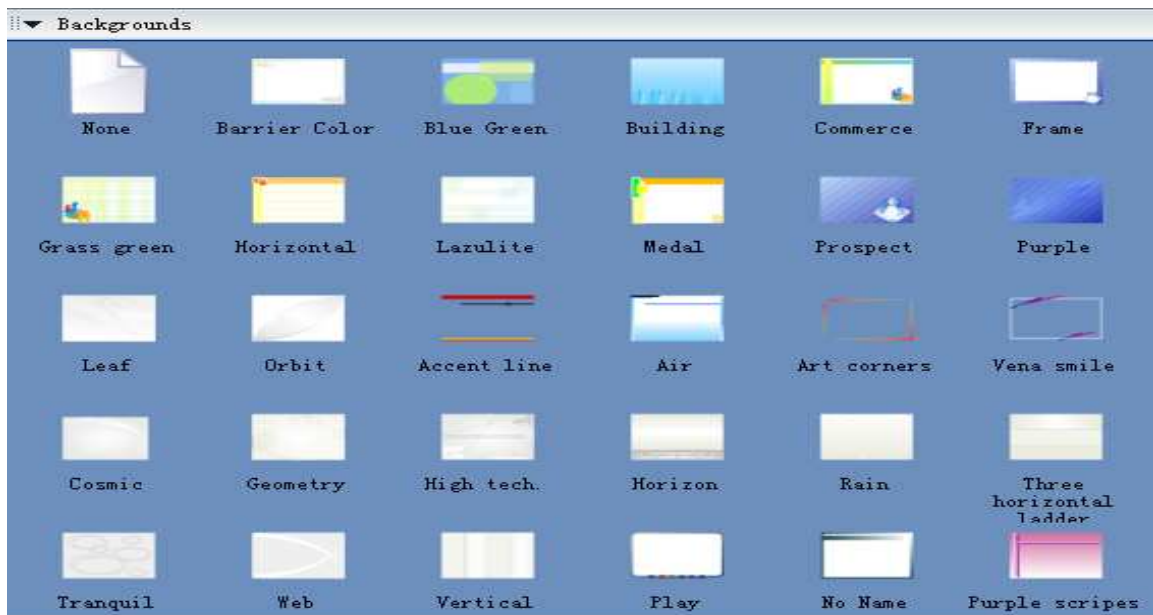
Edraw provide some easy to use drawing tools. Include line, arc, curve, freeform, rectangle and ellipse. You can create any shapes with these tools. See [How to create basic shapes](#).

Adding a Fill Color

First click on the shape you would like to format, making sure that the green formatting handles appear around it. Click the Format > Fill Menu. [Detail](#). Or you can use [style](#) and [color scheme](#) to fill shapes.

Add the Background

Drag the pre-defined background into drawing. Library > Basic Shapes > Background



Printing Organization Charts

Edraw is a free printable organization charts software.

[Organizational charts](#) may not always fit neatly onto the standard 8 1/2 by 11 sheet. File > Page setup

Insert Edraw file into Microsoft file

Open Microsoft Word file.

Insert > Object

Select Create from File tab.

Click Browse button and select the Edraw file. (file has edx extension)

How to Create Organizational Charts

Organizational charts

An organizational chart provides a tool for evaluating titles and functions within an organization or business.

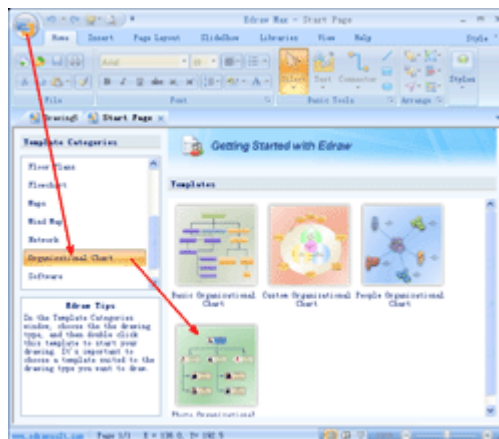
An organization chart (org chart) is a diagram of a reporting hierarchy that is commonly used to show relationships among employees, titles, and groups.

Org charts can range from simple diagrams, as in the following illustration, to large and complex diagrams that are based on information from an external data source. The shapes in your org chart can display basic information such as name and title, or details such as department and cost center. You can even add pictures to the org chart shapes.

Create an Organizational Chart

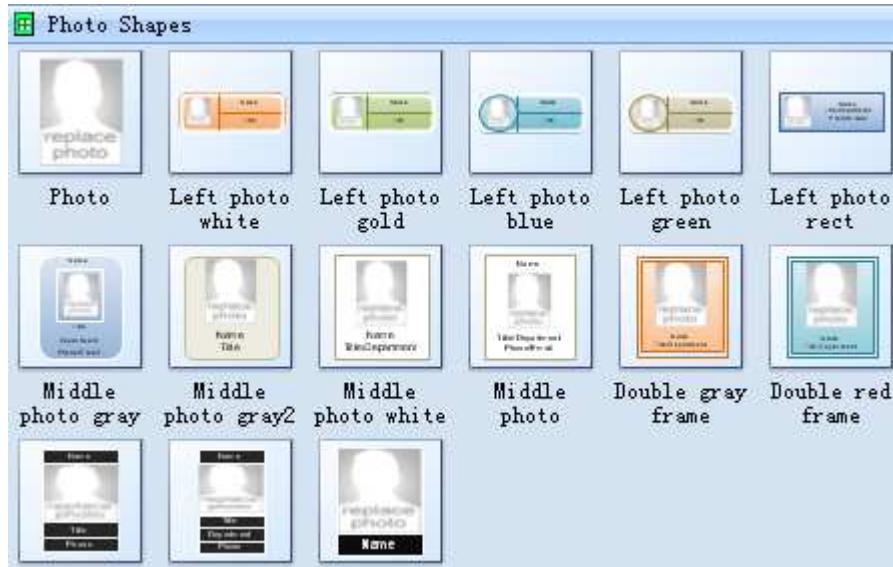
Open Edraw. When Edraw opens, all you need to work with is the one titled Template Categories. (Tips: If you already have Edraw open, on the Edraw Main Button, point to New, and then click Choose Drawing Types....)

In the Template Categories list, click the **Organizational Chart** category. All of the libraries in the organizational chart category appear in the central window.



Double-click the template titled **Photo Organizational Chart**.

When the Organizational Chart Shapes library opens, most of the space is taken up with a blank drawing page. Because it is important to line up the shapes when you create a diagram, the page appears with grid lines on it.

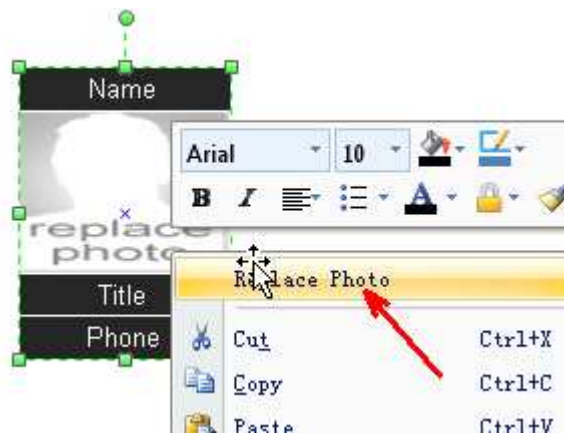


Traditionally, organizational charts were drawn with a template and a ruler. Now, however, the process is made much easier with Edraw.

How to replace photo in the Organizational Chart Shapes

Including pictures of employees in your organization charts can help to humanize your corporate intranet site, help new employees get acquainted, and assist far-flung virtual teams to get a sense of who their co-workers are. Using the improved organization chart shapes in Edraw, you can easily add pictures to your organizational charts.

Right-click the organization chart shape you want to add a picture to, and then click **Replace Photo**. In the Insert Picture dialog box, locate the folder that contains the picture you want to insert, and then click the picture file.



Connect Organizational Charts Shapes with the Smart Connector

It's easy to connect organizational chart shapes in Edraw. On the **Home** tab, in the **Basic Tools** group, click the **Connector** tool.

To create a smart connector you need to point the cursor at any connection point of the shape. The connection point will be highlighted red.

How to Draw Organizational Charts

Even as you create an up-to-the-minute organization chart today, you know it will be obsolete tomorrow. But you can set up your organization charts so they are fast and easy to revise.



You can also turn organization charts into dynamic communication and management tools by storing data in the shapes, such as department or telephone number, or even protected confidential information about employees, such as salary or start date, behind the scenes.

To create an organization chart

From the **Organization Chart Shapes** stencil, drag the shape onto the drawing page. Any shapes can be Executive or Manager or Staff. Double click to edit the name.

Link your organizational charts together

It's easy to add hyperlinks to the shapes and pages in your diagrams. The hyperlinks can go to:

- Another page in the same Edraw drawing.
- A page or shape in another Edraw drawing.
- A document other than a Edraw drawing.

- A Web site.

For network design and documentation, linking a shape or page in one Edraw drawing to a shape or page in another Edraw drawing is an ideal way to reduce complexity.

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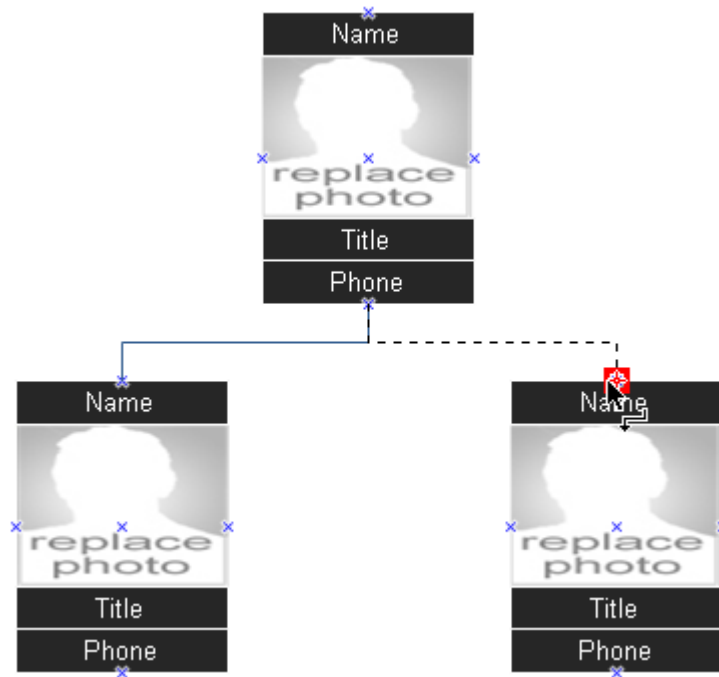
1. Make sure that both the file you're linking from and the file you're linking to have been saved.
2. If you're creating a link to a specific shape, make a note of the shape id and the name of the page that the shape is on.
 - To find a shape id, click the shape to select it, and then the shape id will appear on the statute bar at bottom of the window.
 - To find the page name, locate the tab for the page at the bottom of the drawing window.
3. Select the shape to add a hyperlink.
4. On the **Insert** menu, click **Hyperlinks**.
5. In the **Address** box, click **Browse**, and navigate to the file you want, and then click **Open**.

If you don't see the file you want, try changing the **Files of type** list.

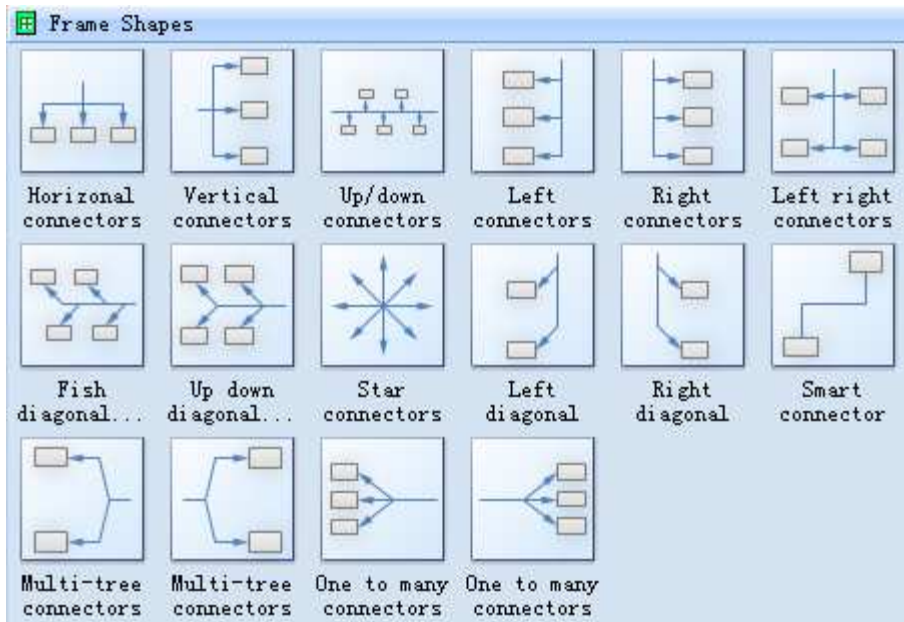
6. To link to a specific page or a specific shape on a page, or to choose a zoom level, click **Browse** next to **Sub-address**.
 - Do any of the following:
 - To link to a specific page, select the page name in the **Page** box.
 - To link to a specific shape, first select the page name on which the shape appears in the **Page** box, and then type the id of the shape in the **Shape** box.
 - To specify a zoom level, type a percentage in the **Zoom** box, or click the arrow to select a zoom level.

Note You can use the zoom level to show more or less detail of the drawing. Use a low number to show more detail of a smaller area of the drawing or a high number to show less detail of a larger area of the drawing.

 - Click **OK**.
7. In the **Description** box, type a name for the link. This text will appear when the pointer rests over the link in the drawing.
8. To create a Web link, type the web address in **Address** box.
9. To add another hyperlink to the page or selected shape, click **New**, and then repeat steps 5 through 8.
10. Click **OK**.



Or you can open the Frame Shapes in the Organizational Chart Category.



The design of your organizational chart is dependent on the type of organization. Some organizations are described as "flat," meaning that many people report to a single person at the top of the organization. Others are more vertical in nature with a few people reporting to the top. In some organizations, departments or organizational units are similar in size; in others, there is considerable disparity in the size of the various organizations. Design of your organizational chart is made more difficult if there is a great deal of variation from department to department.

Organizational charts can list both titles and names of specific personnel. In a large organization, they may simply list

the title with the number of people assigned to that title in that department. For example, under computer department, you might see the following functions: Software Engineers (25), System Administrator (2), Computer Support Specialist (12). If names are required, they can be listed separately by department and function.

Organizational Chart Examples

The follow images was create with the Edraw org chart software. You can find more examples in the example gallery.



City Organizational Chart



Market Organizational Chart



IT Organizational Chart

WEEK 10 Practicals

The student is given a small organizational problem and is required to draw a chart for it.

Problem:

Let's make a sample organizational chart for a small organization. Let's imagine a small manufacturing company, Kaduna Rubber Shoes (KRS) for the Coordination Challenged. KRC has twenty-five people on its staff.

At the top of KRS's hierarchy are the President and Chief Operation Officer. The president has an Administrative Assistant who reports only to him. Place a box to one side of the President's box, but make it smaller than that of the President. On a piece of paper or on your computer screen laid out horizontally (landscape) place a box with his/her title, followed by his/her name or the number one. Two vice president report to the president. Add two boxes for Vice Presidents under the President's box and label them "VP of Operations" and "VP of Sales and Marketing, respectively." Production, Quality Control, Shipping, and Receiving report to the VP of Operations. Place a box for each of these departments under the box for VP of Operations. As you might guess, the Sales and Marketing departments report to the VP of Sales and Marketing. Place the name of the supervisor for each department in its box. Note that the Shipping and Receiving, although separate departments with discrete functions, have the same supervisor. Show his/or her name in both boxes. Create a small box for each staff member in each of the departments,

and list his or her name in the box with his/her title. Connect the boxes with lines to show the relationships and to complete the "tree branches".

We've forgotten one person, the company Accountant, who reports to both the President (for accounts payable and receivable) and to the VP of Operations (for purchasing and inventory). Place the accountant's box between the President and VP of Operations and connect him/her to each with a dotted line. Dotted lines are used to show dual reporting structures within an organization. For example, a person may be assigned full-time to a specific department, but have a "dotted line" relationship with another department or organization.

The process is similar for a large organization, but names are not listed on the chart. However, each title will likely show a head count next to the title. Also, any vacancies are specified on the chart.

A very small organization will likely fit on one piece of paper. Other organizations will require oversize (8.5" x 14" or 11" x 17"). To create or print an organizational chart on standard 8.5" x 11" letter size paper, the chart will need to be broken into discrete units, usually divisions (groups of departments) or departments. Typically, the executive positions are listed on the first page of a multi-page chart. Pages should be numbered and the charts should be annotated, similar to the annotation in a map book, to show the chart to which a section connects.

Finally, you can use box size, line weight, and color to show relationships and to make your chart easier to read. The organizational chart is a tool used by both management and staff to document and better understand relationships and functional roles within an organization.

WEEK 11 Practicals

We introduce the student this week to other types of diagram that can be encountered in system analysis and design

How to Create a Network Diagram

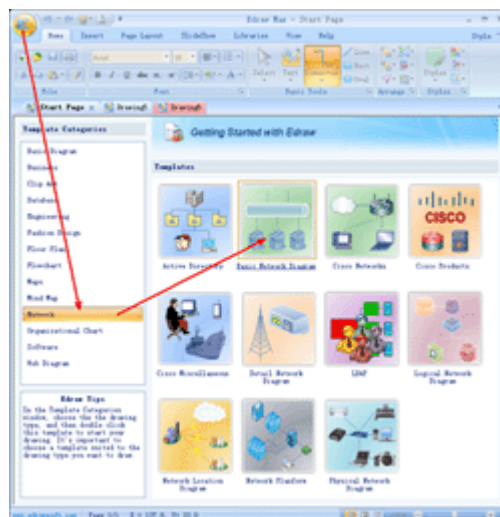
Basic Network Diagram

Basic network diagrams show the primary pieces of your network and how those pieces are connected. This article describes how to quickly create a basic network diagram in Edraw Max. If you have Edraw installed, you can create a more detailed network diagram by using the Detailed Network Diagram template. The difference between the basic and detailed network diagram templates is that the Detailed Network Diagram template comes with more network symbols.

Create a Basic Network Diagram

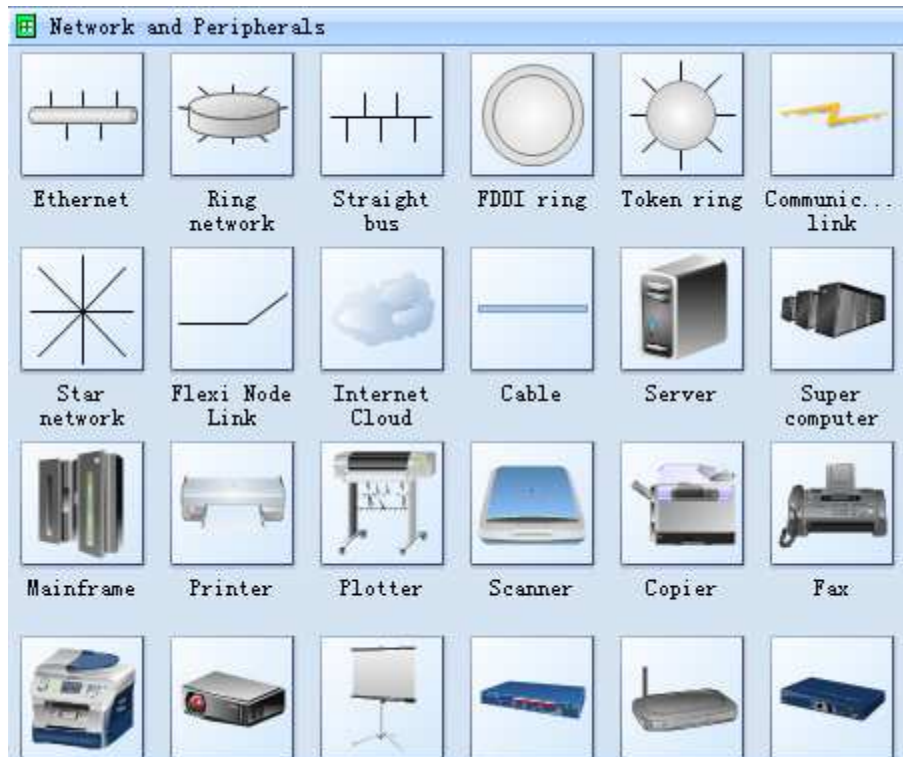
Open Edraw. When Edraw opens, all you need to work with is the one titled Template Categories. (Tips: If you already have Edraw open, on the Edraw Main Button, point to New, and then click Choose Drawing Types....)

In the Template Categories list, click the **Network Diagram** category. All of the libraries in the network diagram category appear in the central window.



Double-click the template titled **Basic Network Diagram**.

When the network diagram shapes library opens, most of the space is taken up with a blank drawing page. Because it is important to line up the shapes when you create a diagram, the page appears with grid lines on it.

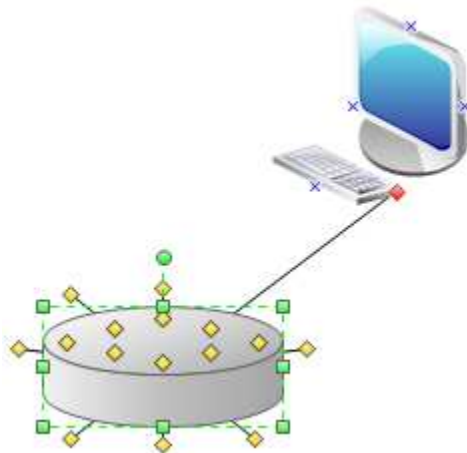


Connect Network Diagram Shapes with the Smart Connector

It's easy to connect organizational chart shapes in Edraw.

On the **Home** tab, in the **Basic Tools** group, click the **Connector** tool.

To create a smart connector you need to point the cursor at any connection point of the shape. The connection point will be highlighted red.

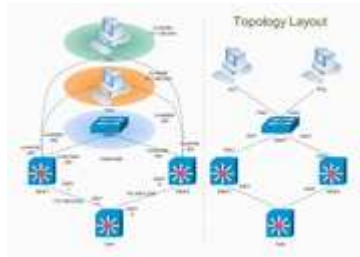


Network Diagram Examples

The follow images was create with the Edraw network diagram software. You can find more examples in the example gallery. The following illustration shows some basic network diagrams.



Home Network Diagram



Cisco Network Design

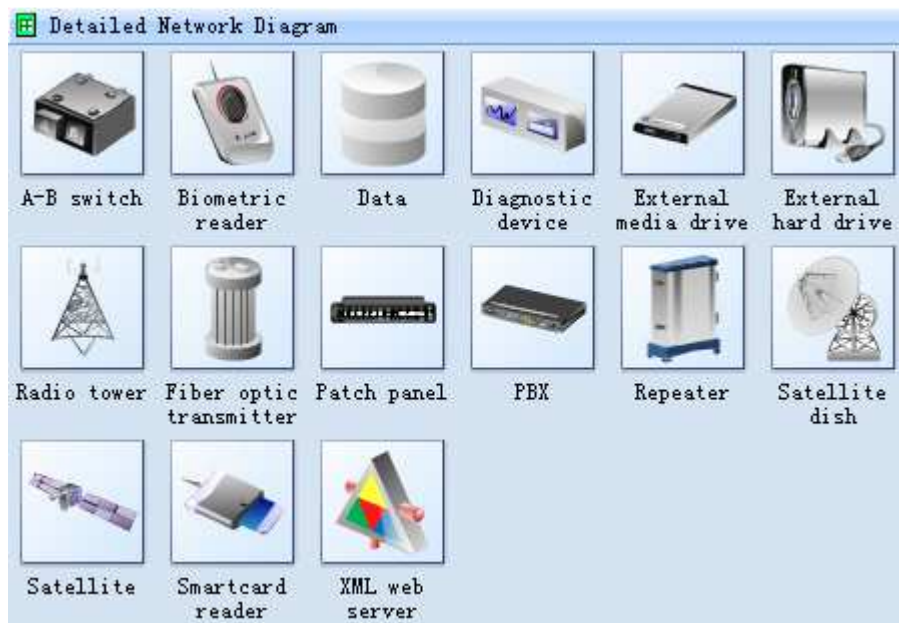


Network Topologies

Create a detailed network diagram

Creating a detailed network diagram with Edraw is an effective way to design and document a computer network, as in the following illustration.

Using the Detailed Network Diagram template and the data Link features, you can create a diagram that shows how equipment is logically or physically connected, add initial data to identify each shape, and then import and link external data to your network shapes.



Network Diagram Examples

How to make an network topology? How indeed does one go about it, without seeing and **examples of Network Diagram**? Unless one has good **Network Diagram examples this may appear difficult**.

We recommend a new network diagram software similar to Visio, Support flowcharts, organizational charts, business charts, UML diagrams, database & ERD, directional map and network diagrams. Easy-to-use drawing tools, many pre-drawn flowchart templates, more than 2000 symbols and examples, create network diagrams and business diagrams with minimum time loss.

With **Edraw Max**, you can create clear and comprehensive network diagrams with no prior experience. As you can see by studying the examples of network diagram below, these types of diagrams are the ideal way to illustrate the network design idea and network relativity.

Diagram a network, draw Computer Network Diagrams, Designs, Schematics, Network Maps with our network diagram tool - Edraw Max in a couple of minutes! Pre-drawn network shapes representing computers, network devices plus smart connectors help design diagram network, create accurate network diagrams and documentation to be used in your network diagram project.

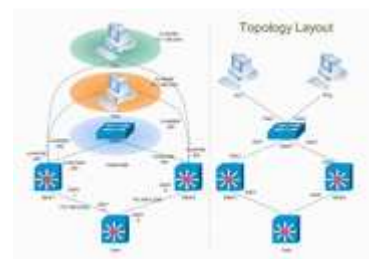
Perfect Network Diagram Examples



Network Diagram



Cisco Network Diagram



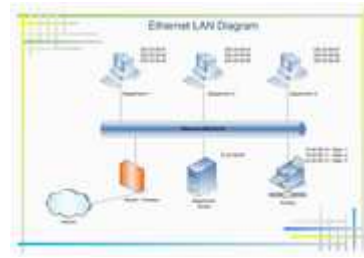
Cisco Topology



Lab Network



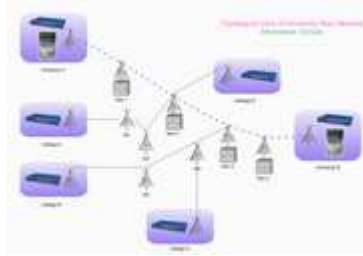
Home Network Diagram



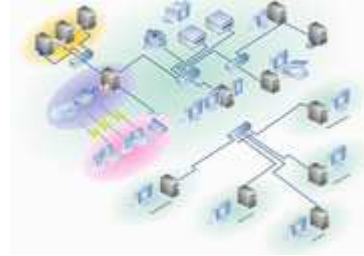
Ethernet LAN Diagram



Campus Network Diagram



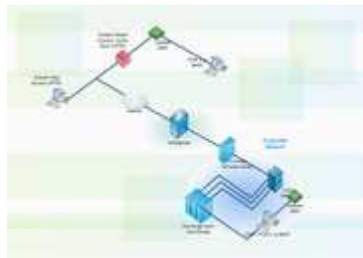
Microwave Topology



Network Platform



Security Network



Outlook Web Access



WAN Diagram



Mobile Network



Wireless Network



Active Directory

WEEK 12 Practicals

More System Analysis Diagrams are introduced

Business Diagram Templates Study each diagram to understand its applications.



Audit Diagram



Basic Flowchart



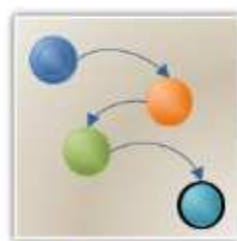
Brainstorming Diagram



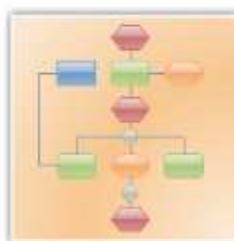
Cause & Effect
(Fishbone)



Charts and Graphs



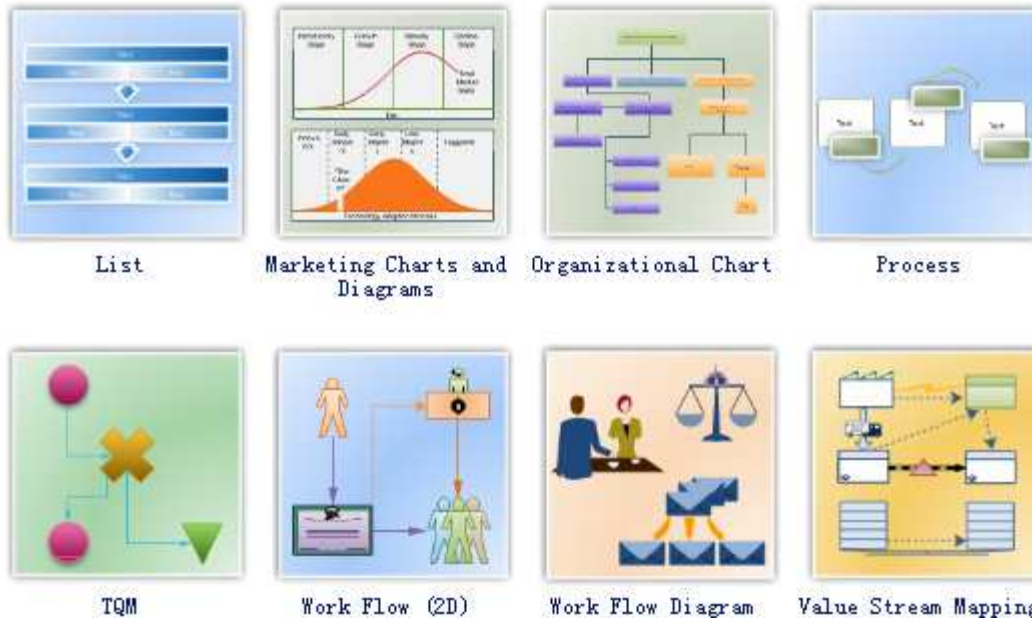
Data Flow Diagram



EPC



Fault Tree Analysis



Edraw is the diagramming tool of choice for business and technical professionals who need to quickly and easily visualize, explore, and communicate information. . You can create a wide range of diagrams such as business process diagrams, work flow diagrams, value stream maps, TQM diagrams, and cause and effect diagrams in a snap.

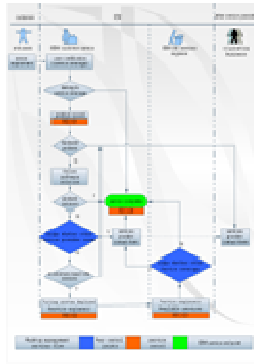
Easily diagram complex processes that conform to particular standards such as Lean or Six Sigma can be obtained. It includes a variety of business process shapes so your diagrams look exactly the way you want. Easily collaborate with colleagues to create detailed process diagrams and use them as a key element in streamlining your processes.

Business Diagram Suite is the most powerful business and relational charting/diagramming package available. You may need to create advanced, completely customizable Flow Charts, Organizational charts and other relational diagrams from your data.

Examples of functionality that business Diagram is perfectly suited for include:

1. Creating Dynamic Organizational Charts
2. Creating Social Network Diagrams
3. Building Flow Charts and Block Charts
4. Diagramming your business processes
5. Decision Charts
6. Much more.

Business Diagram Examples



What are the Benefits of Business Diagram

1. Gain greater understanding of your corporate data, by visualizing business processes and acting on them.
2. Dynamically create advanced, customized Organizational Charts and Diagrams on the web.
3. Visually examine how people, business functions and other items relate to each other.
4. Create custom, reusable objects for rapid application development.
5. With just a few clicks, Edraw can connect, align, and evenly distribute shapes in your business process diagrams. Edraw can automatically connect shapes as you drag, drop, and rearrange them onto the drawing page, or connect existing shapes that are already on the drawing page.

Works in the following fields

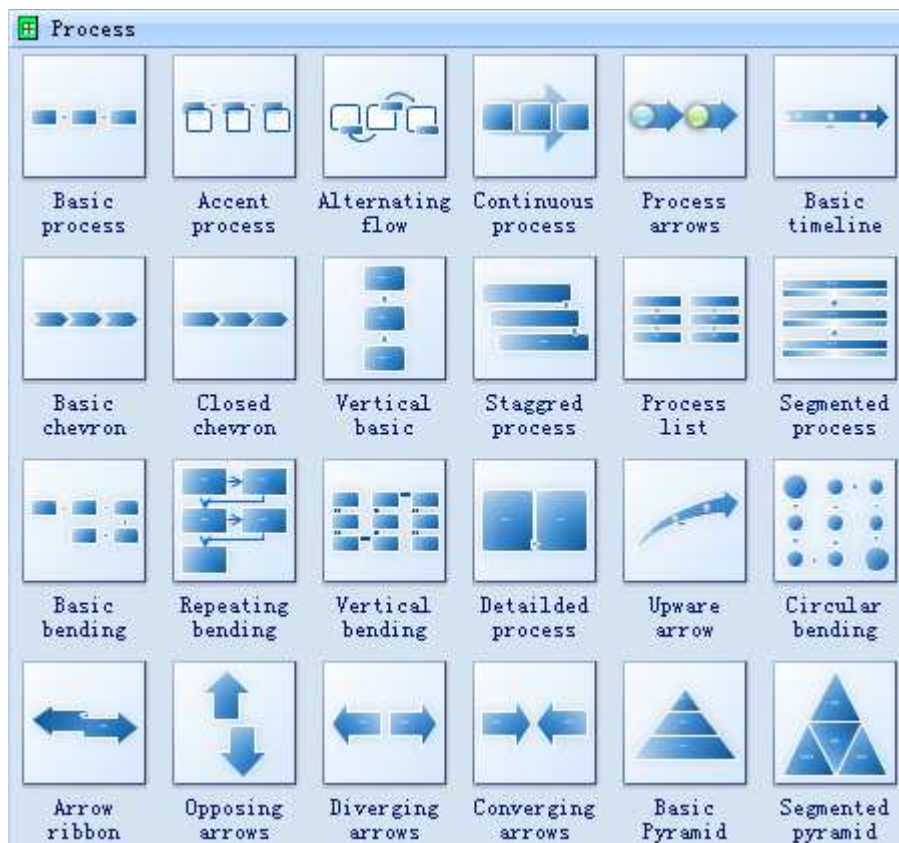
- Basic Flowchart, Data Flowchart, IDEF0 Flowchart, SWOT Diagram and SDL Diagram.
- Business Chart, Audit Flow Diagrams Cause and Effect Diagram, EPC Diagram, Fault Tree Analysis, TQM Diagram.
- Organizational chart.
- Human Resource Diagram
- Workflow Diagram
- 2D, 3D Shapes, Arrow and Connector lines, Annotations, Borders and Titles, Background.
- Network Design Diagram.

WEEK 13 - 14 Practicals

Business Process Drawings

Build-in Shapes for Draw Process

Only drag these lists to your drawing and it's easy to change the theme color and style.



Process List

Use to show multiple groups of information or steps and sub-steps in a task, process, or workflow. Level 1 text corresponds to the top horizontal shapes, and Level 2 text corresponds to vertical sub-steps under each related top-level shape.

Accent Process



Use to show a progression, a timeline, or sequential steps in a task, process, or workflow. Works well for illustrating both Level 1 and Level 2 text.

Basic Bending Process

Use to show a progression or sequential steps in a task, process, or workflow. Maximizes both horizontal and vertical display space for shapes.

Basic Chevron Process

Use to show a progression; a timeline; sequential steps in a task, process, or workflow; or to emphasize movement or direction. Level 1 text appears inside an arrow shape while Level 2 text appears below the arrow shapes.

Basic Process

Use to show a progression or sequential steps in a task, process, or workflow.

Circular Bending Process

Use to show a long or non-linear sequence or steps in a task, process, or workflow. Works best with Level 1 text only. Maximizes both horizontal and vertical display space for shapes.

Closed Chevron Process

Use to show a progression, a timeline, or sequential steps in a task, process, or workflow, or to emphasize movement or direction. Can be used to emphasize information in the starting shape. Works best with Level 1 text only.

Continuous Arrow Process

Use to show a timeline or sequential steps in a task, process, or workflow. Works best with Level 1 text because each line of Level 1 text appears inside the arrow shape. Level 2 text appears outside the arrow shape.

Continuous Block Process

Use to show a progression or sequential steps in a task, process, or workflow. Works best with minimal Level 1 and Level 2 text.

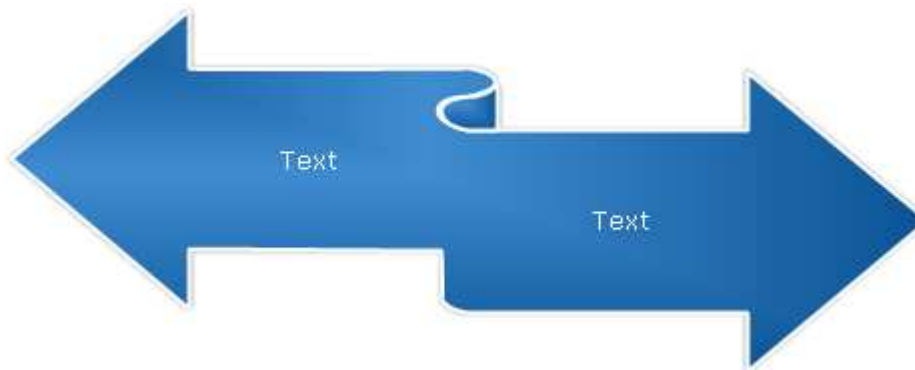
Detailed Process

Use with large amounts of Level 2 text to show a progression through stages.

Process Arrows

Use to show information illustrating a process or workflow. Level 1 text appears in the circular shapes and Level 2 text appears in the arrow shapes. Works best for minimal text and to emphasize movement or direction.

Ribbon Arrow



Use to show either related or contrasting concepts with some connection, such as opposing forces. The first two lines of Level 1 text are used for text in the arrows. Unused text does not appear, but remains available if you switch layouts.

Repeating Bending Process

Use to show a progression or sequential steps in a task, process, or workflow. Maximizes both horizontal and vertical display space for shapes.

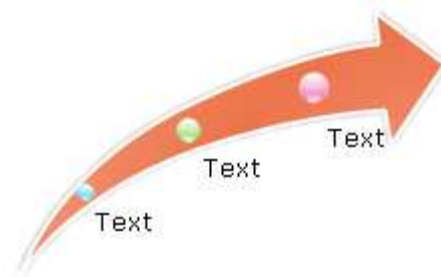
Segmented Process

Use to show a progression or sequential steps in a task, process, or workflow. Emphasizes Level 2 text, since each line appears in a separate shape.

Staggered Process

Use to show a downward progression through stages. Each of the first five lines of Level 1 text corresponds with a rectangle. Unused text does not appear, but remains available if you switch layouts.

Upward Arrow



Use to show a progression or steps that trend upward in a task, process, or workflow. Each of the first five lines of Level 1 text corresponds to a point on the arrow. Works best with minimal text. Unused text does not appear, but remains available if you switch layouts.

Vertical Bending Process

Use to show a progression or sequential steps in a task, process, or workflow. Maximizes both horizontal and vertical display space for shapes. Places more emphasis on the interrelationships among the shapes than on direction or movement.

Cycle Diagram

Edraw Max contains some symbols for designers to draw the cycle diagrams. Find the symbols in the [List](#), [Process](#), [Charts](#) and [Graphics](#) library.

Basic Cycle Diagram

Use to represent a continuing sequence of stages, tasks, or events in a circular flow. Emphasizes the stages or steps rather than the connecting arrows or flow. Works best with Level 1 text only.

Basic Pie Diagram



Use to show how individual parts form a whole. The first seven lines of Level 1 text correspond to the evenly distributed wedge or pie shapes. The top Level 1 text shape appears outside of the rest of the pie for emphasis. Unused text does not appear, but remains available if you switch layouts.

Basic Radial Diagram

Use to show the relationship to a central idea in a cycle. The first line of Level 1 text corresponds to the central shape, and its Level 2 text corresponds to the surrounding circular shapes. Unused text does not appear, but remains available if you switch layouts.

Block Cycle Diagram



Use to represent a continuing sequence of stages, tasks, or events in a circular flow. Emphasizes the stages or steps rather than the connecting arrows or flow.

Continuous Cycle

Use to represent a continuing sequence of stages, tasks, or events in a circular flow. Emphasizes the connection between all components. Works best with Level 1 text only.

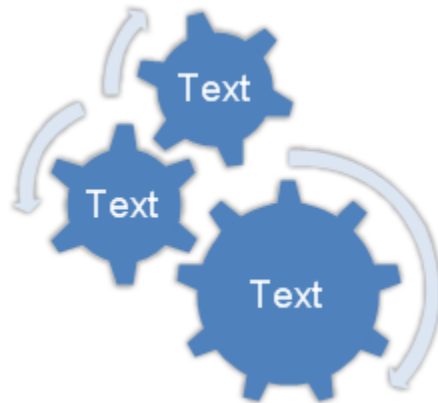
Cycle Matrix

Use to show the relationship to a central idea in a cyclical progression. Each of the first four lines of Level 1 text corresponds to a wedge or pie shape, and Level 2 text appears in a rectangular shape to the side of the wedge or pie shape. Unused text does not appear, but remains available if you switch layouts.

Diverging Radial Diagram

Use to show relationships to a central idea in a cycle. The first Level 1 line of text corresponds to the central circular shape. Emphasizes the surrounding circles rather than the central idea. Unused text does not appear, but remains available if you switch layouts.

Gear Diagram



Use to show interlocking ideas. Each of the first three lines of Level 1 text corresponds to a gear shape, and their corresponding Level 2 text appears in rectangles next to the gear shape. Unused text does not appear, but remains available if you switch layouts.

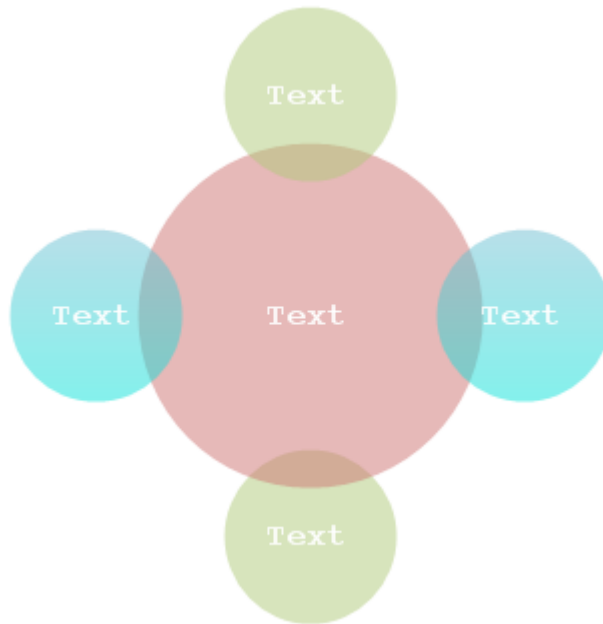
Multidirectional Cycle Diagram

Use to represent a continuing sequence of stages, tasks, or events that can occur in any direction.

Radial Cycle Diagram

Use to show the relationship to a central idea. Emphasizes both information in the center circle and how information in the outer ring of circles contributes to the central idea. The first Level 1 line of text corresponds to the central circle, and its Level 2 text corresponds to the outer ring of circles. Unused text does not appear, but remains available if you switch layouts.

Radial Venn

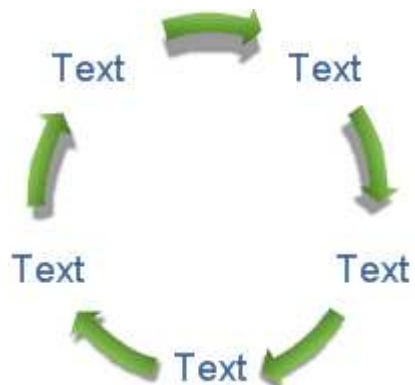


Use to show both overlapping relationships and the relationship to a central idea in a cycle. The first line of Level 1 text corresponds to the central shape and the lines of Level 2 text correspond to the surrounding circular shapes. Unused text does not appear, but remains available if you switch layouts.

Segmented Cycle Diagram

Use to show a progression or a sequence of stages, tasks, or events in a circular flow. Emphasizes the interconnected pieces. Each of the first seven lines of Level 1 text corresponds to a wedge or pie shape. Unused text does not appear, but remains available if you switch layouts.

Text Cycle Diagram



Use to represent a continuing sequence of stages, tasks, or events in a circular flow. Emphasizes the arrows or flow rather than the stages or steps. Works best with Level 1 text only.

WEEK 15 Practicals

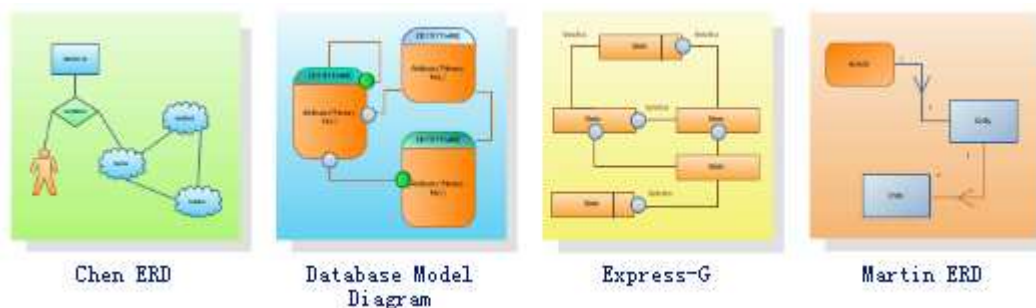
The student is expected here to familiarize himself with designing and drawing diagrams of Database models, Marketing models,

Database Model Diagrams

Draw database model diagrams

You can easily use an intuitive database design tool and database model Diagram tool which can save you hundreds hours of work.

This tool will allow you to reverse engineer already existing database structures, create detailed HTML or PDF reports.



The Entity-Relationship Model

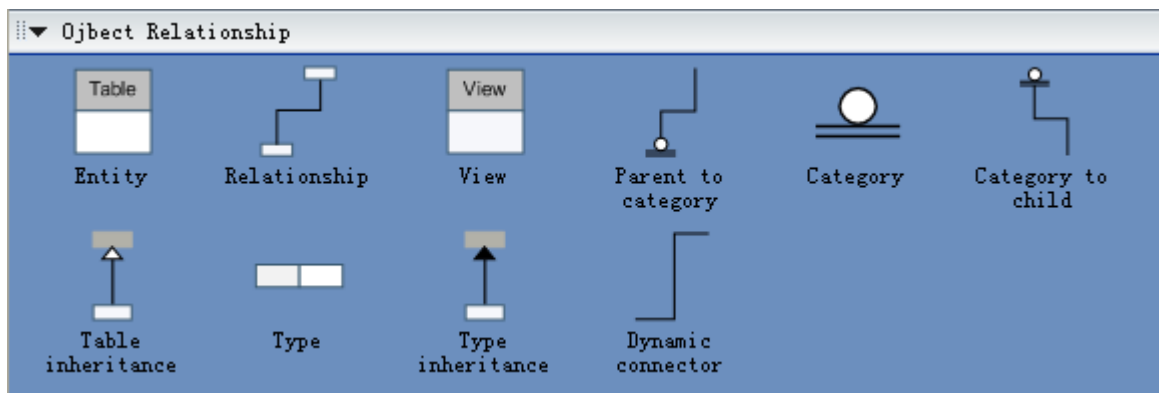
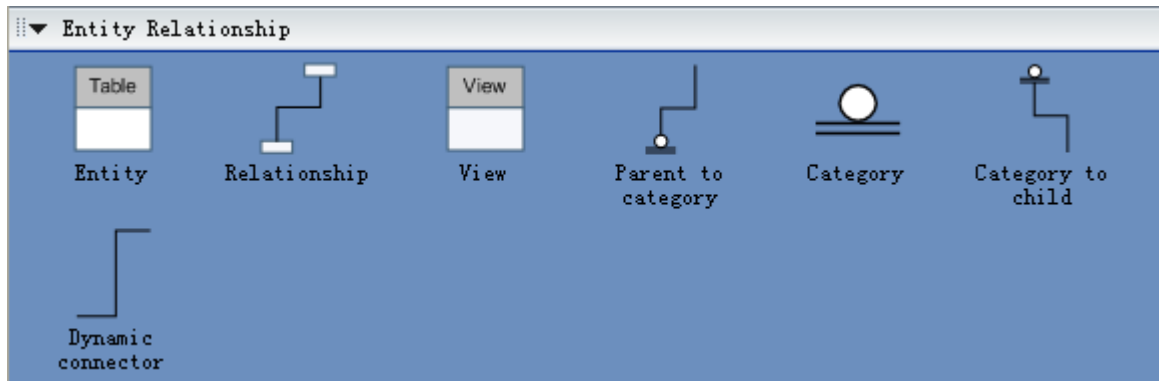
The Entity-Relationship (ER) model was originally proposed by Peter in 1976 [Chen76] as a way to unify the network and relational database views. Simply stated the ER model is a conceptual data model that views the real world as entities and relationships. A basic component of the model is the Entity-Relationship diagram which is used to visually represents data objects. Since Chen wrote his paper the model has been extended and today it is commonly used for database design For the database designer, the utility of the ER model is:

- it maps well to the relational model. The constructs used in the ER model can easily be transformed into relational tables.
- it is simple and easy to understand with a minimum of training. Therefore, the model can be used by the database designer to communicate the design to the end user.
- In addition, the model can be used as a design plan by the database developer to implement a data model in a specific database management software.

Symbols for Database Model Diagrams

Thanks to an extensive set of library objects such as entities, links, items, attributes, users, types, captions, inheritance, references, boundaries, events, clouds etc Edraw is a perfect tool for database model design and ER diagramming.

You can draw Chen ERD, Database model diagram, Express-G, Martin ERD, ORM Diagram and a lot more.



Basic Constructs of E-R Modeling

The ER model views the real world as a construct of entities and association between entities.

Entities

Entities are the principal data object about which information is to be collected. Entities are usually recognizable concepts, either concrete or abstract, such as person, places, things, or events which have relevance to the database. Some specific examples of entities are EMPLOYEES, PROJECTS, INVOICES. An entity is analogous to a table in the relational model.

Entities are classified as independent or dependent (in some methodologies, the terms used are strong and weak, respectively). An independent entity is one that does not rely on another for identification. A dependent entity is one that relies on another for identification.

An entity occurrence (also called an instance) is an individual occurrence of an entity. An occurrence is analogous to a row in the relational table.

Special Entity Types

Associative entities (also known as intersection entities) are entities used to associate two or more entities in order to reconcile a many-to-many relationship.

Subtypes entities are used in generalization hierarchies to represent a subset of instances of their parent entity, called the supertype, but which have attributes or relationships that apply only to the subset.

Associative entities and generalization hierarchies are discussed in more detail below.

Relationships

A Relationship represents an association between two or more entities. An example of a relationship would be:

1. employees are assigned to projects
2. projects have subtasks
3. departments manage one or more projects

Relationships are classified in terms of degree, connectivity, cardinality, and existence. These concepts will be discussed below.

Attributes

Attributes describe the entity of which they are associated. A particular instance of an attribute is a value. For example, "Jane R. Hathaway" is one value of the attribute Name. The domain of an attribute is the collection of all possible values an attribute can have. The domain of Name is a character string.

Attributes can be classified as identifiers or descriptors. Identifiers, more commonly called keys, uniquely identify an instance of an entity. A descriptor describes a non-unique characteristic of an entity instance.

Classifying Relationships

Relationships are classified by their degree, connectivity, cardinality, direction, type, and existence. Not all modeling methodologies use all these classifications.

Degree of a Relationship

The degree of a relationship is the number of entities associated with the relationship. The n-ary relationship is the general form for degree n. Special cases are the binary, and ternary, where the degree is 2, and 3, respectively.

Binary relationships, the association between two entities is the most common type in the real world. A recursive binary relationship occurs when an entity is related to itself. An example might be "some employees are married to other employees".

A ternary relationship involves three entities and is used when a binary relationship is inadequate. Many modeling approaches recognize only binary relationships. Ternary or n-ary relationships are decomposed into two or more binary relationships.

Direction

The direction of a relationship indicates the originating entity of a binary relationship. The entity from which a relationship originates is the parent entity; the entity where the relationship terminates is the child entity.

The direction of a relationship is determined by its connectivity. In a one-to-one relationship the direction is from the independent entity to a dependent entity. If both entities are independent, the direction is arbitrary. With one-to-many relationships, the entity occurring once is the parent. The direction of many-to-many relationships is arbitrary.

Type

An identifying relationship is one in which one of the child entities is also a dependent entity. A non-identifying relationship is one in which both entities are independent.

Existence

Existence denotes whether the existence of an entity instance is dependent upon the existence of another, related, entity instance. The existence of an entity in a relationship is defined as either mandatory or optional. If an instance of an entity must always occur for an entity to be included in a relationship, then it is mandatory. An example of mandatory existence is the statement "every project must be managed by a single department". If the instance of the entity is not required, it is optional. An example of optional existence is the statement, "employees may be assigned to work on projects".

Generalization Hierarchies

A generalization hierarchy is a form of abstraction that specifies that two or more entities that share common attributes can be generalized into a higher level entity type called a supertype or generic entity. The lower-level of entities become the subtype, or categories, to the super type. Subtypes are dependent entities.

ER Notation

There is no standard for representing data objects in ER diagrams. Each modeling methodology uses its own notation. The original notation used by Chen is widely used in academics texts and journals but rarely seen in either CASE tools or publications by non-academics. Today, there are a number of notations used, among the more common are Bachman, crow's foot, and IDEFIX.

All notational styles represent entities as rectangular boxes and relationships as lines connecting boxes. Each style uses a special set of symbols to represent the cardinality of a connection. The notation used in this document is from Martin. The symbols used for the basic ER constructs are:

- entities are represented by labeled rectangles. The label is the name of the entity. Entity names should be singular nouns.
- relationships are represented by a solid line connecting two entities. The name of the relationship is written above the line. Relationship names should be verbs.
- attributes, when included, are listed inside the entity rectangle. Attributes which are identifiers are underlined. Attribute names should be singular nouns.
- cardinality of many is represented by a line ending in a crow's foot. If the crow's foot is omitted, the cardinality is one.
- existence is represented by placing a circle or a perpendicular bar on the line. Mandatory existence is shown by the bar (looks like a 1) next to the entity for an instance is required. Optional existence is shown by placing a circle next to the entity that is optional.

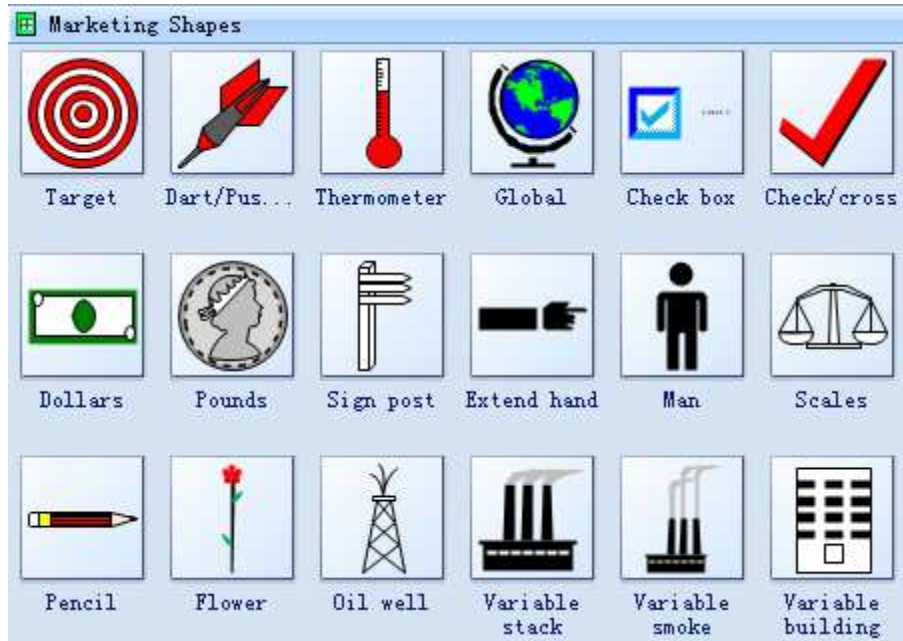
Draw Marketing Charts and Diagrams



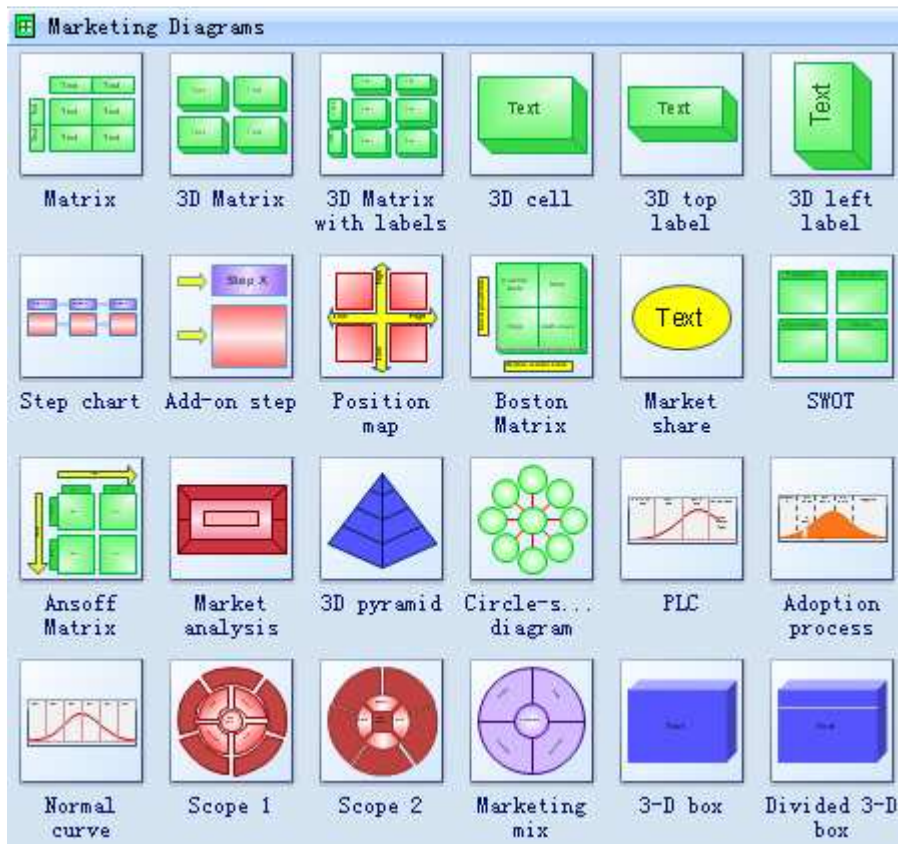
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Symbols for Marketing Charts and Diagrams

Marketing Shapes



Marketing Diagrams



Some symbols has the control points and you can move them to change the shape's appearance.

