1. Comparison of Various Process (Software Development Life Cycle) Models:

Waterfall vs. Incremental vs. Spiral vs. RAD Model

Properties of Model	Water-Fall Model	Incremental Model	Spiral Model	Rad Model
Planning in early stage	Yes	Yes	Yes	No
Returning to an earlier phase	No	Yes	Yes	Yes
Handle Large-Project	Not Appropriate	Not Appropriate	Appropriate	Not Appropriate
Detailed Documentation	Necessary	Yes but not much	Yes	Limited
Cost	Low	Low	Expensive	Low
Requirement Specifications	Beginning	Beginning	Beginning	Time boxed release
Flexibility to change	Difficult	Easy	Easy	Easy
User Involvement	Only at beginning	Intermediate	High	Only at the beginning
Maintenance	Least	Promotes Maintainability	Typical	Easily Maintained
Duration	Long	Very long	Long	Short
Risk Involvement	High	Low	Medium to high risk	Low
Framework Type	Linear	Linear + Iterative	Linear + Iterative	Linear
Testing	After completion of coding phase	After every iteration	At the end of the engineering phase	After completion of coding
Overlapping Phases	No	Yes (As parallel development is there)	No	Yes
Maintenance	Least Maintainable	Maintainable	Yes	Easily Maintainable
Re-usability	Least possible	To some extent	To some extent	Yes
Time-Frame	Very Long	Long	Long	Short
Working software availability	At the end of the life-cycle	At the end of every iteration	At the end of every iteration	At the end of the life cycle
Objective	High Assurance	Rapid Development	High Assurance	Rapid development
Team size	Large Team	Not Large Team	Large Team	Small Team
Customer control over administrator	Very Low	Yes	Yes	Yes

- If you are just a starter of project management, you are suggested to use the **work breakdown structure** (WBS) diagram because it is able to manage your projects efficiently.

- This simply yet comprehensive guide will tell you the key concepts, benefits, usages, and evaluation steps of the work breakdown structure with easy-to-understand examples.

➔**What is Work Breakdown Structure (WBS)?**

- A Work Breakdown Structure generally breaks down the main project objective into smaller and manageable parts (work packages) for specific departments to produce their task with details including budget, required resources, and people who in charge of the task.

- Here **deliverable** means any verifiable and unique product or capacity to carry out a target service.

- A **work package** is a deliverable at the lowest level of a work breakdown structure that used by team members to complete a specific task.

- For instance, the task of roofing is one of the work packages for constructing an office building. You can also think a work breakdown structure as an outline of your project.

- Here is a work breakdown structure example that shows the task details of an integrated management information system:
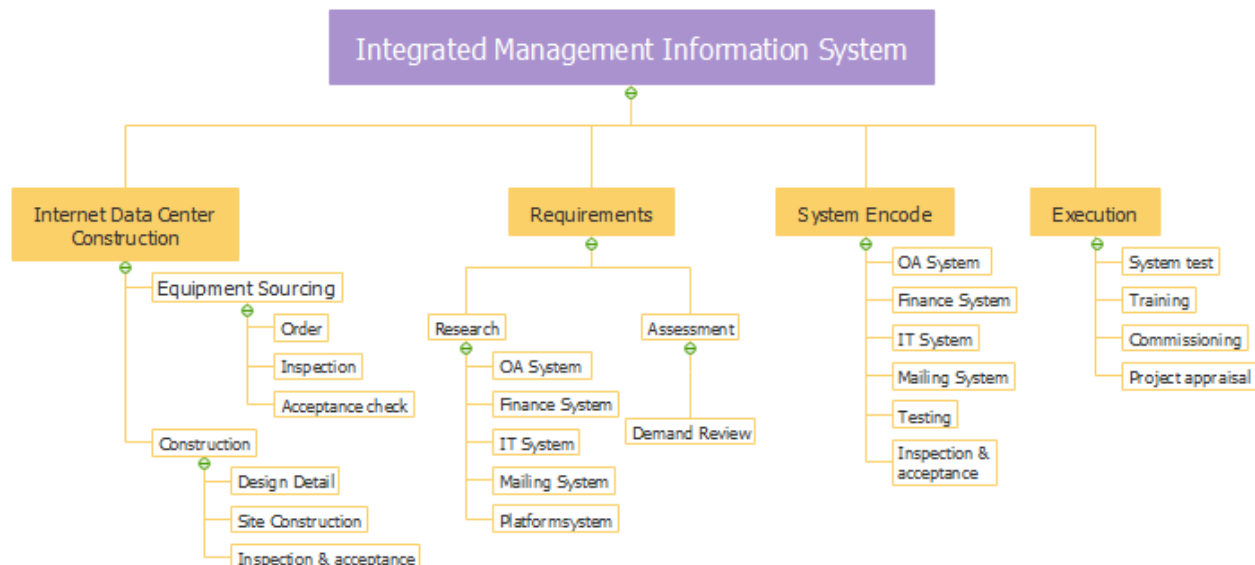
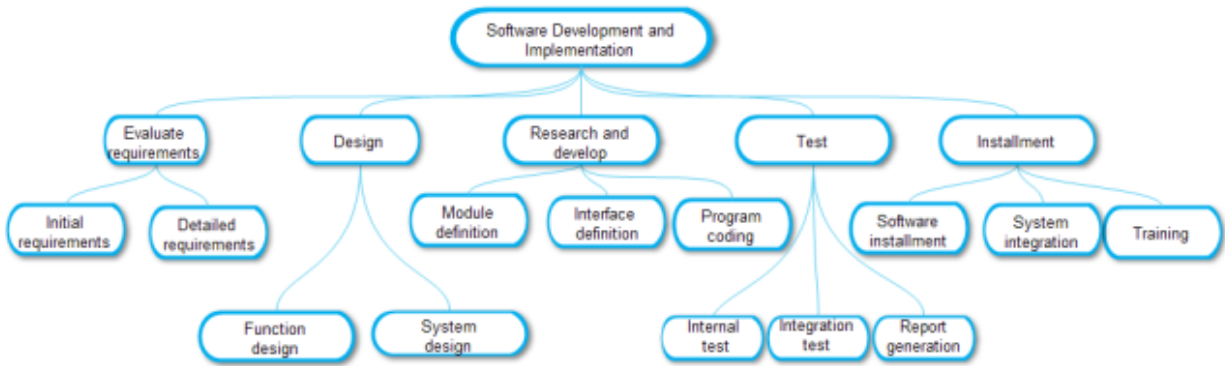**➔Why Use the Work Breakdown Structure?**

A well-crafted work breakdown structure can bring benefits not only to a specific project but also to your overall organization. More specific, using a work breakdown structure can help you:

- **Evaluate crucial details** of your project, such as project scope, project cost, potential risk and so on.
- **Check out your project based on a top-level view** so your team can easily decide a project timeline or schedule.
- **Facilitate team communication** to make sure that every team member and stakeholder is on the same page throughout the project lifecycle.
- **Easily track your tasks progress** , even for multi-projects at the same time. If your project is falling behind the original deadline, check out your work breakdown structure will help you easily spot the low-quality work package.
- **Quickly establish dependencies** of your project visually.
- **Efficiently assign tasks and resources** to your team members. In other words, the use of work breakdown structure would bring accountability to your team.

➔Who Uses Work Breakdown Structures?

The use of work breakdown structure can be applied in a wide range of areas including the following roles:

- **Commercial Project Team** members can be able to capture all the important pieces of their project in order to discuss with their vendors and governmental officers.
- **Construction Project Leaders** can use a work breakdown structure to track utility work and follow up environmental approvals.
- **Information Technology Engineers** can use a work breakdown structure as a roadmap for their program development, for example, software development, remote projects, database system development and more.
- **Event Planners** can use a work breakdown structure to display all the details of subtasks to move forward.

→**Work Breakdown Structure Formats**

- A work breakdown structure can be shown in a number of different formats including textual (a text outline with code numbers for each element), tabular tables with columns, graphical and **organizational charts** (tree structure).

- Among all of these types, the tree structure is the most common option which displays the hierarchy of work packages details with space for additional information.

- You should choose the correct format according to your project requirements.

→**Any Key Relationships between WBS and Typical Organizational Charts?**

You may have already noticed that the work breakdown structure is quite similar to a traditional organizational chart. The key differences and common points of these two types of structure can be concluded as the following:

- **Objective -** WBS usually focuses on deliverables or measurable milestones, whereas typical organizational charts generally focuses on employee titles and duties.

- **Structure -** The most common format of the work breakdown structure and traditional organizational charts are the hierarchical structure, which means each parent level has a number of child levels. However, in a matrix org chart or a flat org chart, links between staffs can be inter-crossed.

➔More Free Download Work Breakdown Structure Templates

Free download templates are available below to help your team to do a better work breakdown structure analysis.

WBS General Template
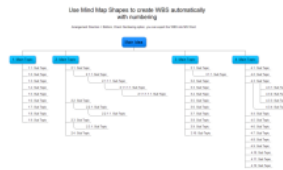
WBS Auto Industry Template

Work Breakdown Mind Map

➔How to Conduct a Work Breakdown Structure Analysis?

The overall drawing process is simple. You can use a pencil, or a diagram software to help you do so. Here we will discuss the most productive way.

- **Step 1: Team Communications**

  Gather your team members to find out the key aspects of your project from different points of views (project vision statement, project phases, project scope (any unexpected changes), stakeholders' needs, task list with deliverables etc.). For deciding deliverables and work packages, you should:
    - Define level one, level two and more for your projects.
    - Calculate the percentage of each team member's time for every stage of your project.
    - Assign each deliverable to an independent team.
    - Subdivide your project continuously until you think the components you defined are sufficient for your goal.

- **Step 2: Decide Your WBS Format**

  You can choose different WBS formats, such as the text-based hierarchical structure with numbers and decimal points. Alternatively, you can use a table-based, or organizational chart.

- **Step 3: Download the WBS Diagram Software and get started right away**

EdrawMax

All-in-One Diagram Software

Create more than 280 types of diagrams effortlessly
Start diagramming with various templates and symbols easily

- **Superior file compatibility:** Import and export drawings to various file formats, such as Visio
- **Cross-platform supported** (Windows, Mac, Linux, Web)

Start Edraw Max and go to **"Available Templates" - "Project Management" - "Work Breakdown Structure (WBS)"** , double-click to open a new drawing page. Alternatively, you can select one of the preset templates for your work.
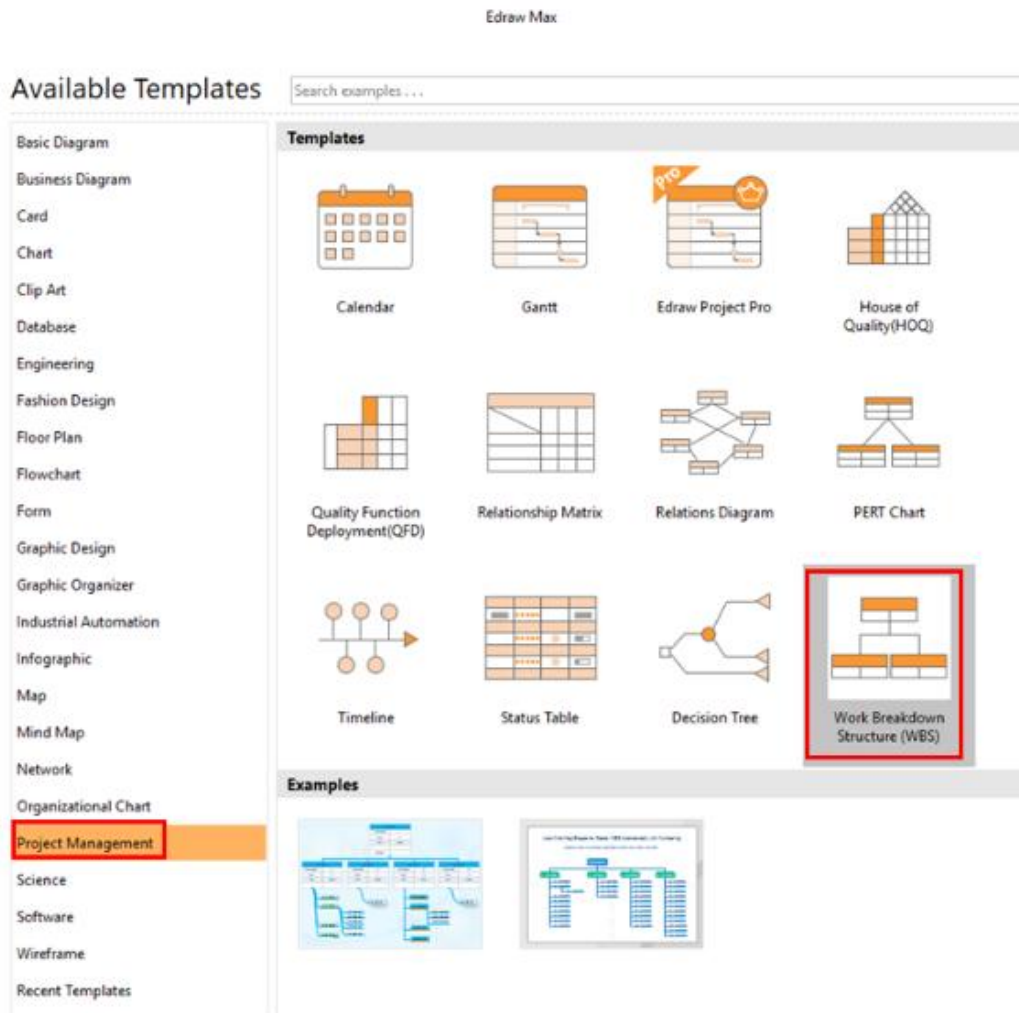
- **Step 4: Structure Your Diagram with Task Details**

  Drag and drop one type of the preset " **Task Card** " options from the left-hand library to the right-hand canvas and fill in your task details. Then use the **connectors** to connect them in a logical way.
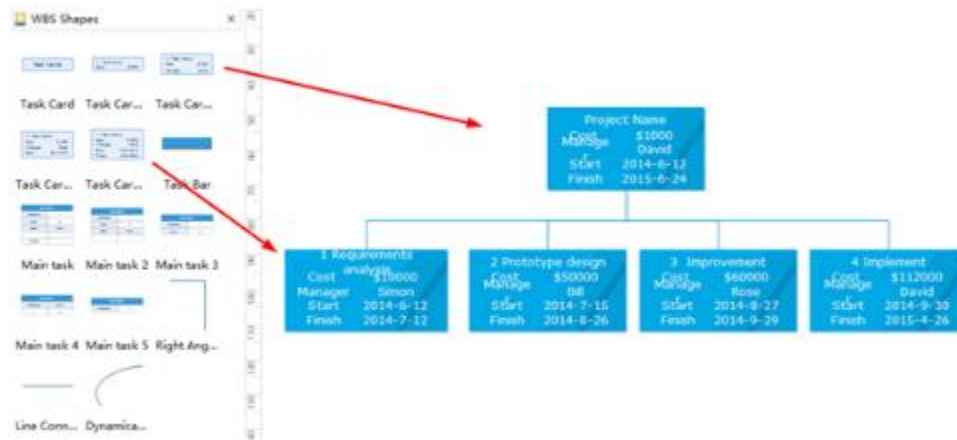
- **Step: 5 Break down Your Structure**

  Continuously breaking down your structure into more reasonable and measurable work packages depend on the type, size and complexity of your project.
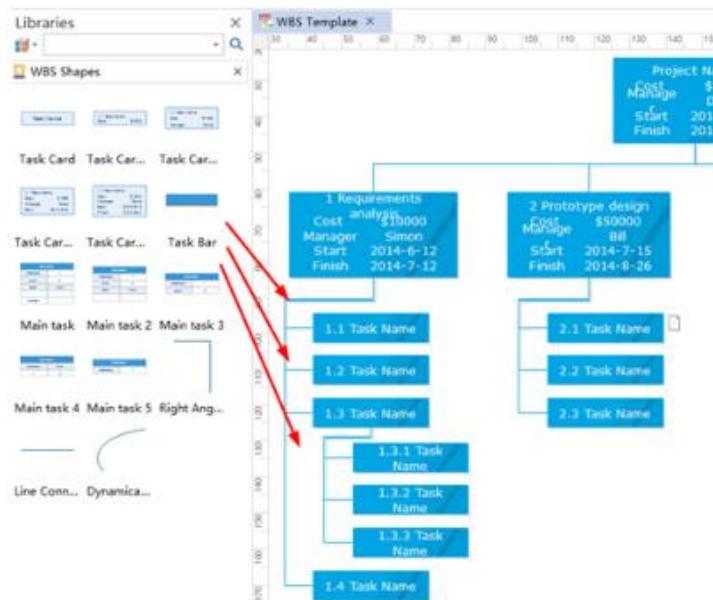
- **Final Step 6: Re-check Your Work**

  The final step is to ensure that all details are correctly applied to each work packages. You can also change the default theme of your work breakdown structure for a better visual presentation.

3. Gant Chart:

Part 1: What is Gantt Chart?

Gantt charts are a visual method of organising tasks over a period of time. The list of tasks are placed on the vertical axis, while the time is listed on the horizontal axis. Tasks are represented by bars on the axis; the longer the bar, the more time the task will take. Gantt charts will include information such as the start and end date of a project, the persons responsible for the task, and whether there is any overlap between tasks.

Gantt charts are extremely useful for planning projects ahead of time. They allow team members to see which tasks are the most time-consuming, and which ones should be prioritised. It also encourages greater teamwork and communication amongst team members in achieving the project.

Part 2: What to Consider when making a Gantt Chart?

This section will tell you what things are necessary to remember while making a Gantt chart because in working on a project, it's all about planning and good planning always leads to good platforms. It's important to consider all the things that are listed down below.

- The first thing you have to see is the primary tasks of your project that give more than fifty percent in the project. Know every bit of them and mark them.
- Know the time required to complete those vital tasks, decide the time after consulting the whole team.
- Set all the milestones.
- Know each and every person, their roles, and responsibility related to the project.
- Consider all the barriers that would stand in the way of completing the project.

Part 3: How to Create a Gantt Chart?

Before you start to make a Gantt chart, you can see this theoretical process and get everything needed in a Gantt chart.

- **Know the project:** It is essential before making a Gantt chart to know the project thoroughly. The first thing is to divide the whole project into sub-basic tasks, and then the whole team has to sit and study each task in the project carefully. Every bit of the task, the probable time it would consume, the resources required, etc.

  Just go through each step of the task. Because this is what complete planning is all about. After this process, you have to see how the tasks relate, the relationship between them, how they communicate, etc. According to this, you will decide the sequence of the tasks.

- **Decide the Time duration:** Now, when you have done all the division and studying process, it's time to set the time on which these tasks have to be completed. The exact time before this, the

probable time was set. For this purpose, it is vital to involve the whole team, take their feedback, and know their abilities. Decide the time the resource requires to complete a particular task.

- **Everyone should know everything:** It is important to consider the whole team while planning the project. Each and every person in the project should know what things are required to complete a project.

  They should know everything about the project. The person with whom they would communicate should know the milestones, the resources, and the tools used to complete a specific task. Everything in the project planning should be transparent to the whole team working on it.

- **Mapping all the things to the Gantt Chart:** After you have gathered all the tasks and the resources on a platform, now is the time to map all the stuff on the Gantt Chart. The chart should be made with all the considerations you have made.

  List down all the tasks on the first column, then there would be resources in the next column, and then you will set the bars in front of every or a group of tasks that will depict how much work has been done.

  Also, map the decided time duration above the chart plus set the milestones with the bars. Use computer software that will make your Gantt chart look complete and perfect.

How to Create a Gantt Chart Effortlessly?

Step 1: Start EdrawMax or visit EdrawMax Online directly.
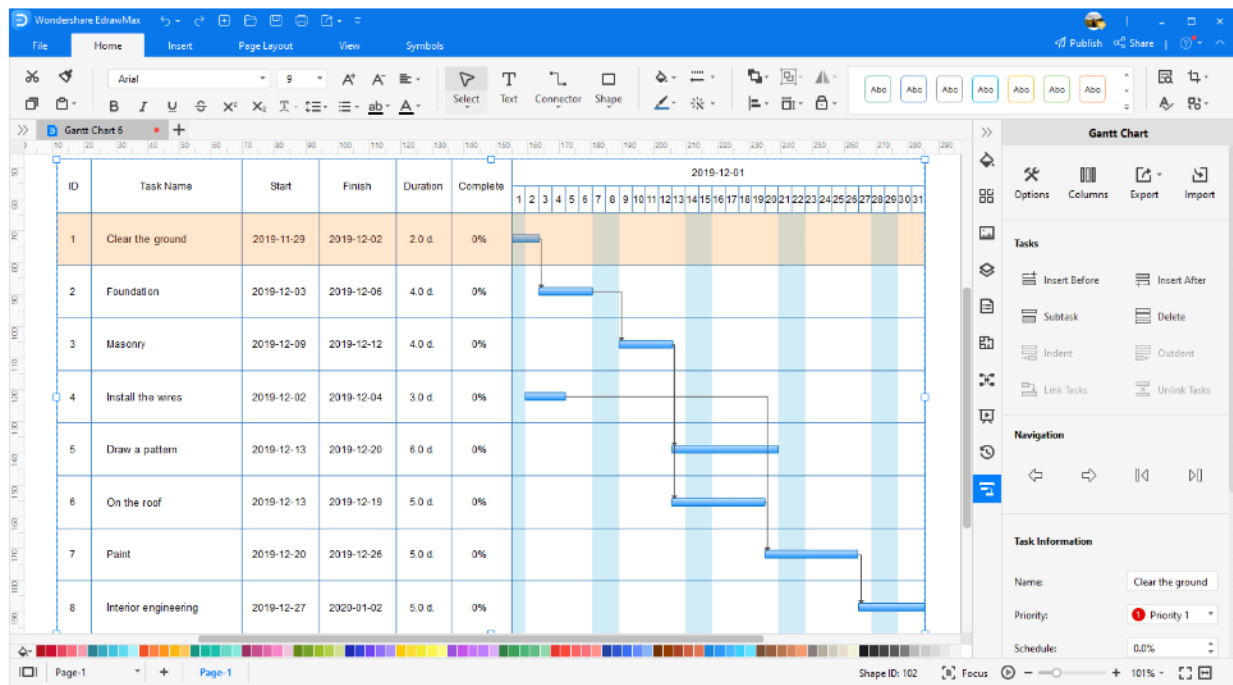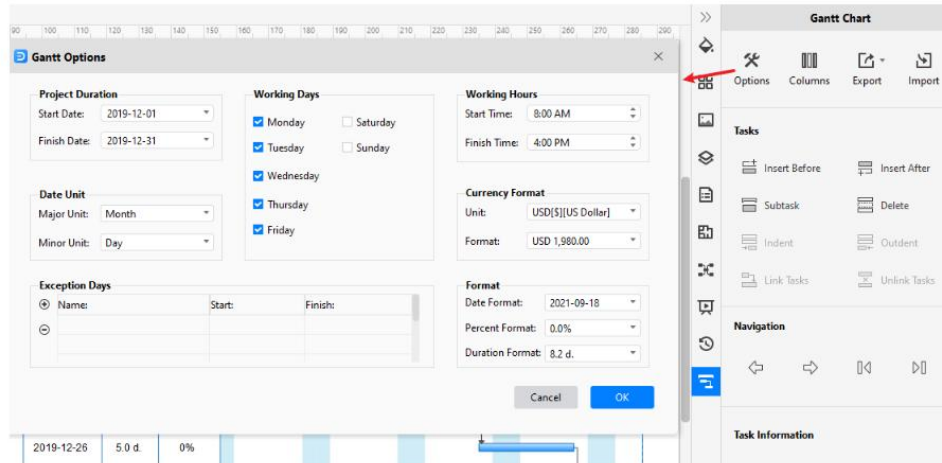
**Step 2:** Navigate to [Project Management]>[Gantt Charts]

**Step 3:** Select one gantt chart template to edit on it or click the [+] sign to start from scratch.

Step 3.1: Select the Gantt chart on the canvas, and the **Gantt Options** dialogue will pop up automatically. You can set the date unit, date format, start and finish date in the dialogue.

Step 3.2: Right-click on selected task and add a new task or a sub task. You can also use the quick buttons on the **Gantt Chart** pane to add a task, add a sub task, or delete a task.
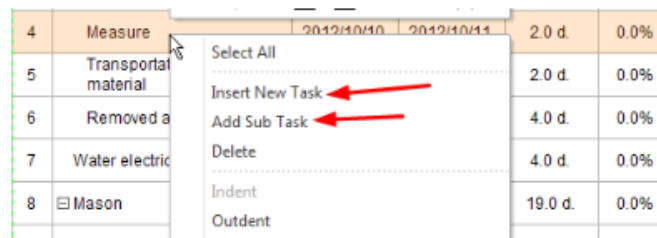

Step 3.3: Right-click on selected task and insert a new column after the selected column. Choose the title of column from the pop-up dialogue box. For example, we can add a priority column.
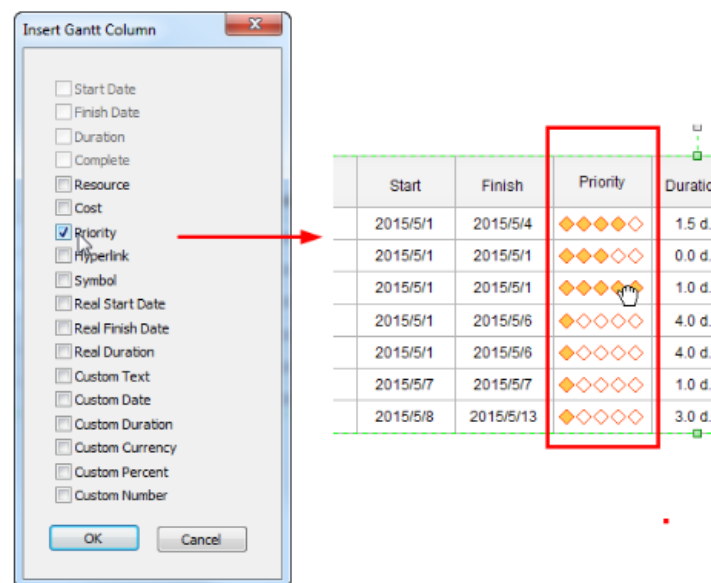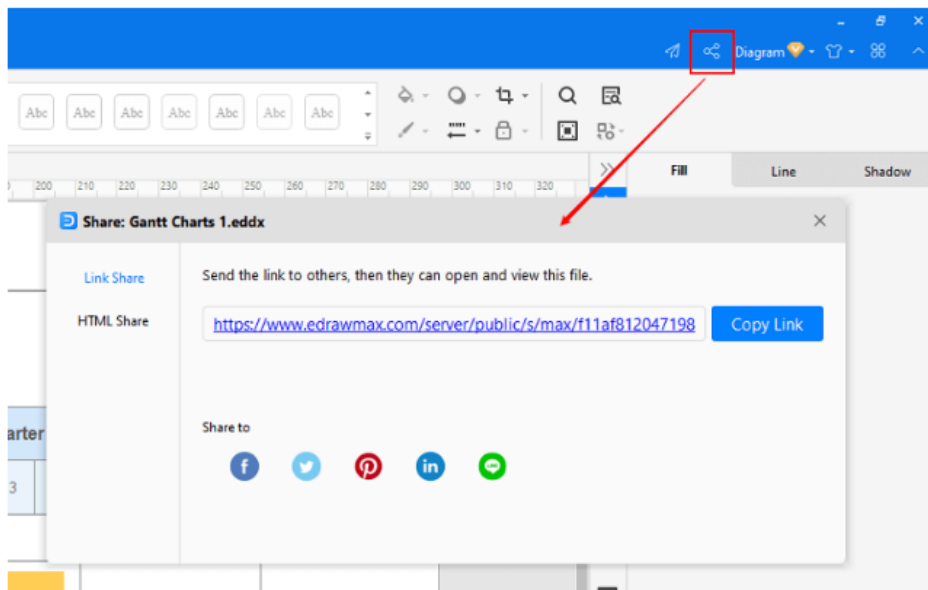
Note:

☐ You can change the priority by clicking on the symbol.

☐ To hide a column, right click on a column and choose **Hide Column**.

Step 4: You can export the file to Graphics, PDF, editable MS Office file, SVG and Visio vsdx file.
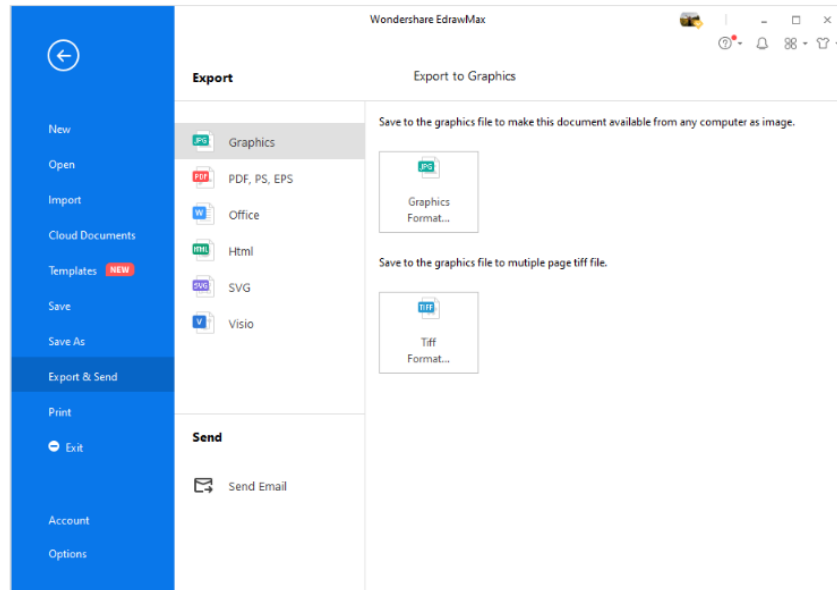
Step 5: And you can share your diagram with others via social media and online website page.

4.EdrawMax:

https://www.edrawsoft.com/guide/edrawmax/

https://www.edrawmax.com/guide/

https://www.edrawsoft.com/guide/edraw-max-user-manual-en.pdf

5.StarUML:

https://staruml.io/

https://docs.staruml.io/

https://readthedocs.org/projects/staruml/downloads/pdf/latest/