



**COMSATS University Islamabad,
Sahiwal, Pakistan**

**Project Proposal
(SCOPE DOCUMENT)
for**

**ProveItBlock - A Blockchain-Based System for
Detecting Fake Products**

Version 1.1

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Abstract / Short Summary

Fake products pose a serious threat to consumer safety and brand reputation. In response, we are proposing a blockchain-based system, **ProveItBlock**, that enables consumers to easily verify the authenticity of products they purchase. By using blockchain technology, **ProveItBlock** creates a secure, immutable record of product ownership and transaction history, which makes it difficult for a third-party person to create fake copies of the product.

Introduction

Fake products are a growing problem that affects both consumers and businesses around the world. Not only do fake products pose a serious safety risk to consumers, but they also damage the reputation of brands and have a negative impact on the economy. In response, we are proposing a blockchain-based system, ProveItBlock, that enables consumers to easily verify the authenticity of products they purchase.

ProveItBlock is a comprehensive solution to the problem of Fake products. It combines hardware and software components, including mobile devices, and blockchain nodes, to create a secure, immutable record of product ownership and transaction history. By leveraging the transparency and security of blockchain technology, ProveItBlock makes it difficult for a third-party person to create fake copies of the product.

The purpose of this project proposal document is to provide an overview of ProveItBlock and outline the steps needed to bring it to market. In the following sections, we will provide a detailed description of the system, including its key components, benefits, and potential use cases. We will also discuss the technical requirements, development timeline, and budget needed to build and launch ProveItBlock.

ProveItBlock is an innovative solution that has the potential to significantly reduce the prevalence of fake products, protect consumer safety, and enhance brand reputation. We believe that this project proposal document provides a compelling case for the development and launch of ProveItBlock, and we look forward to bringing this groundbreaking system to market.

Problem Statement

Fake products are a growing problem that affects consumers, businesses, and economies worldwide. According to the Global Brand Counterfeiting Report, the value of fake goods is expected to reach \$3 trillion by 2023, up from \$1.2 trillion in 2017. The

rapid increase of fake products poses a serious safety risk to consumers, as well as damaging the reputation of brands and impacting the economy. Traditional anti-fake product measures such as holograms, serial numbers, and packaging designs are easily replicated by scammers, making it difficult to distinguish fake products from genuine ones.

There is a clear need for a comprehensive solution that can effectively combat the problem of fake products. A system is required that can authenticate the ownership and transaction history of a product in a way that is secure, transparent, and tamper-proof. Such a system would enable consumers to easily verify the authenticity of a product they are considering purchasing and could help to reduce the prevalence of fake products in the marketplace.

Problem Solution for Proposed System

Our proposed solution is to use blockchain technology to create a secure and tamper-proof system for verifying product authenticity. By using blockchain, we can create an immutable ledger that stores information related to the product's manufacturing process, including the date of production, the manufacturer, and any other relevant information. This information can then be easily accessed by consumers and businesses to verify the authenticity of the product. Additionally, because the data stored on the blockchain is decentralized and secure, it is difficult for scammers to tamper with or replicate, and this makes it a reliable method of product authentication.

Related System Analysis/Literature Review

1. The first paper discusses various techniques for identifying counterfeit products, which is a critical issue given the enormous amount of online and black-market sales. The authors argue that designing appropriate technology is necessary to improve detection accuracy and address the challenges of counterfeit products.
2. The second paper proposes a brand protection and anti-counterfeiting solution for the wine industry based on smart tags and Cloud-enabled technologies. The idea behind smart tags is to use quick response codes and functional inks supported by the Cloud system and two-way communication between the winemaker and end-user. This solution could help to prevent wine fraud, which is a significant problem in the industry.
3. The third paper proposes a blockchain-based supply chain quality management framework that provides a theoretical basis for intelligent quality management of the supply chain based on blockchain technology. This framework could help to prevent counterfeiting and improve supply chain transparency by tracking products from the source to the end consumer.

Advantages/Benefits of Proposed System

Some advantages of using this blockchain-based system are the following:

1- Increased trust:

By providing a secure and tamper-proof method of verifying product authenticity, consumers and businesses can have increased trust in the products they purchase and sell. This can lead to increased customer loyalty and brand reputation.

2- Reduced financial losses:

Fake products can result in significant financial losses for businesses. By reducing the prevalence of fake products, the proposed system can help businesses save money and improve their bottom line.

3- Improved consumer safety:

In some cases, fake products can pose health and safety risks to consumers. By using blockchain technology to verify product authenticity, consumers can have more confidence that the products they purchase are safe, authentic, and of high quality.

4- Streamlined supply chain:

The proposed system can also help streamline the supply chain by providing a single source of truth for product information. This can help businesses reduce the risk of fraud and errors in the supply chain, resulting in more efficient and cost-effective operations.

5- Compliance with regulations:

Some industries may be subject to regulations related to product authenticity. By using a blockchain-based system, businesses can demonstrate compliance with these regulations and avoid potential fines or legal issues.

Scope

ProveItBlock will focus on detecting fake products. The system will use blockchain technology to create a secure and tamper-proof ledger that stores information related to the product's manufacturing process, including the date of production, the manufacturer, and any other relevant information. The system will have the following features:

- 1- Product authentication:** The system will provide a method for verifying the authenticity of a product by scanning a QR code or barcode on the product's packaging.

- 2- **Blockchain integration:** The system will be integrated with a blockchain platform, such as Ethereum or Hyperledger Fabric, to provide a secure and decentralized method of storing and accessing product information.
- 3- **User interface:** The system will have a user-friendly interface that allows both consumers and businesses to easily access and verify product information.
- 4- **Data collection:** The system will collect data related to product authenticity from various sources, such as manufacturers and distributors, and store it on the blockchain.
- 5- **Reporting and analytics:** The system will provide reporting and analytics capabilities that allow businesses to track product authenticity trends and identify potential issues in the supply chain.

The system will be scalable and adaptable to different industries or product categories and will be designed to meet the specific needs of businesses and consumers in each industry.

Modules

ProveItBlock will have the following Modules:

1- User authentication:

This module would allow users to create accounts and authenticate themselves before accessing the system. This would help to ensure that only authorized users can access product information and verify product authenticity.

2- Product registration:

This module would allow manufacturers to register their products on the blockchain. This would involve providing information such as the product name, manufacturer, date of production, and other relevant information.

3- Data collection:

This module would collect data related to product authenticity from various sources, such as manufacturers, distributors, and retailers. This data would be stored on the blockchain, providing a secure and tamper-proof record of the product's manufacturing process.

4- Product authentication:

This module would provide a method for users to verify the authenticity of a product by scanning a QR code or barcode on the product's packaging. The system would then retrieve the product information from the blockchain and compare it to the information provided by the manufacturer.

5- Blockchain integration:

This module would provide the necessary interfaces and protocols to integrate the system with a blockchain platform, such as Ethereum or Hyperledger Fabric. This module would ensure that the data stored on the blockchain is secure and tamper-proof and that the system can access and retrieve data from the blockchain as needed.

6- Administration and management:

This module would provide the necessary tools and interfaces for system administrators to manage users, products, and data within the system. This module would also include features such as backup and recovery, system monitoring, and user permissions management.

System Limitations/Constraints

ProveItBlock has some limitations/constraints and some of them are the following:

1- Limited adoption:

The use of blockchain technology for product authentication is still relatively new, and many businesses may be hesitant to adopt it. This could limit the reach and effectiveness of the system.

2- Integration challenges:

Integrating the system with existing supply chain management systems could be challenging, and may require significant time and resources to implement.

3- Barcode/QR code accuracy:

The accuracy of barcode and QR code scanning technologies could impact the effectiveness of the system. Scanning errors could result in false positives or false negatives, which could undermine the credibility of the system.

4- Cost:

Implementing a blockchain-based system for product authentication could be costly, particularly for small businesses. The cost of developing, implementing, and maintaining the system could be a barrier to adoption.

5- Regulatory constraints:

Some industries may be subject to regulations related to product authentication, which could impact the design and implementation of the system. Compliance with these regulations could also add to the cost and complexity of the system.

6- Limited scope:

The system may be limited in scope to a specific industry or product category, which could limit its usefulness for businesses operating in other industries.

7- Security risks:

While blockchain technology provides a secure and tamper-proof method of storing and accessing data, it is not immune to security risks. Hackers could potentially breach the system, resulting in the compromise of product information or other sensitive data.

Software Process Methodology (Under Process)

The agile methodology is a software development approach that emphasizes flexibility and adaptability. It focuses on iterative and incremental development, with continuous

collaboration between the development team and the stakeholders. The methodology is particularly well-suited for projects that require frequent changes and updates, such as the development of fake product detection software.

Tools and Technologies

Tools And Technologies	Tools	Version	Rationale
	Visual Studio Code	2023	IDE
	Firebase	2023	DBMS
	MetaMask	10.26.2	Crypto wallet
	Solc	0.8.19	Solidity compiler
	Remix	v1.14.3	IDE
	Ganache	7.7.7	Ethereum blockchain
	Figma	2023	UI/UX
	MS Word	2023	Documentation
	MS Power Point	2023	Presentation
	Adobe Photoshop	2023	Mockups Creation
	Technology	Version	Rationale
HTML	HTML5		Markup Language
CSS	W3. CSS 4.15		Style Language
JavaScript	ECMAScript 2022		Programming Language
React JS	18.2.0		Web Framework
Tailwind CSS	v2.0		CSS Framework
Solidity	v0.8.0		Programming Language

	Ethereum	2.0	Blockchain Network
	Truffle	5.8.1	Blockchain framework

Project Stakeholders and Roles

Write down the project stakeholders and their roles.

Table 3 Project Stakeholders for Proposed Project

Project Sponsor	COMSATS University, Islamabad Sahiwal Campus
Stakeholder	<p>Mention your stake holders with their roles and responsibilities. Default option will be:</p> <ul style="list-style-type: none"> • Ali Haider • Ahmad Raza • Junead Younas • Project Supervisor Name: Mr. Ali Usman • Final Year Project Committee: Evaluation of project

Team Members Individual Tasks/Work Division

Table 4 Team Member Work Division for Proposed Project

Student Name	Student Registration Number	Responsibility/ Modules
Ali Haider	FA20-BSE-009	Manage UI/UX Design
Ahmad Raza	FA20-BSE-041	Front End Developer
Junead Younas	FA20-BSE-047	Working on Blockchain Technology .

Data Gathering Approach

We gather Data from different brands that they want to use our software or The stakeholder provide information about data.

Concepts

Some of the most relevant concepts are:

Decentralization: Blockchain technology is decentralized, which means that there is no central authority controlling the network. This makes it difficult for attackers to manipulate or tamper with data in the blockchain.

Immutable and tamper-evident ledger: The blockchain ledger is immutable and tamper-evident, meaning that once data is added to the blockchain, it cannot be modified or deleted without leaving a trace.

Consensus Mechanism: Blockchain uses a consensus mechanism to validate transactions and prevent double-spending. This ensures that all nodes on the network have the same copy of the ledger, making it difficult for attackers to manipulate the data.

Smart Contracts: Smart contracts are self-executing contracts with the terms of the agreement between buyer and seller being directly written into lines of code. They can be used in the supply chain to track and verify the authenticity of products.

Conclusion

In conclusion, the final year project on fake product detection has been a success in achieving its objectives. The project aimed to design and implement a software solution that can accurately detect counterfeit products and improve the overall safety of consumers. The project utilized agile methodology, which allowed for iterative development and continuous improvement based on user feedback. The team successfully gathered data from various sources and used it to train the machine learning models. The blockchain technology was also used to ensure data security and prevent tampering.

The developed software solution has significant implications for the consumer goods industry. By improving the detection of counterfeit products, the software solution can help protect consumers from the harmful effects of counterfeit products such as health hazards, financial losses, and damage to the brand reputation of legitimate businesses.

References

[1] Si Chen, Rui Shi, Ren, Jiaqi Yan, Yani Shi, "A Blockchain-based Supply Chain Quality Management Framework", 14th, IEEE International Conference on e-Business Engineering, 2017.

[2] Blockchain Based Fake Product Identification in Supply Chain www.irjet.net: Ajay Funde, Pranjal Nahar, Ashwini Khilari.

[3] Fake News Detection In Social Media using Blockchain: - Shovon Paul, Jubair Joy, Shaila Sarkar.

1. The first paper, "A Blockchain-based Supply Chain Quality Management Framework" by Si Chen et al., proposes a blockchain-based framework for intelligent quality management of the supply chain. This framework uses blockchain technology to create a tamper-evident and immutable record of all transactions and events within the supply

chain. By leveraging the transparency and security of blockchain, this framework can ensure that all parties within the supply chain have access to accurate and up-to-date information, enabling them to detect and prevent fake products from entering the supply chain

2. The second paper, "Blockchain Based Fake Product Identification in Supply Chain" by Ajay Funde et al., presents a solution for identifying fake products in the supply chain using blockchain technology.
3. The third paper, "Fake News Detection In Social Media using Blockchain" by Shovon Paul et al., explores the potential of blockchain technology for detecting fake news in social media. The proposed solution uses blockchain to create a decentralized and transparent system for verifying the authenticity of news articles.



COMSATS University Islamabad, Lahore Campus

Software Project Management Lab Manual



Lab 1

Introduction: Introduction to Software Project Management and its Tools

Problem Statement: In this 1st lab we will learn different type of **software projects** and their **constraints**. What are different **tools** being used professionally for software project management. In the end we will **install** MS Project 2013.

Software Project Management

Software project management refers to the branch of project management dedicated to the **planning, scheduling, resource allocation, execution, tracking** and **delivery** of software projects.

Software Projects

- Mobile Patient Tracker App.
- Online Learning Management Systems / e-learning system.
- Fingerprint voting system.
- Home automation system.
- Game development for mobile users.
- Ecommerce store.



Project Constraints

Projects are executed in constraints. **PMBOK's 5th ed** recognizes many constraints:

- Scope: What is the project trying to accomplish?
- Time: How long should it take to complete?
- Cost: What should it cost?
- Quality: What are the quality specifications to be delivered?
- Resource: What man, material, equipment is required?
- Risk: What are the potential risks?

Project Management Tools

Tools	Features
Asana	Combines elements of project management, file storage, and collaboration and helps to manage projects across a team without email.
JIRA	It is a cross-platform issue and bug tracking software with advanced project management capabilities and features.
Trello	Is known for visualizing project tasks on a cardboard-like dashboard that's great for managing short and quick everyday assignments.
Zoho Projects	is one of the best-known tools for simple project management , that can help teams streamline their upcoming work and tasks.
MS Project	Helps to track the information about Project goals, cost, deadlines, and resources.

In this course we will work using MS Project. We might put light on other tools if we get time.



Lab Task:

Install MS Project 2013 into your laptops.

Link : <https://getintopc.com/softwares/development/microsoft-project-2013-free-download-6366710/>

Link to the video to follow the steps: <https://www.youtube.com/watch?v=02ncvGsp9yw>

Lab 2

Introduction: Getting Started with MS Project

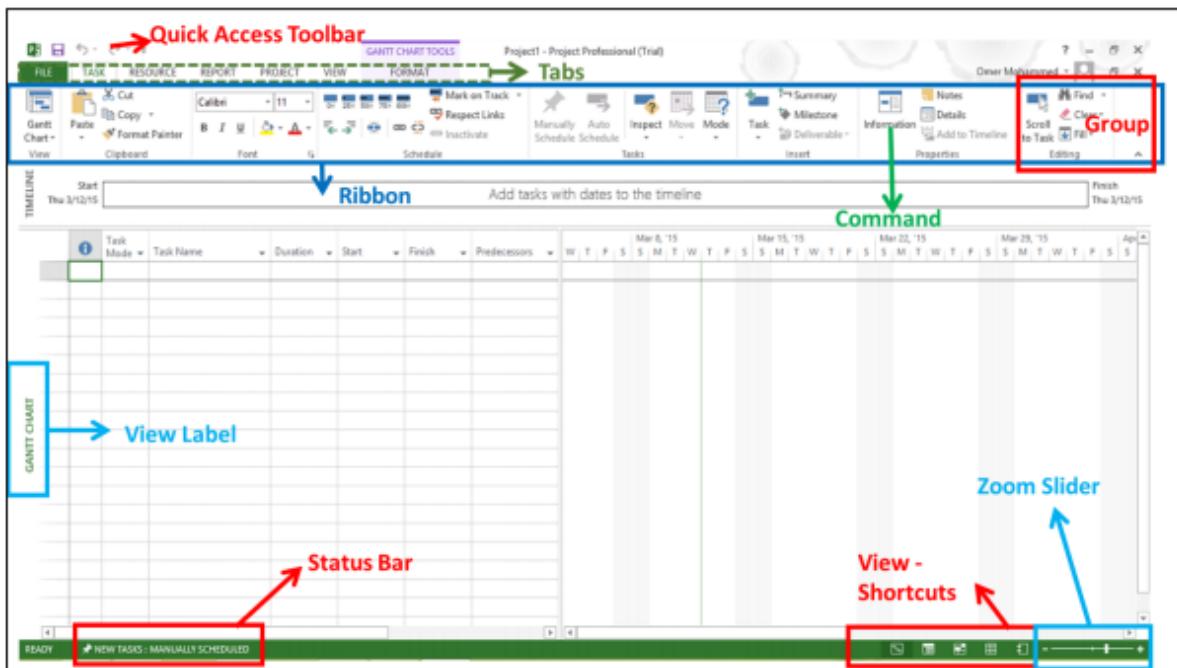
Problem statement:

- Learning how to get started with MS Project 2013
- Understanding User Interface of MS Project
- Learning and implementing different views in MS Project.

Windows 7 – Click on Start menu > All Programs > click Microsoft Office >and then click Project 2013.

Windows 8 – On the Start screen > tap or click Project 2013.

Windows 10 – Click on Start menu > All apps > Microsoft Office > Project 2013.



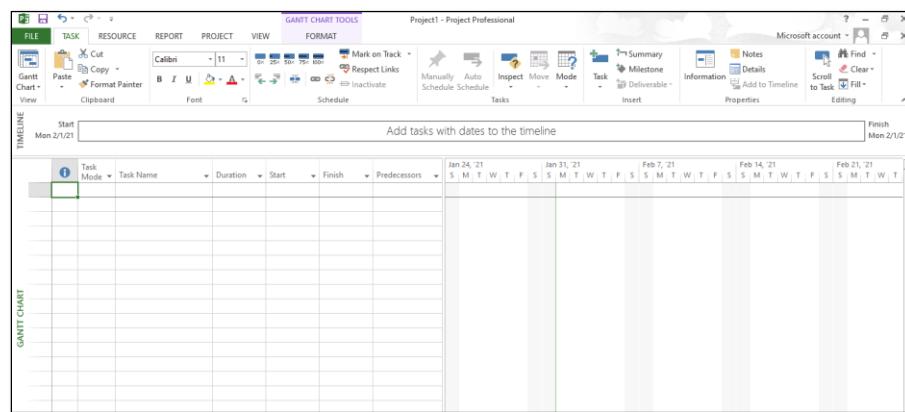
Major part of this interface are:

- **Quick Access Toolbar**: A customizable area where you can add the frequently used commands.
- **Tabs on the Ribbon, Groups**: With the release of Microsoft Office 2007 came the "Fluent User Interface" or "Fluent UI", which replaced menus and customizable toolbars with a single "Office menu", a miniature toolbar known as "quick-access toolbar" and what came to be known as the ribbon having multiple tabs, each holding a toolbar bearing buttons and occasionally other controls. Toolbar controls have heterogeneous sizes and are classified in visually distinguishable Groups. Groups are collections of related commands. Each tab is divided into multiple groups.
- **Commands**: The specific features you use to perform actions in Project. Each tab contains several commands. If you point at a command, you will see a description in a tooltip.
- **View Label**: This appears along the left edge of the active view. Active view is the one you can see in the main window at a given point in time. Project includes lots of views like Gantt Chart view, Network Diagram view, Task Usage view, etc. The View label just tells you about the view you are using currently. Project can display a single view or multiple views in separate panes.
- **View Shortcuts**: This lets you switch between frequently used views in Project.
- **Zoom Slider**: Simply zooms the active view in or out.
- **Status bar**: Displays details like the scheduling mode of new tasks (manual or automatic) and details of filter applied to the active view.

Learning About Different Views in MS Project

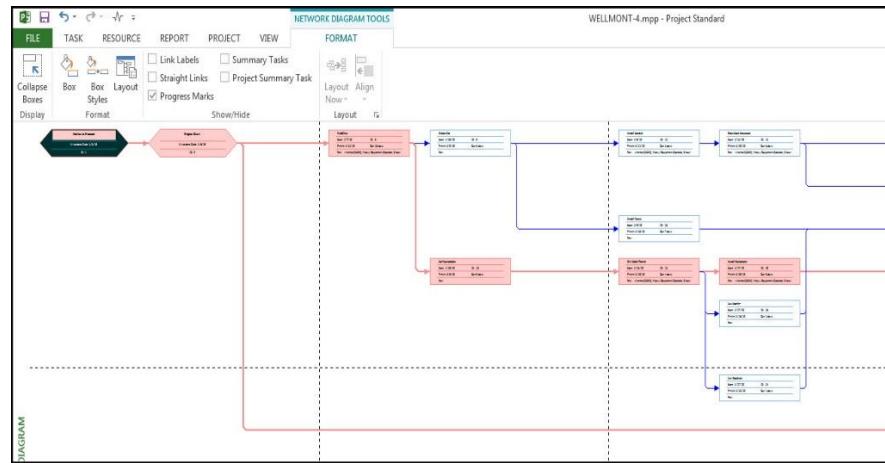
Project uses three types of views: task views, resource views, and assignment views. Let's explore them.

- **Gantt Chart View:** It is the default view of MS Project. It lists the tasks in your project, and illustrates their relationship to one another and the schedule using Gantt bars.

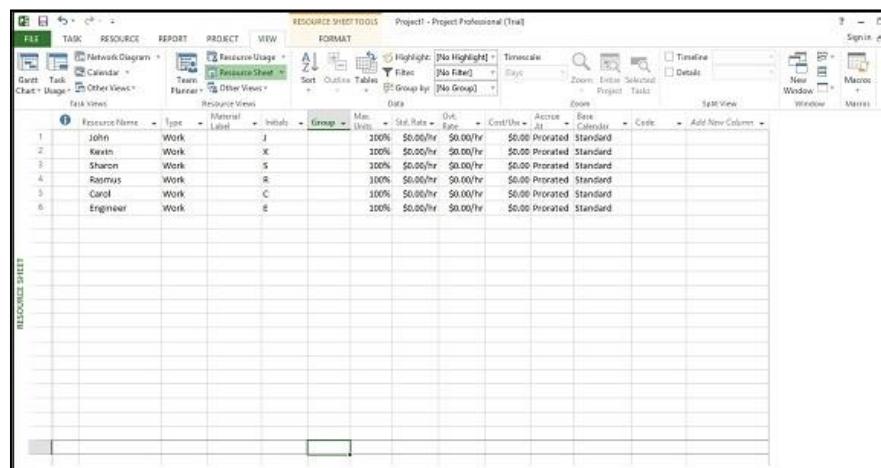


- **Network Diagram View:** A Network Diagram is a graphical way to view tasks, dependencies, and the critical path of your project.

The Network Diagram view was called the PERT Chart in earlier versions of Project. This view shows the dependencies between tasks in a graphical manner. Gantt chart is primarily meant to view the schedule time line, whereas Network diagram to view the all type of dependencies in the project.



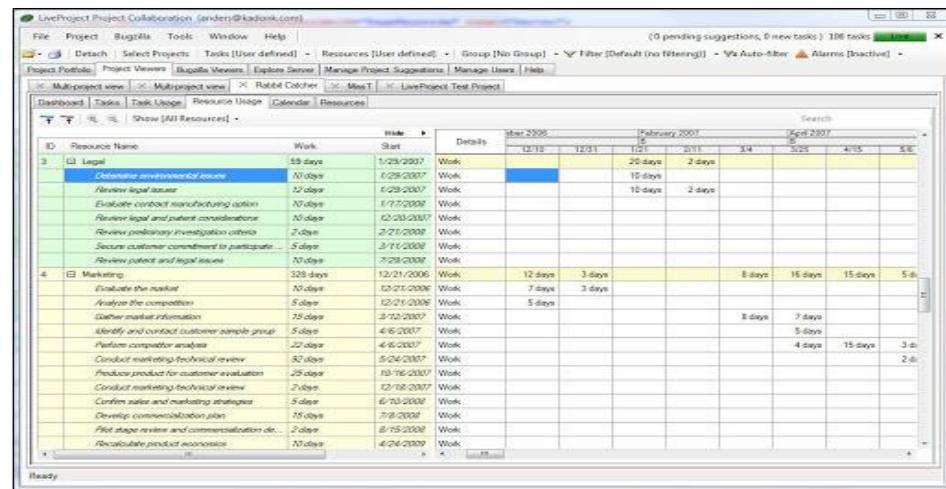
- **Resource Sheet View:** is a view within Project that allows the user to view, create, and edit resources and resource information.



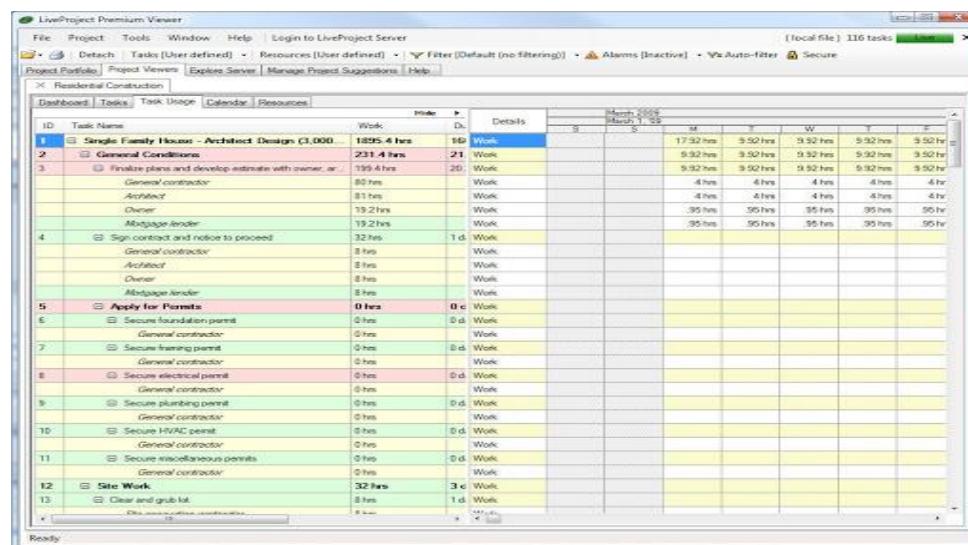
The screenshot shows a Microsoft Project Resource Sheet view. The table lists resources and the tasks they are assigned to. The columns include Resource Name, Type, Label, Group, and various work-related metrics like Man. Units, Start Date, End Date, Cost/Bu., Accrue At, and Basis.

	Resource Name	Type	Label	Group	Man. Units	Start Date	End Date	Cost/Bu.	Accrue At	Basis	Code	Add New Column
1	John	Work	J		100%	\$0.00/hr	\$0.00/Yr	\$0.00	Prioritized	Standard		
2	Karen	Work	K		100%	\$0.00/hr	\$0.00/Yr	\$0.00	Prioritized	Standard		
3	Sharon	Work	S		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prioritized	Standard		
4	Rasmus	Work	R		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prioritized	Standard		
5	Carol	Work	C		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prioritized	Standard		
6	Engineer	Work	E		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prioritized	Standard		

- **Resource usage view:** Resource Usage view is a functionality that lists for each resource the assigned tasks and the total amount of work that the resource is scheduled to perform on each task. Basically it groups the tasks against each resource.



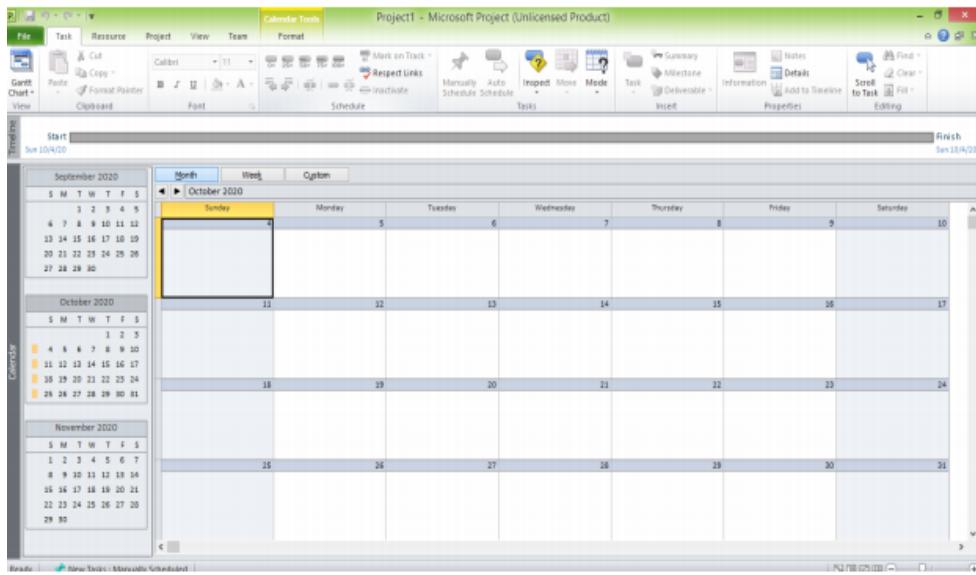
- **Task Usage View:** shows details about each task that which task is assigned to whom and working schedule of each resource.



- **Calendar view:** It assists you in showing which tasks are scheduled for which days in a calendar layout.



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Lab 3 & 4

Project Plan

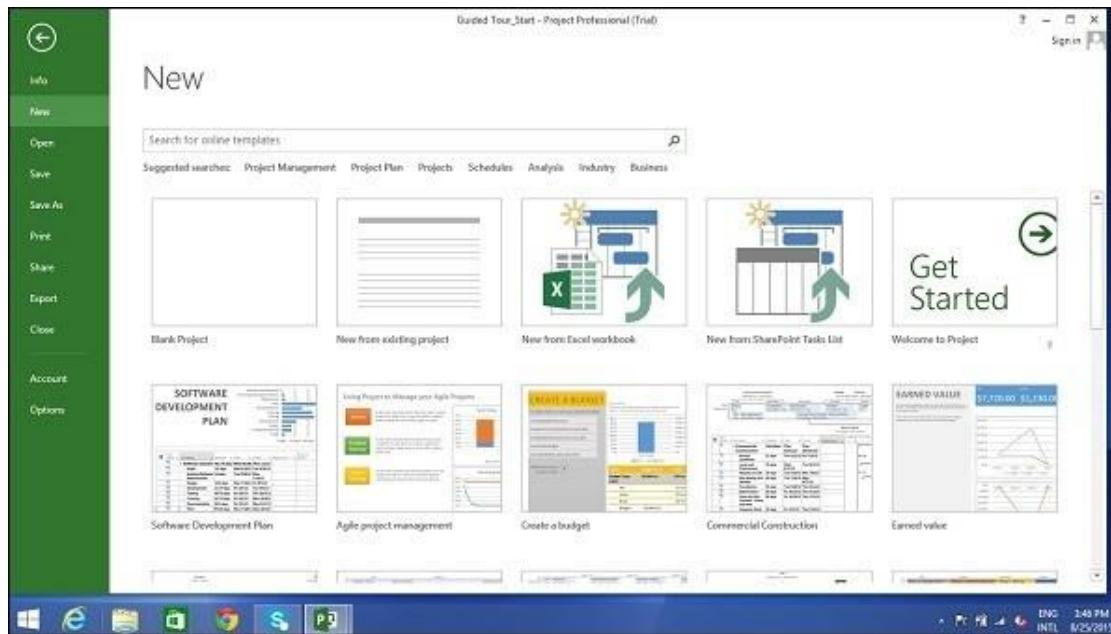
Introduction: Create A New Project Plan

Problem Statement:

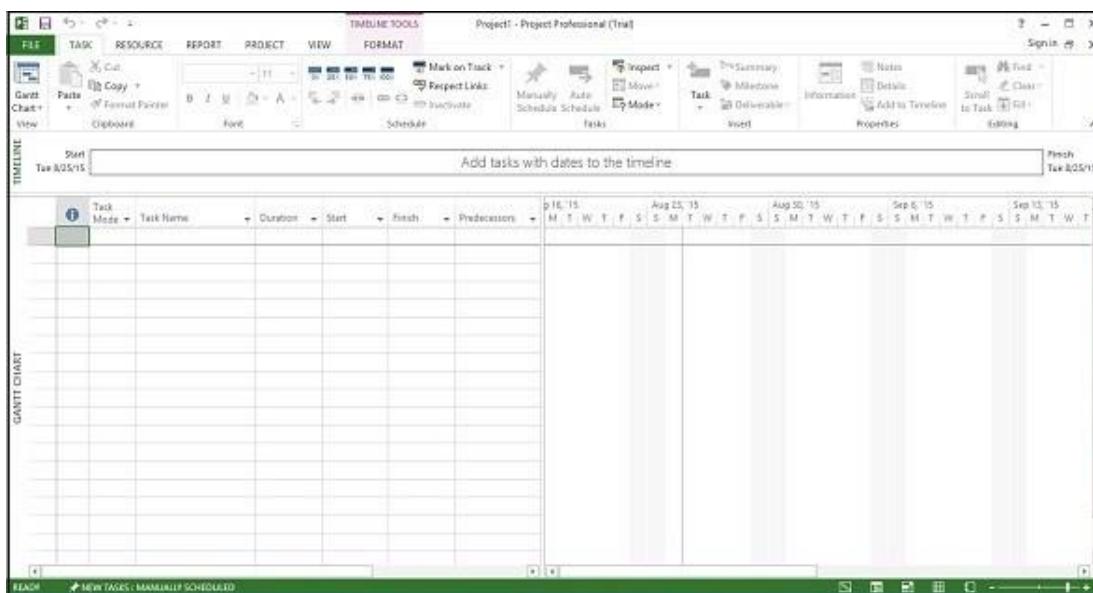
- Learn how to create a new project plan
- Learn how to set calendar
- Add exception to the calendar
- Set resource calendar
- Add working and non-working days.
- Learn to build task list
- Learn what is a duration and different ways to enter duration in MS Project
- Learn how to change default time dimensions
- Learn what is elapsed duration

Create Blank Project

MS Project 2013 will display a list of options. In the list of available templates, click Blank Project.



Project sets the plan's start date to current date, a thin green vertical line in the chart portion of the Gantt Chart



View indicates this current date.



Project Information

Let us change the project start date and add some more information.

Step 1: Start Date

Click Project tab → Project Information.

A dialog box appears. In the start date box, type the date, or click the down arrow to display the calendar, select any date of your choice.

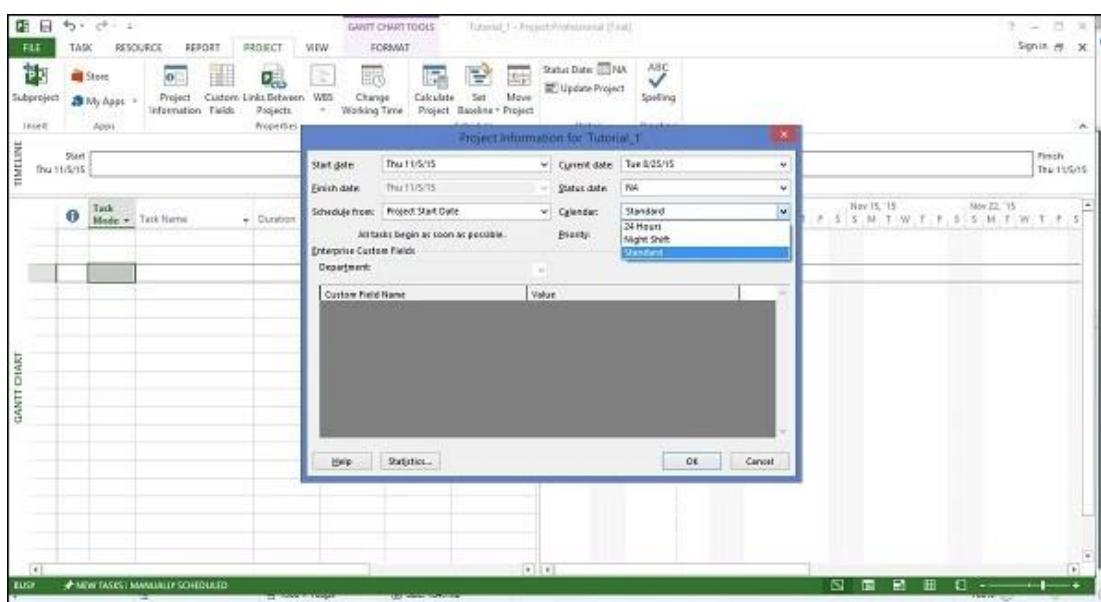
Click OK to accept the start date.

Step 2: Set Up Calendar

Click Project tab → Project Information.

Click the arrow on the Current Date dropdown box. A list appears containing three base calendars.

- 24 Hour – A calendar with no non-working time.
- NightShift – Covers 11PM to 8 AM, night shifts covering all nights from Monday to Friday, with one hour breaks.
- Standard – Regular working hours, Monday to Friday between 8 AM to 5 PM, with one hour breaks.





Select “Standard Calendar” as your project Calendar.

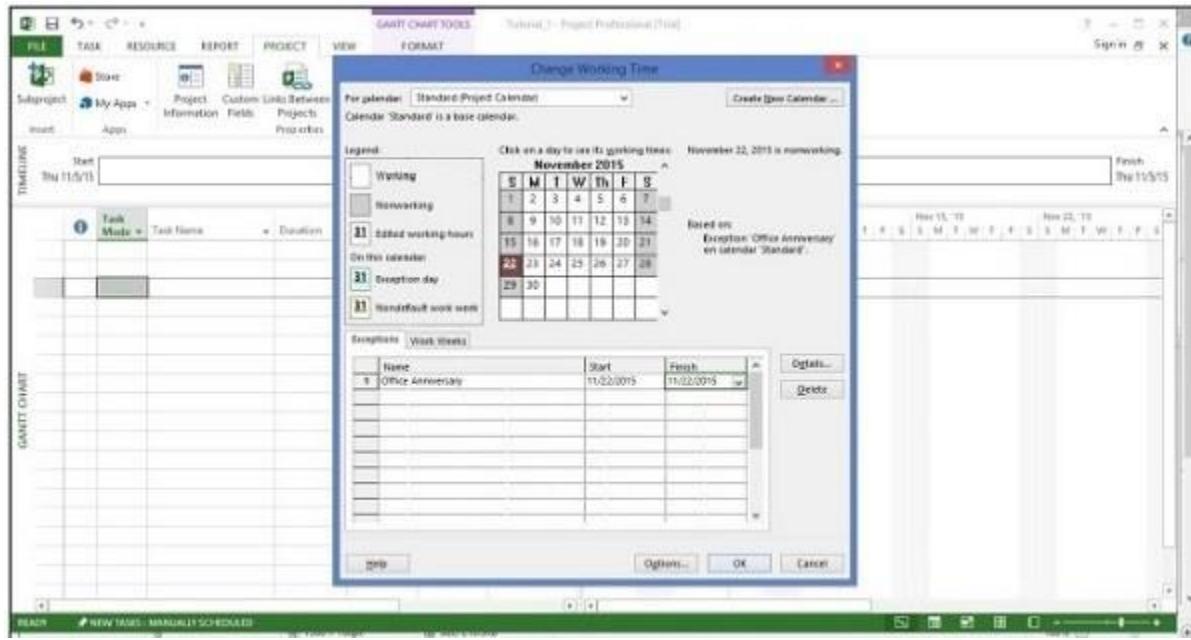
Step 3: Adding Exceptions to Calendar

Exceptions are used to modify a Project calendar to have a non-standard workday or a non-working day. You can also allot unique working hours for a particular resource as well.

Here is an example to create a non-working day, which could be because of a holiday or office celebrations or events other than the standard office work effort.

Click Project tab → Change Working Time.

Change Working Time dialog box appears. Under Exceptions Tab click on the Name Field, enter event as “Office Anniversary”. In the Start field enter the date, and then enter the same date in the Finish field. This date is now scheduled as a non-working day for the project. You can also verify the changed color indicated in the calendar within the dialog box as below. Click Ok to close.





Step 4: Setting up Resource Calendar

Just like you can change a Standard Base Calendar, you can change the work and non-working time for each resource. You can modify the resource calendar to accommodate vacation time, training time, etc.

Also remember, Resource Calendar can only be applied to work resources and not to material and cost resources.

By default, when we create the resources in a plan, the resource calendar matches the Standard base calendar. And any changes you make to the Project Calendar, gets reflected automatically in resource calendars, except when you create an exception in the resource calendar. In that case even if you update the project calendar, the exception in resource calendar is not affected.

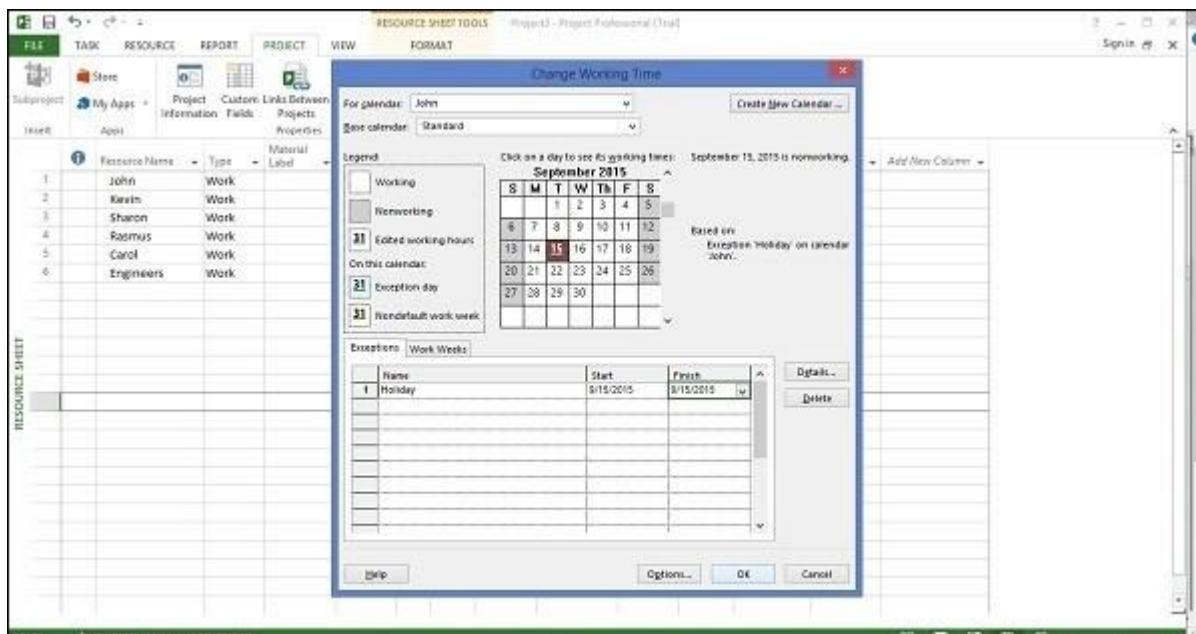
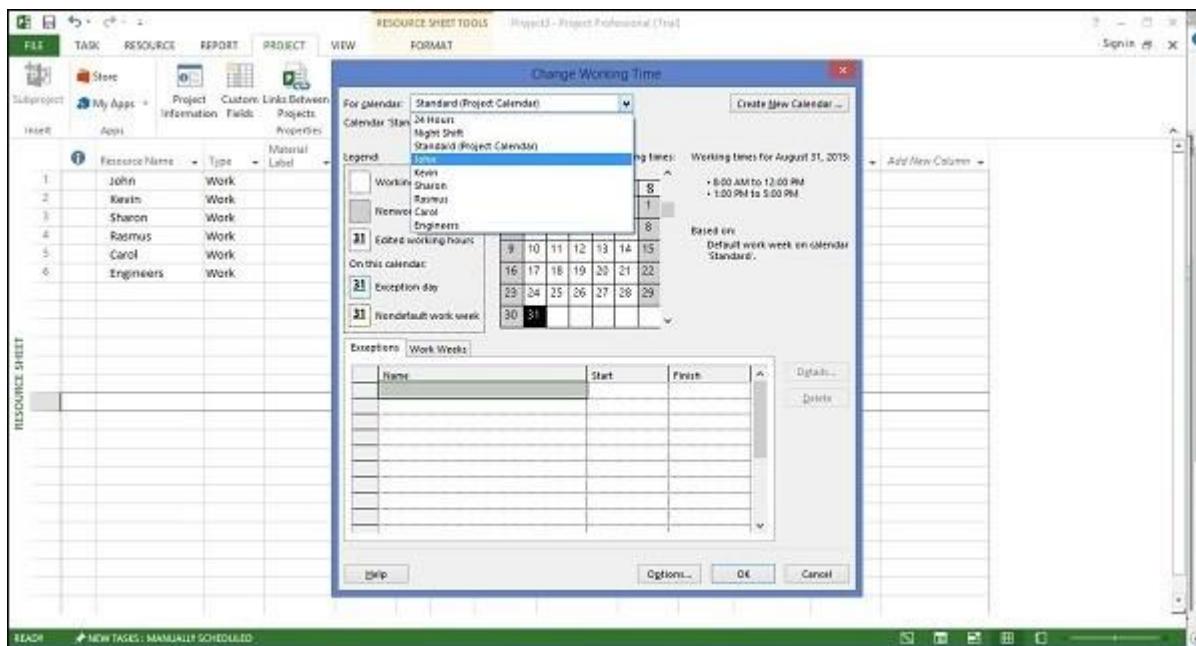
Click Project tab → Click Change Working Time Change Working

Time dialog box appears.

Click the down arrow **for** the “**For Calendar**” drop-down box.

Select the resource **for** whom you want to create an exception. **In** example below I have chosen John

Under Exceptions Tab click on the Name Field, enter events as “Personal holiday”. In the Start field enter the date and then enter the same date in the Finish field.





Step 5: Change Working times for Each Resource

Click Project tab → Click Change Working Time.

The Change Working Time dialog box appears.

Click the down arrow for the “For Calendar” dropdown box.

Select the resource for whom you want to change work schedule.

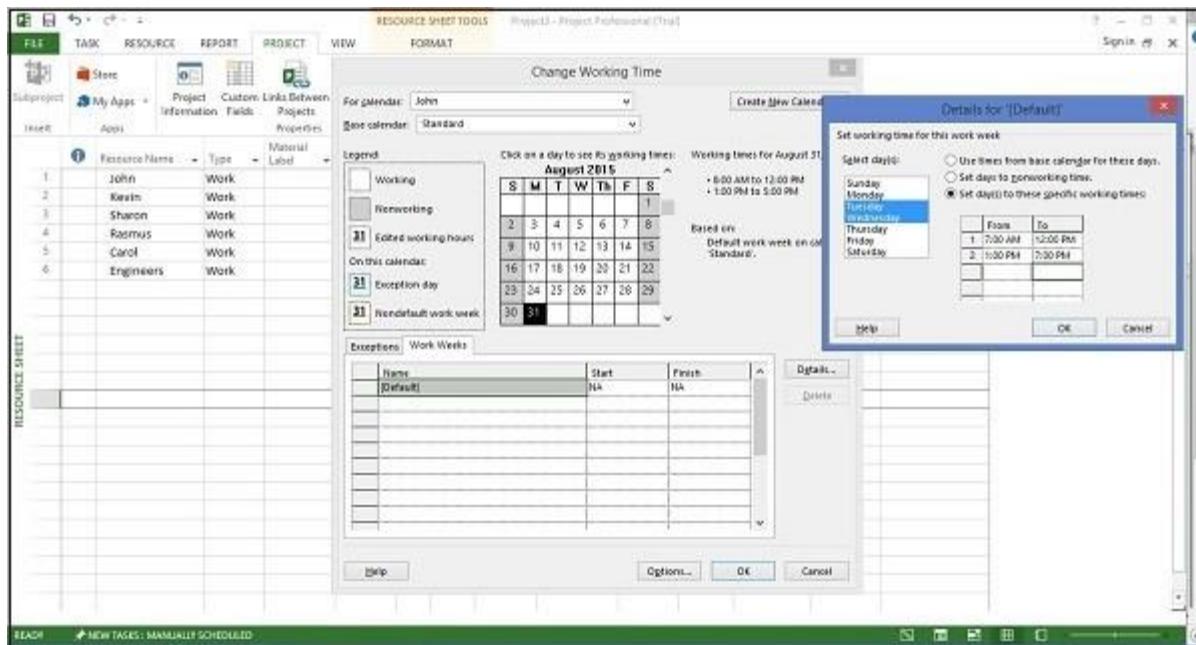
In the following screen you can see we have chosen John.

Click “Work Weeks” tab.

Double-click the [default] cell below the Name column heading.

Under “Selected Day(s)” choose any day you want to change the work schedule. We have chosen Tuesday and Wednesday.

Click Set day(s) to these specific working times. Change the time.



Step 6: Create Non-working Days

Click Project tab → Click Change Working Time.

The Change Working Time dialog box appears.

Click the down arrow for the “For Calendar” dropdown box.

Select the resource for whom you want to change work schedule. We have chosen John again.

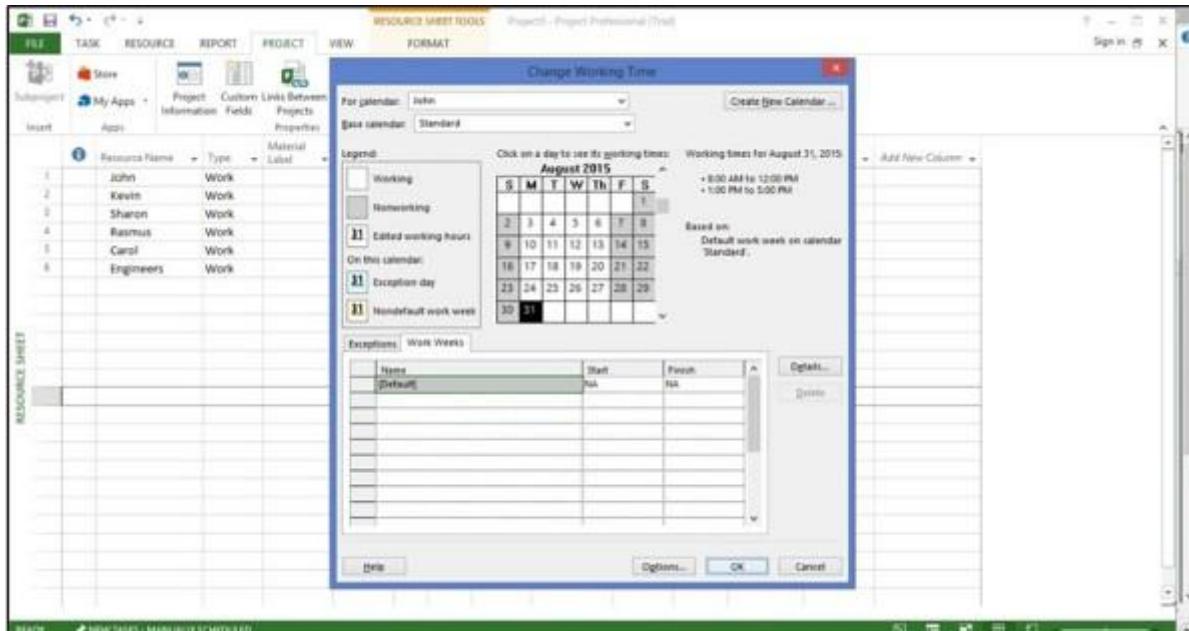
Click “Work Weeks” tab.

Double-click the [default] cell below the Name column heading.

Under “Selected Day(s)” choose any day you want to change the work schedule.

Click any day (we have chosen Friday) and use the radio button “Set days to nonworking time”.

Click OK to close the Dialog box. You will now see all Fridays are greyed out in the calendar.



Enter Task

This is simple. In Gantt Chart View, just click a cell directly below the Task Name column. Enter the task name. In the following screen, we have entered 5 different tasks.

Task	Task Name	Duration	Start	Finish	Predecessors
1	Test Task 1				
2	Test Task 2				
3	Test Task 3				
4	Test Task 4				
5	Test Task 5				



Enter Duration

A duration of the task is the estimated amount of time it will take to complete a task. As a project manager you can estimate a task duration using expert judgment, historical information, analogous estimates or parametric estimates.

You can enter task duration in terms of different dimensional units of time, namely minutes, hours, days, weeks, and months. You can use abbreviations for simplicity and ease as shown in the following table.

Value you want to enter	Abbreviation	Appearance
45 minutes	45 m	45 mins
2 hours	2h	2 hrs
3 days	3d	3 days
6 weeks	6w	6 weeks
2 months	2mo	2 mons

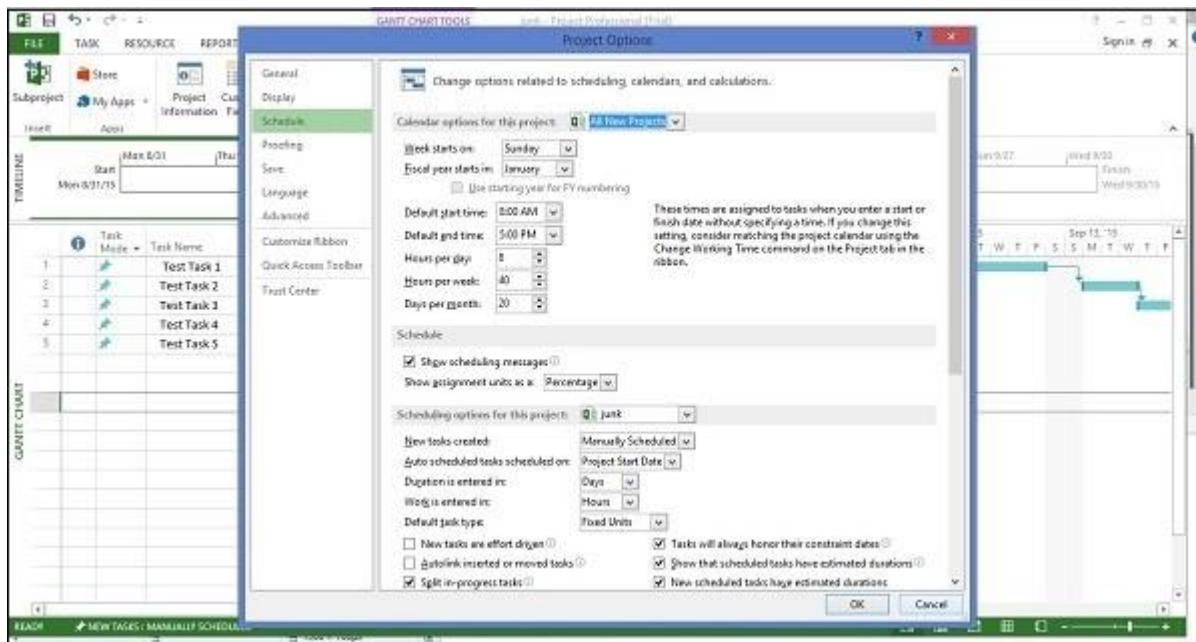
Remember, Project default values depend on your work hours. So 1 day is not equivalent to 24 hours but has 8 hours of work for the day. Of course, you can change these defaults anytime you want.

Value entered	Value	Project default Value
1 minute	60 seconds	60 seconds
1 hour	60 minutes	60 minutes
1 day	24 hours	8 hours (1 workday)
1 week	7 days	40 hours (5 workdays)
1 month	28 to 31 days	160 hours (20 workdays)



Change Default Time Dimensions

Click Project tab → Properties Group → Click Change Working Time → Click Options. You can apply this to all projects or a specific project that you are working on currently.



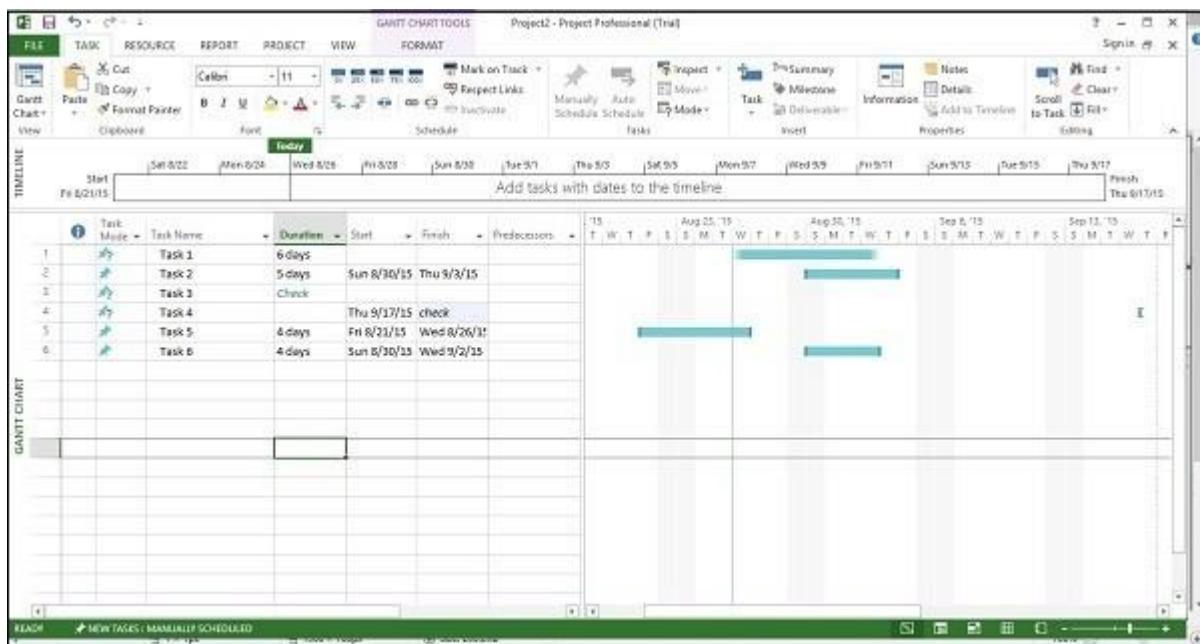
One of the neat tricks MS Project possesses is, it considers duration of the task in workday sense. So if you have a non-working day in between, it accommodates this and ensures a task that takes 16 hours to complete to end on the 3rd day. In other words, if you have a task that needs 16 hours to complete starting on Monday 8:00 AM (if this is the time your work day starts, and 8 hours being total work hours in a day), and Tuesday being a holiday, the task will logically end on the evening of Wednesday.

Tip – With manually scheduled tasks, if you are not sure about a task duration, you can just enter text such as “Check with Manager/Engineer” to come back to this later.



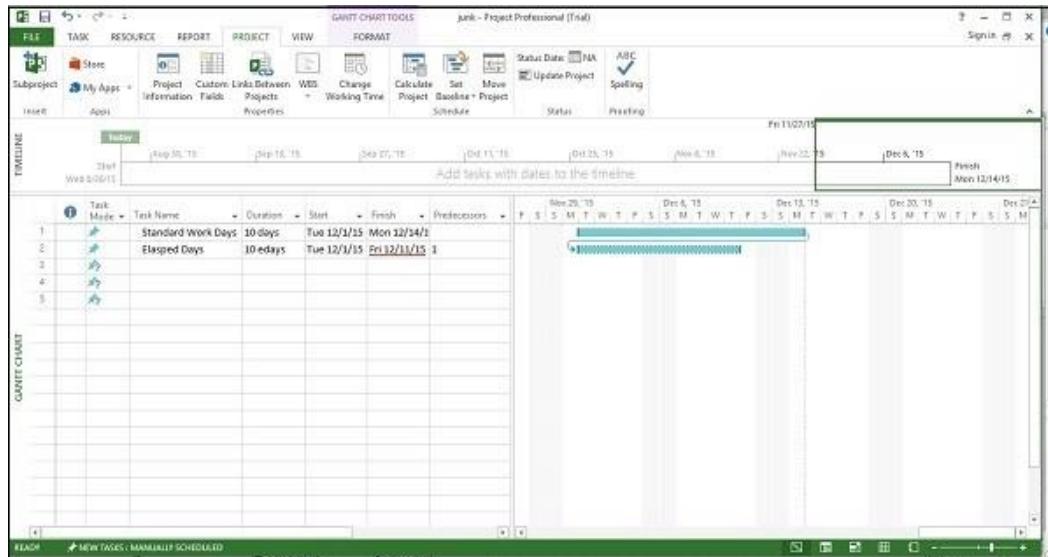
Enter Task Duration

- This is simple in Gantt Chart View, click the cell below Duration column heading. Enter the duration. (Task 1 in the following screenshot)
- You can also enter Start and Finish date and MS Project will calculate the duration on its own. (Task 2 in the following screenshot)
- You can enter text as well when you don't have a duration metric currently. (Task 3 and Task 4 in the following screenshot)



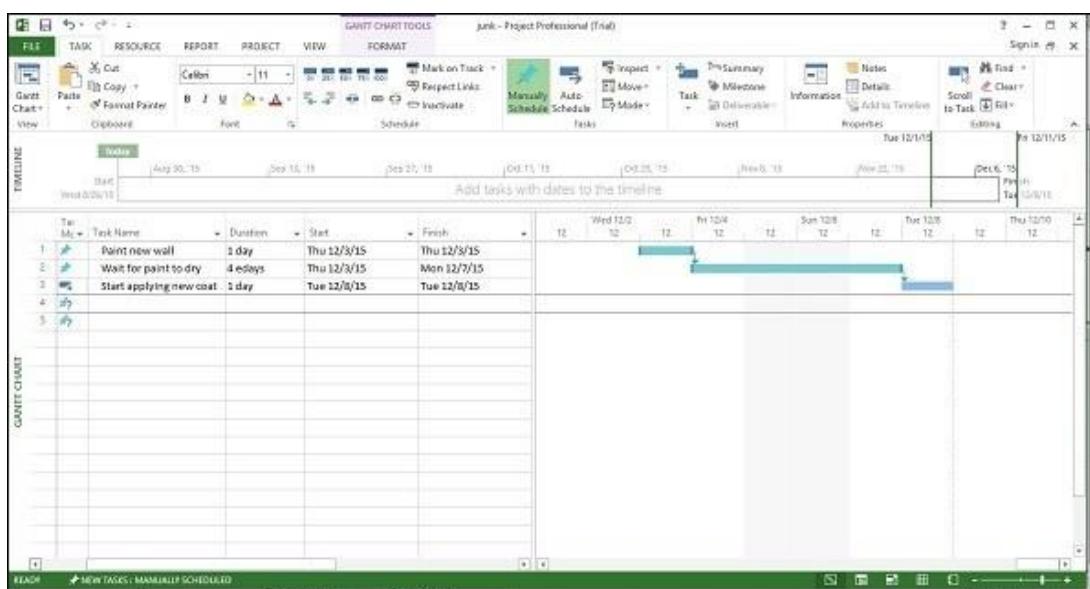
Elapsed Duration

Elapsed Duration is the time that elapses while some event is occurring which does not require any resources. Elapsed duration for a task can be used in instances where a task will go on round-the-clock without any stoppage. A normal workday has 8 hours, and an elapsed day duration will have 24 hours. The task also continues over non-working (holidays and vacations) and working days.



You can enter elapsed duration by preceding any duration abbreviation with an “e”. So 1ew is seven 24-hour days.

For example, when you are ‘Waiting for the paint to dry’. And it takes 4 days for this to happen. It does not need a resource or a work effort, and all you are doing is waiting for it to dry. You can use 4ed as the time duration, which signifies 4 elapsed days, the paint can dry regardless of whether it is a weekend or if it falls on a holiday. Here in this example, the drying occurs over 24 hours over the weekend.





Lab Task

Implement above explained steps on the Gantt chart view created in the previous lab, set up your calendar add exception, set up resource calendar and add working and non-working days.

Lab 5

Build Tasks

Introduction: Learn to build task lists and links between tasks.

Problem Statement:

- Learn to create milestones
- Learn different types of task dependencies and how to implement them
- Learn how to create respect links for your tasks.



Create Milestones

In Project Management, Milestones are specific points in a project timeline. They are used as major progress points to manage project success and stakeholder expectations. They are primarily used for review, inputs and budgets.

Mathematically, a milestone is a task of zero duration. And they can be put where there is a logical conclusion of a phase of work, or at deadlines imposed by the project plan.

- Simply put, it's a reference point that marks a major event
- Milestones do not impact project duration

There are two ways you can insert a milestone.

Method 1: Inserting a Milestone

Click name of the Task which you want to insert a Milestone

Click Task tab → Insert group → Click Milestone.

MS Project names the new task as <New Milestone> with zero-day duration.

Click on <New Milestone> to change its name.

You can see the milestone appear with a rhombus symbol in the Gantt Chart View on the right.

Method 2: Converting a Task to a Milestone

Click on any particular task or type in a new task under the **Task Name** Heading.

Under **Duration** heading type in “0 days”.

MS Project converts it to a Miles



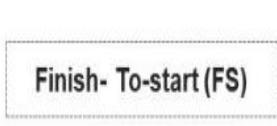
Link Tasks

Once you have a list of tasks ready to accomplish your project objectives, you need to link them with their task relationships called dependencies. For example, Task 2 can start once Task 1 has finished. These dependencies are called Links.

- In MS Project, the first task is called a predecessor because it precedes tasks that depend on it.
- The following task is called the successor because it succeeds, or follows tasks on which it is dependent.

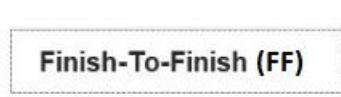
There are only four types of task dependencies, here we present them with examples.

- Finish to Start (FS) – Finish the first floor before starting to build the second floor. *Most used.*



- Task (B) Cannot Start Until Another Task (A) Finishes.

- Finish to Finish (FF) – Testing for S/W module will finish only once you have finished writing code for



- Task (B) Cannot finish Until Another Task (A) Finishes.

that module.

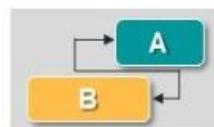
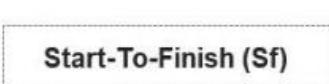
- Start To Start (SS) – When doing a survey, we would seek survey responses but will also start tabulating the responses. One does not have to finish collecting survey response before starting the tabulation.



- Task (B) Cannot Start Until Another Task (A) Starts.

- Start to Finish (SF) – Exam preparation will end when exam begins. *Least used.*

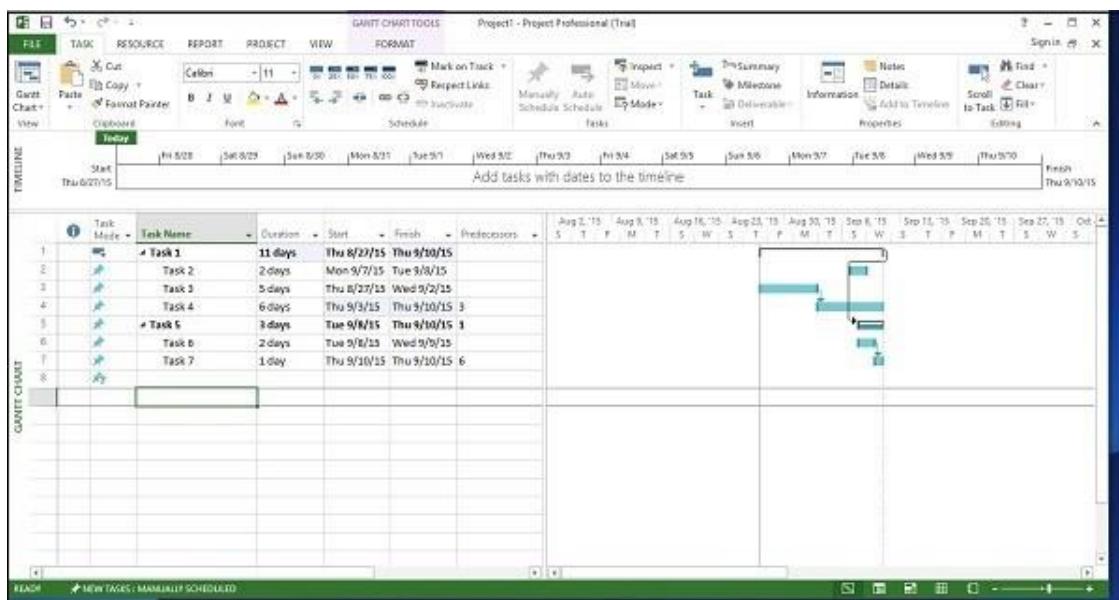
- Duty of morning guard cannot finish until duty of evening guard starts.



- Task (B) Cannot finish Until Another Task (A) Starts.

Respect Links

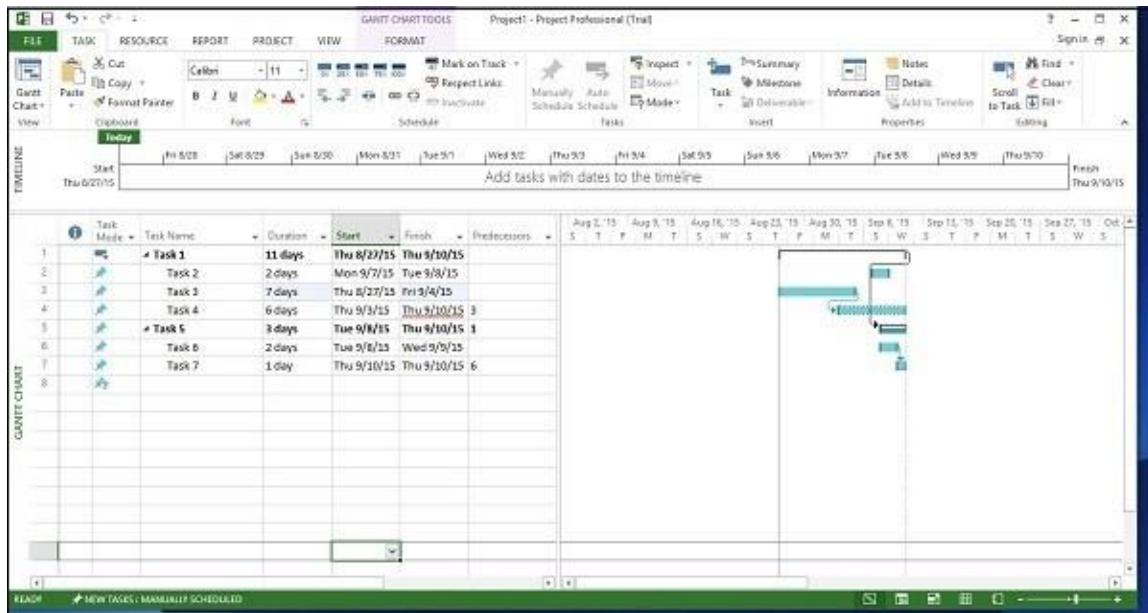
If you are in Manually Scheduled mode, any change in duration of the predecessor task will not reflect on Start date of Task 4. For example, Task 4 starts on 9/3/20 which is the next day of Finish date of Task 3.



Now when we change the Duration of Task 3 from 5 to 7 days, the start date is not automatically updated for Task 4 in Manual Scheduling.

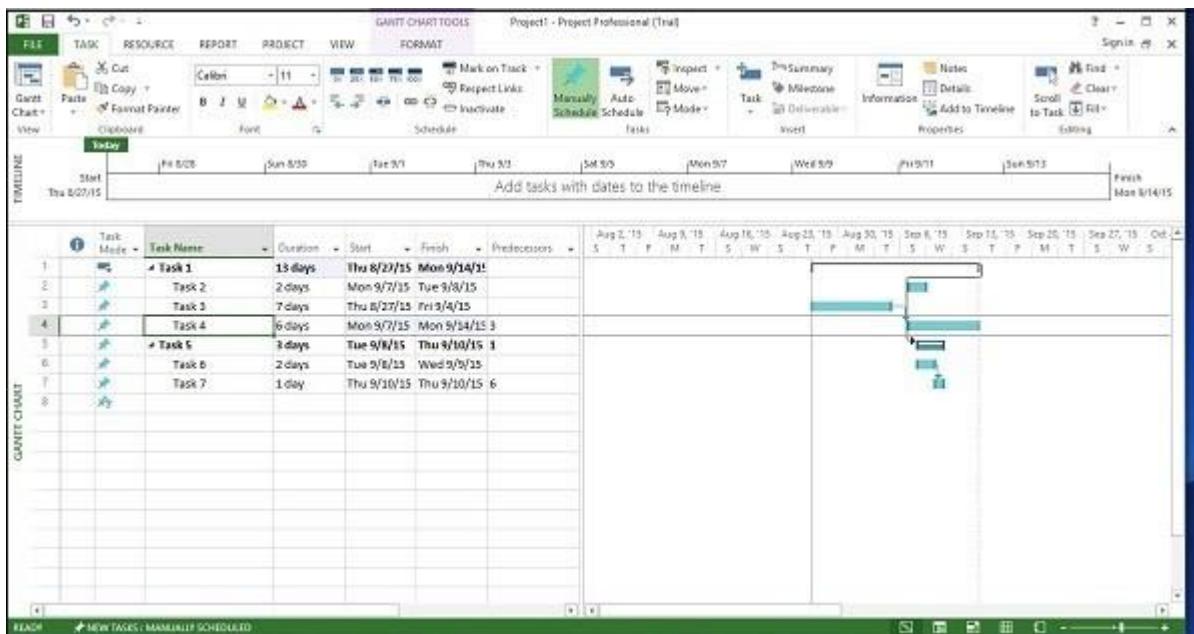


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You can force MS Project to respect the link (dependency) by doing the following –

- Select task 4
- Click Task tab → Schedule group → Respect Links.





Lab Tasks

Create milestones for your Project.

Try out different dependency links, implement wherever you think is appropriate.

Create Respect links.

Lab 6 & 7

Setup Resources

Introduction: set up resources in MS Project.

Problem Statement:

- Learn what are different types of resources and how to enter their names
- Learn what is max capacity
- Learn resources as group and as part time
- Learn how to add notes to resources
- Learn how to set up cost



Resource Types

Work resources – People and equipment to complete the tasks.

- Cost resources – Financial cost associated with a task. Travel expenses, food expenses, etc.
- Material resources – Consumables used as project proceeds. For example, paint being used while painting a wall, office stationery

Note – *Be aware of the crucial difference between People and Equipment resources. People resources will have limited work hours, say 6, 8 or 12 hours. Equipment resources have different working capacities of 2, 8 or 24 hours and could have maintenance breaks as well. Also note, that it is possible multiple people resources might be using one equipment resource, or one equipment might be accomplishing multiple tasks.*

Task1-Enter Work Resource Names

You can enter resource names according to your convenience.

Resource	Example
Work resource as an identified person	John, Kevin
Work resource as a job function or group	Engineer, Coordinator, Typist
Work resource as an equipment	Computers, cpu, hard-drive

Steps involved

Click View tab → Resource Views group → Click Resource Sheet.

Click the cell directly below the Resource Name heading column.

Enter Resources as an individual person, job function or group.



By default, the Max Units field is set to 100%.

A screenshot of the Microsoft Project Professional software interface. The window title is "RESOURCE SHEET TOOLS Project1 - Project Professional (Trial)". The menu bar includes FILE, TASK, RESOURCE, REPORT, PROJECT, and VIEW. The ribbon tabs show "Resource Sheet" is selected. The main area displays a table titled "Resource Sheet" with the following data:

	Resource Name	Type	Material Label	Initials	Group	Max Units	Std. Rate	Dvt. Rate	Cost/Hr.	Actual	Base Calendar	Code	Add New Column
1	John	Work	J			100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard		
2	Karim	Work	K			100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard		
3	Sharon	Work	S			100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard		
4	Rasmus	Work	R			100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard		
5	Carol	Work	C			100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard		
6	Engineer	Work	E			100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard		

RESOURCE SHEET



Resource Max Capacity

Max Units field represents the maximum capacity of a resource to work on assigned tasks. 100% stands for 100 percent of resource's working time is available for work on task assigned. The resource is available full-time on each workday. If the resource gets allocated to task or tasks that would require more than his/its work hours, the resource is over allocated and MS Project will indicate this in red formatting.

If a resource does not represent an individual person but a job function, where a group of people with the same skill set can work on the task, we can enter larger Max Units to represent the number of people in the group. So 400% would indicate, 4 individual people working full-time every workday.

Work Resources as a Group

Click View tab → Resource Views group → Click Resource Sheet

Click the cell directly below Resource Name heading column

Enter Resources as group, here we take an example of Engineers.

Click the Max. Units field for the Engineers resource.

Type or select 400%. Press Enter.



The screenshot shows the Microsoft Project Professional interface with the 'RESOURCE SHEET' tab selected. The timeline at the top indicates a start date of Feb 28, '21 and an end date of Mar 7, '21. Below the timeline, there is a table titled 'Add tasks with dates to the timeline'. The table has columns for Resource Name, Type, Material, Initials, Group, Max. Units, Std. Rate, Ovt. Rate, Cost/Unit, Accrue, and Base. The data in the table is as follows:

	Resource Name	Type	Material	Initials	Group	Max. Units	Std. Rate	Ovt.	Cost/Unit	Accrue	Base
1	ahmad	Work		a		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
2	hamza	Work		h		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
3	asad	Work		a		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
4	amy	Work		a		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
5	hafsa	Work		h		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
6	anum	Work		a		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
7	zainab	Work		z		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
8	abdullah	Work		a		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
9	Engineer	Work		E		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
10	development team	Work		d		400%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard

Work Resource as Part-time

Entering a value less than 100% in Max.Units would mean you expect the resource capacity to be lower than a full-time resource. So 50% would mean the individual works for half of the normal full capacity, so if a normal work week is 40 hours, this equals 20-hour capacity.

Click View tab → Resource Views group → Click Resource Sheet.

Click the cell directly below Resource Name heading column.

Enter Resource as an individual or job function. Here let's take an example. For Ramsus I have entered 50%.

The screenshot shows the Microsoft Project Professional interface with the 'RESOURCE SHEET' tab selected. The table has a highlighted cell in the 'Max. Units' column for the 5th row (Ramus). The data in the table is as follows:

	Resource Name	Type	Material	Initials	Group	Max. Units	Std. Rate	Ovt. Rate	Cost/Unit	Accrue	Base
1	John	Work		J		200%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
2	Karim	Work		K		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
3	Sharon	Work		S		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
4	Ramus	Work		R		50%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
5	Carol	Work		C		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
6	Engineers	Work		E		400%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard



Task2-Enter Resource Cost

You can enter standard rates and costs per use for work and material resources. You can also enter overtime rates for work resources. Standard rates are calculated on per hour basis. Costs per use on the other hand are costs that do not vary with task. Cost per use is a set fee used up to complete a task. There are three types of resources – work, material, and cost.

- Work resources – People and equipment to complete the tasks.
- Costresources – Financial cost associated with a task. Travel expenses, food expenses, etc.
- Material resources – Consumables used as project proceeds. Like paint being used while painting a wall.

Cost resources do not use pay rates. Remember cost per use and cost resources are two different things. Cost resources are financial cost associated with a task, like travel expenses, food expenses, etc. The cost value of cost resource is only assigned when you assign cost resource to a task.

Project calculates the cost of a task by using this formula –

Cost of Task = Work Value (in number of hours) x Resource's Pay Rate.

To enter standard and overtime pay rates for work resources –

Click View tab → Resource Views group → **Resource Sheet**.

Click the cell directly below Resource **Name** heading column to **create** Resources.

Click the **Std. Rate field** for each resource to costs in **hourly (default), daily, weekly, monthly and yearly rates**.

In the following example, the resource Rasmus is left at zero. This is useful when you don't have to track rate-based costs for some resources.



Click the Ovt. Rate field to enter overtime rates.

	Resource Name	Type	Last	Initials	Max. Units	Std. Rate	Ovt. Rate	Cost/Unit	Accrual	Basis	Calendar	Code	Add New Column
1.	John	Work	J		100%	\$40.00/hr	\$60.00/hr	\$8.00	Prorated	Standard			
2.	Kerstin	Work	K		50% 000.00/wk	\$0.00/hr	\$0.00	\$0.00	Prorated	Standard			
3.	Sharon	Work	S		100%	\$60.00/hr	\$0.00/hr	\$0.00	Prorated	Standard			
4.	Rasmus	Work	R		50%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard			
5.	Carol	Work	C		100%	\$50.00/hr	\$0.00/hr	\$0.00	Prorated	Standard			
6.	Engineers	Work	E		400%	\$40.00/hr	\$0.00/hr	\$0.00	Prorated	Standard			

Add Notes to Resources

Click View tab → Resource Views group → Resource Sheet.

Double-click the Resource, a Resource Information dialog box opens.

Click on Notes tab. Here let's enter a note for Rasmus as "Rasmus will work part time". Click OK.



The screenshot shows the Microsoft Project application window. The menu bar includes FILE, TASK, RESOURCE, REPORT, PROJECT, VIEW, and FORMAT. The ribbon tabs are RESOURCE SHEET, TOOLS, and Project Professional (Trial). The main area displays a Resource Sheet with six rows of data:

	Resource Name	Type	Material Label	Initials	On	Max. Units	Std. Rate	Ovt. Rate	Cost/Hr	Accrued At	Base Calendar	Code	Add New Columns
1	John	Work		J		100%	\$40.00/hr	\$40.00	\$0.00	Prorated	Standard		
2	Karin	Work		K		30%	\$60.00/hr	\$60.00	\$0.00	Prorated	Standard		
3	Sharon	Work		S		100%	\$60.00/hr	\$60.00	\$0.00	Prorated	Standard		
4	Rasmus	Work		R		50%	\$60.00/hr	\$60.00	\$0.00	Prorated	Standard		
5	Carol	Work		C		100%	\$50.00/hr	\$50.00	\$0.00	Prorated	Standard		
6	Engineers	Work		E		400%	\$40.00/hr	\$40.00	\$0.00	Prorated	Standard		

A tooltip appears over the Rasmus row, displaying the note: "Rasmus will work part-time". A callout bubble from the note icon in the Resource Sheet shows the "Resource Information" dialog box with the "Notes" tab selected, containing the same note text.

A note icon now appears to the left of Rasmus' name in the Resource Sheet view. Hovering over it will make the note appear.

The screenshot shows the Microsoft Project application window with the Resource Sheet view. The Resource Information dialog box is still open, showing the "Notes" tab with the text "Rasmus will work part-time". The Resource Sheet table below shows the same data as the previous screenshot, with the Rasmus row highlighted. The status bar at the bottom indicates "READY NOW FASIS: MANUALLY SCHEDULED".

	Resource Name	Type	Material Label	Initials	On	Max. Units	Std. Rate	Ovt. Rate	Cost/Hr	Accrued At	Base Calendar	Code	Add New Columns
1	John	Work		J		100%	\$40.00/hr	\$40.00	\$0.00	Prorated	Standard		
2	Karin	Work		K		30%	\$60.00/hr	\$60.00	\$0.00	Prorated	Standard		
3	Sharon	Work		S		100%	\$60.00/hr	\$60.00	\$0.00	Prorated	Standard		
4	Rasmus	Work		R		50%	\$60.00/hr	\$60.00	\$0.00	Prorated	Standard		
5	Carol	Work		C		100%	\$50.00/hr	\$50.00	\$0.00	Prorated	Standard		
6	Engineers	Work		E		400%	\$40.00/hr	\$40.00	\$0.00	Prorated	Standard		



Lab Task

Case: It's a project where a company is moving to a new office space, and we are in charge of planning the move, including getting office furniture and all office stuff shipped to the new location. And we want to do this without interfering with daily business. People should be able to do their work, then on the weekend all items will be transferred, so that your colleagues can start working from the new office building the following Monday.

Key project data: • Goal: Office relocation • Timeline: March – October • Project phases: Project preparation, Selection of offices, Space design and furnishing, Physical relocation

- Build task list
- Enter task links
- Create sub tasks
- Set up base calendar and resource calendar
- Create milestones

Lab 8 & 9

Assign resources to tasks

Introduction: assign resources to tasks

Problem Statement:

- Learn how to set cost and material resources
- Learn different methods of how to assign material & cost resources to tasks
- Learn how to assign multiple resources to a single task.
- Learn how to assign cost resources to tasks.

Set Up Cost Resources

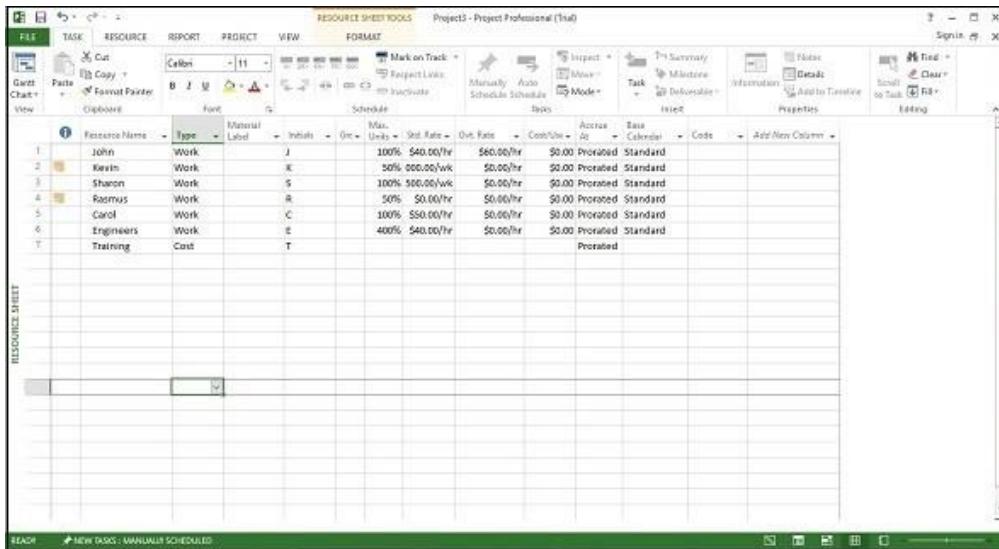
You can use a cost resource to represent a financial cost associated with a task in a plan. Common types of cost resources might include categories of expenses you want to track in a plan for accounting or financial reporting purposes, such as travel, entertainment, or training. **Cost resources do no work and have no effect on the scheduling of a task. The Max. Units, Standard and Overtime pay rate, and Cost per Use fields do not apply to cost resources.** After you assign a cost resource to a task and specify the cost amount per task, you can then see the cumulative costs for that type of cost resource, such as total travel costs in a project. The way in which cost resources generate cost values differs from that of work resources. When you assign a work resource to a task, the work resource can generate a cost based on a pay rate. **However, you enter the cost value of a cost resource only when you assign it to a task.** You do this in the task.

Click View tab → Resource Views group → Resource Sheet.

Click the empty cell in the Resource Name column.

Type Training and press the Tab Key.

In the Type field, click the down arrow to select Cost.



Resource Name	Type	Material	Initials	Max.	Unit	Std. Rate	Ovt. Rate	Cost/Unit	Accrue	Base	Code	Add New Column
John	Work	J		100%	\$40.00/hr	\$40.00/hr	\$0.00	Prorated	Standard			
Kevin	Work	K		50%	\$100.00/wk	\$100.00/wk	\$0.00/hr	\$0.00	Prorated	Standard		
Sharon	Work	S		100%	\$100.00/wk	\$100.00/wk	\$0.00/hr	\$0.00	Prorated	Standard		
Rasmus	Work	R		50%	\$50.00/hr	\$50.00/hr	\$0.00/hr	\$0.00	Prorated	Standard		
Carol	Work	C		100%	\$50.00/hr	\$50.00/hr	\$0.00/hr	\$0.00	Prorated	Standard		
Engineers	Work	E		400%	\$40.00/hr	\$40.00/hr	\$0.00/hr	\$0.00	Prorated	Standard		
Training	Cost	T										Prorated



Once the task and resource list are complete, resources need to be assigned to tasks in order to work on them. With MS Project you can track task progress, resource and tasks costs.

Assign Cost Resource to Tasks

Click View Tab → Gantt Chart View → Task Name column.

Double-click the Task Name. Task Information dialog box opens.

Click the Resources tab.

Click the cell below the Resource Name column. Select the resource from the dropdown list.

In the following example below, let's choose "Travel" as cost resource and enter the cost at \$800.

The screenshot shows the Microsoft Project application interface. The main window displays a Gantt chart with tasks like Assign_Resources, Phase 1, DT2, DT3, DT4, Milestone 1, Phase 2, AT1, and AT2. Task PT3 is selected. A 'Task Information' dialog box is open over the Gantt chart, specifically on the 'Resource' tab. In the 'Resource' list, 'Travel' is selected, and its cost is set to '\$800.00'. The Gantt chart shows the duration of task PT3 as 7 days, starting on Wednesday, 1/7/15, and ending on Tuesday, 13/7/15.



Assign Material Resource to Task

Method 1

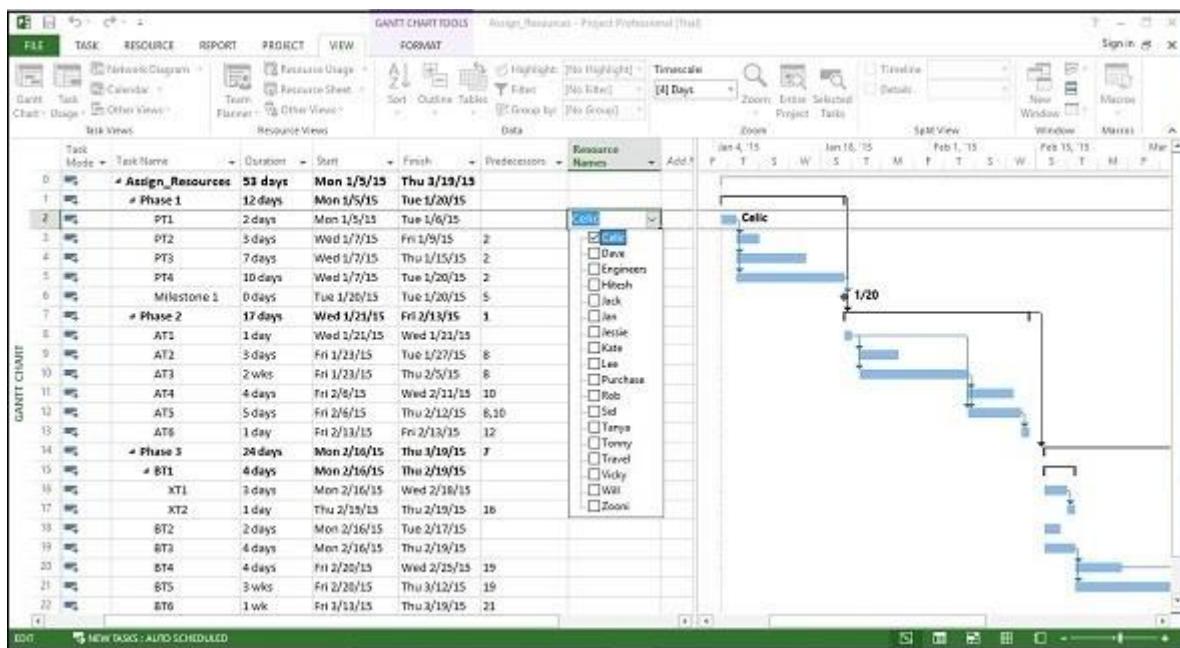
Click View Tab → Gantt Chart View → Resource Name column.

Click the box below the Resource Name column for the task you need the resource to be assigned.

From the dropdown, choose the resource name. In the following screenshot as an

example. For Task 1 "PT1", we have chosen the resource "Celic".

You can also select multiple resources to work on a single task.





Method 2

Click Resource tab → Under Assignments group → Assign Resources.

In the Assign Resources dialog box, click the resource name you like to assign.

Here let's choose "Hitesh". Now click the Assign button.

You can also select multiple resources to work on a single task.

The screenshot shows the Microsoft Project Professional interface. The Gantt Chart view displays tasks from 0 to 22. Task 0, 'Assign_Resources', is selected and has a duration of 53 days, starting on Mon 1/5/15 and ending on Thu 3/19/15. Task 1, 'Phase 1', is a sub-task of 'Assign_Resources'. Task 2, 'PT1', is a child of 'Phase 1'. Task 3, 'PT2', is a child of 'Phase 1'. Task 4, 'PT3', is a child of 'Phase 1'. Task 5, 'PT4', is a child of 'Phase 1'. Task 6, 'Milestone 1', is a child of 'Phase 1'. Task 7, 'Phase 2', is a child of 'Assign_Resources'. Task 8, 'AT1', is a child of 'Phase 2'. Task 9, 'AT2', is a child of 'Phase 2'. Task 10, 'AT3', is a child of 'Phase 2'. Task 11, 'AT4', is a child of 'Phase 2'. Task 12, 'AT5', is a child of 'Phase 2'. Task 13, 'AT6', is a child of 'Phase 2'. Task 14, 'Phase 3', is a child of 'Assign_Resources'. Task 15, 'BT1', is a child of 'Phase 3'. Task 16, 'XT1', is a child of 'Phase 3'. Task 17, 'XT2', is a child of 'Phase 3'. Task 18, 'BT2', is a child of 'Phase 3'. Task 19, 'BT3', is a child of 'Phase 3'. Task 20, 'BT4', is a child of 'Phase 3'. Task 21, 'BT5', is a child of 'Phase 3'. Task 22, 'BT6', is a child of 'Phase 3'. A 'Resource Names' list is visible on the right side of the Gantt chart, showing 'Celic', 'Hitesh', 'Lee', 'Mike', 'Natalie', 'Ravi', and 'Steve'. An 'Assign Resources' dialog box is open over the Gantt chart, showing 'Task: PT2' and a list of resources: Celic, Hitesh, Lee, Mike, Natalie, Ravi, and Steve. The 'Assign' button is highlighted in the dialog box.

Method 3

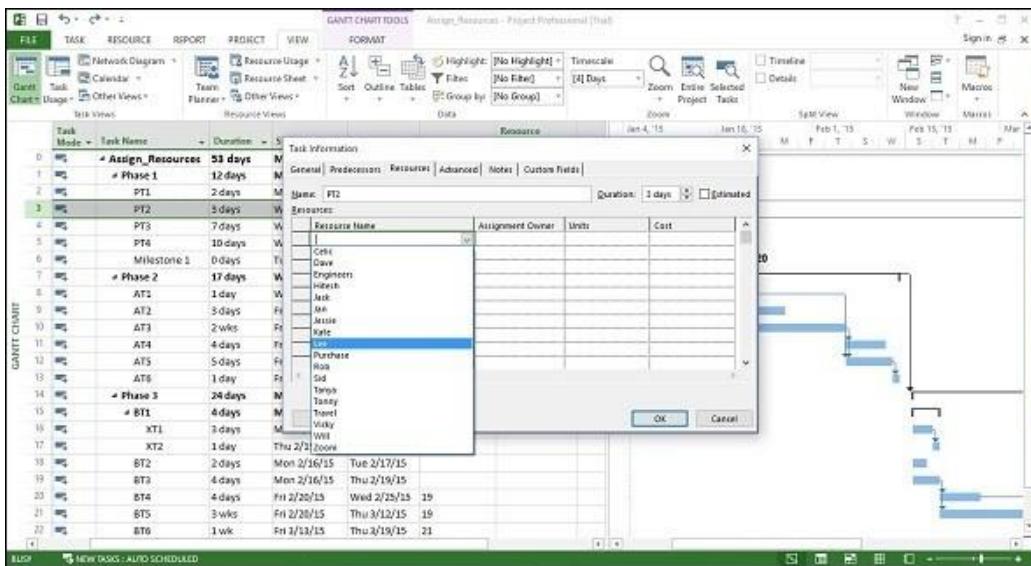
Click View Tab → Gantt Chart → Task Name column.

Double-click the Task Name. Task Information dialog box opens.

Click the Resources tab.

Click the cell below the Resource Name column. Select the resource from the dropdown list.

You can also select multiple resources to work on a single task.



Method 4

Click View Tab → Split View group → Details → Task Form.

The window is split in two, Gantt Chart view and Task Form view below it.



In the Task Form view, click under the Resource Name column and select the resource.

You can also select multiple resources to work on a single task.

The screenshot shows the Microsoft Project Professional interface. The main window displays a Gantt chart and a Task Form view. In the Task Form view, Task 1 (PT1) is selected, and its resource assignment is being edited. A small floating dialog box titled "Assign Resources" is open over the task row, showing the resource "Lee" assigned to it. The Gantt chart on the right shows the timeline from Jan 4, 2015, to Feb 15, 2015, with tasks PT1, PT2, PT3, PT4, and AT1 plotted. PT1 is shown with two bars: one for Lee and one for Celic, indicating dual assignment.

ID	Task Name	Duration	Start	Finish	Precursors	Resource Names
0	Assign_Resources	53 days	Mon 1/5/15	Thu 3/19/15		
1	PT1	2 days	Mon 1/5/15	Tue 1/6/15		Celic
2	PT2	3 days	Wed 1/7/15	Fri 1/9/15	2	Lee
3	PT3	7 days	Wed 1/7/15	Thu 1/15/15	2	
4	PT4	10 days	Wed 1/7/15	Tue 1/20/15	2	
5	Milestone 1	0 days	Tue 1/20/15	Tue 1/20/15	5	
6	Phase 2	17 days	Wed 1/21/15	Fri 2/13/15	1	
7	AT1	1 day	Wed 1/21/15	Wed 1/22/15		
8	AT2	3 days	Fri 1/23/15	Tue 1/27/15	8	



Lab Task

Define work, material and cost resources in your FYP gantt chart and assign them to tasks.

Lab 10

Plan Duration Cost and Time

Introduction: Plan duration cost and time.

Problem Statement:

- Learn how to check plan's cost
- Learn how to check plan's work
- Learn how to check project statistics

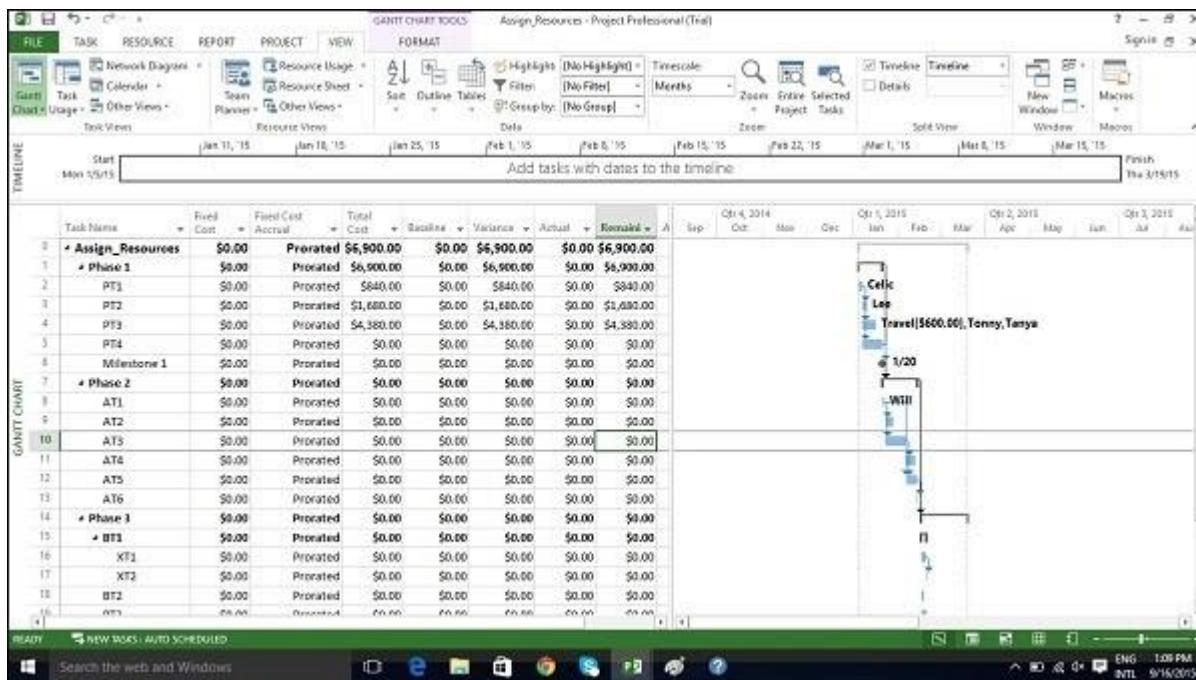


MS Project- Plan Duration Cost & Time

Check Plan's Cost

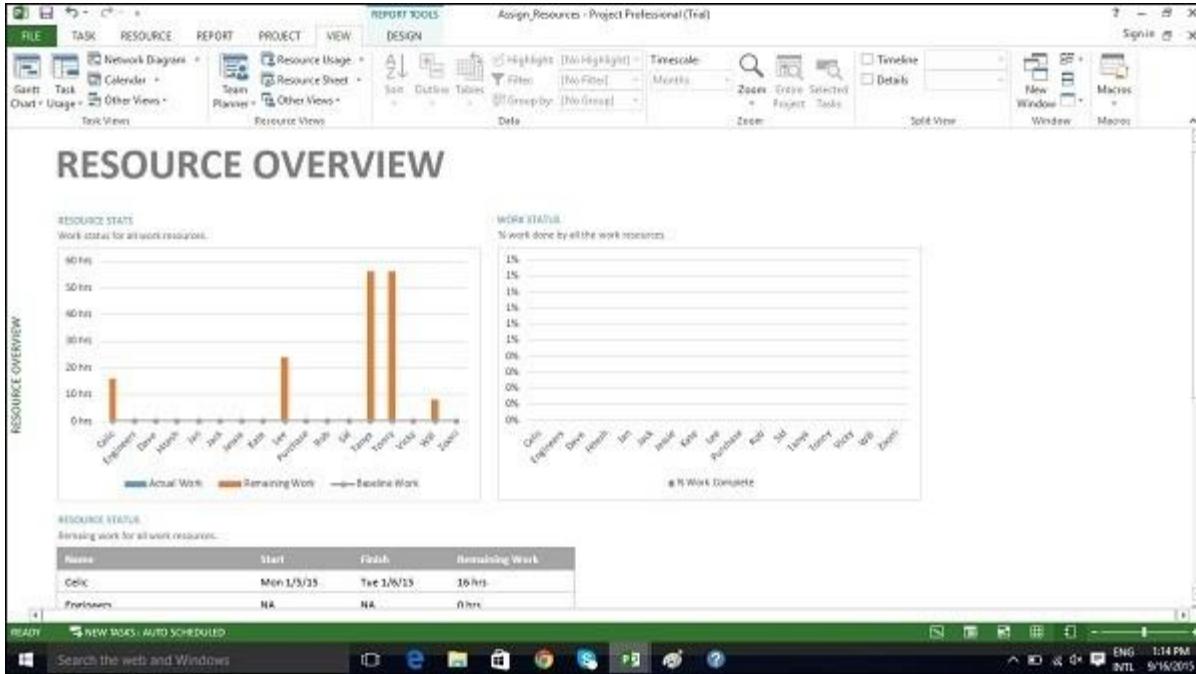
Click View tab → Data group → Tables → Cost.

Cost for each task gets rolled up into summary tasks, and then ultimately to project summary task.



Check Plan's Work

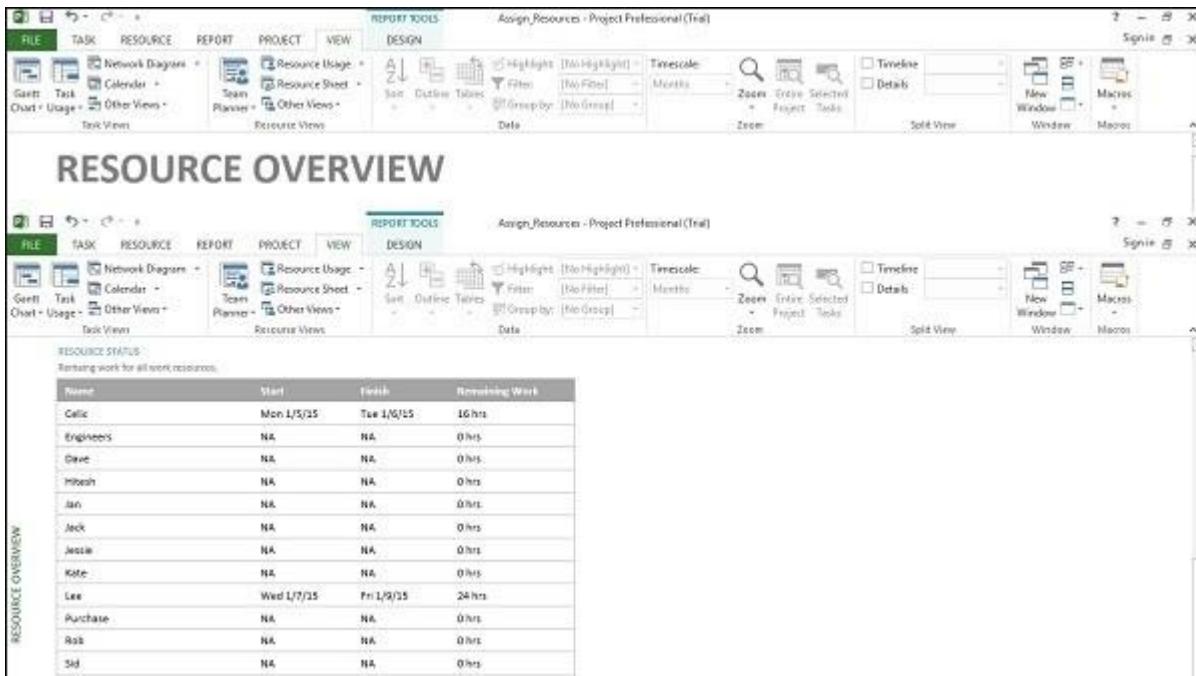
Click Report Tab → View Reports group → click Resources → click Resource overview



The screenshot shows the Microsoft Project Professional interface with the "Resource Overview" report selected. The top ribbon has tabs for FILE, TASK, RESOURCE, REPORT, PROJECT, and VIEW. The REPORT TOOLS tab is active, showing options like DESIGN, HIGHLIGHT, FILTER, GROUP BY, and DATA. The main area displays three charts: a bar chart for Resource State showing work status for all work resources, a Gantt chart for Work Status showing % work done by all the work resources, and a table for Resource Status showing remaining work for all work resources. At the bottom, there is a resource status table:

Name	Start	Finish	Remaining Work
Colic	Mon 1/5/15	Tue 1/6/15	16 hrs
Engineers	NA	NA	0 hrs
Dave	NA	NA	0 hrs
Mibash	NA	NA	0 hrs
Jan	NA	NA	0 hrs
Jack	NA	NA	0 hrs
Jessie	NA	NA	0 hrs
Kate	NA	NA	0 hrs
Lee	Wed 1/7/15	Fri 1/9/15	24 hrs
Purchase	NA	NA	0 hrs
Rob	NA	NA	0 hrs
Sid	NA	NA	0 hrs

In Resource status table which appears at the bottom, you will get a summary of resource's earliest start dates and latest finish dates as well as remaining work.



This screenshot shows the same Microsoft Project Professional interface with the "Resource Overview" report selected. The resource status table at the bottom contains the following data:

Name	Start	Finish	Remaining Work
Colic	Mon 1/5/15	Tue 1/6/15	16 hrs
Engineers	NA	NA	0 hrs
Dave	NA	NA	0 hrs
Mibash	NA	NA	0 hrs
Jan	NA	NA	0 hrs
Jack	NA	NA	0 hrs
Jessie	NA	NA	0 hrs
Kate	NA	NA	0 hrs
Lee	Wed 1/7/15	Fri 1/9/15	24 hrs
Purchase	NA	NA	0 hrs
Rob	NA	NA	0 hrs
Sid	NA	NA	0 hrs



Check Project Statistics

Click Project Tab → Properties group → Project Information → in the new dialog box click Statistics...

Lab Task

You've been asked to build a software to support a low-cost video editing system. The system accepts videotape as input, stores the video on disk, and then allows the user to do a wide range of edits to the digitized video. The result can then be output to a tape.

Estimated duration 1 month

Staff required:

Project manager \$30/hr.

Emma (senior software engineer) \$20/hr.

Austin (junior developer) \$10/hr.

Harry (junior developer) \$10/hr.

Andrew (junior developer) \$10/hr.

Albert (senior graphic designer/ video editor) \$20/hr.

Frank (junior graphic designer/ video editor) \$10/hr.

Jane (Quality assurance engineer) \$10/hr.

Create complete project plan, build tasks, subtasks, create milestones, mention predecessors, write proper costing and duration. Also show your plan's cost.



Lab 11

Introduction: Get better hands on practice with MS Project

Problem Statement:

- Learn to divide a project proposal into tasks
- Learn to create summary tasks and their subsequent sub tasks.
- Learn how to manage resources
- Learn how to add costing

Online Learning Management System

You are a Project Manager in a renowned software company in Lahore. You have been asked to create an Online Learning Management System. The point of this project is to build up an online app that gives instructors and mentors the capacity to communicate easily with their Students. The project will bring about a framework with **dashboards, courses, attendance, grades, report cards, discussions, participation, tasks(quizzes/assignment/exams)**. The application will likewise permit guardians to remain associated with what their youngsters are doing in the university, to see their advancement, on schedule/late entries and so forth.

The application will have three panels:

- Admin
- Teacher
- Student
- Parent

Duration of this Project is 5 months starting from march 2021 till July 2021.

You have a team of software developers consisting of 2 junior developers lead by a senior developer.

There are 2 in house designers; Ahmad and Ali and a senior QA engineer Rabia.

Ali is on leave from 11th to 18th may.

Create a project plan for the Learning management system. Add task dependencies, milestones, resources and costs for each resource. Setup the calendar where required.



Lab 12

Introduction: Advanced Scheduling with MS Project 2013

Problem Statement:

- Learn about recurring tasks
- Learn how to view critical path
- Total float and free float



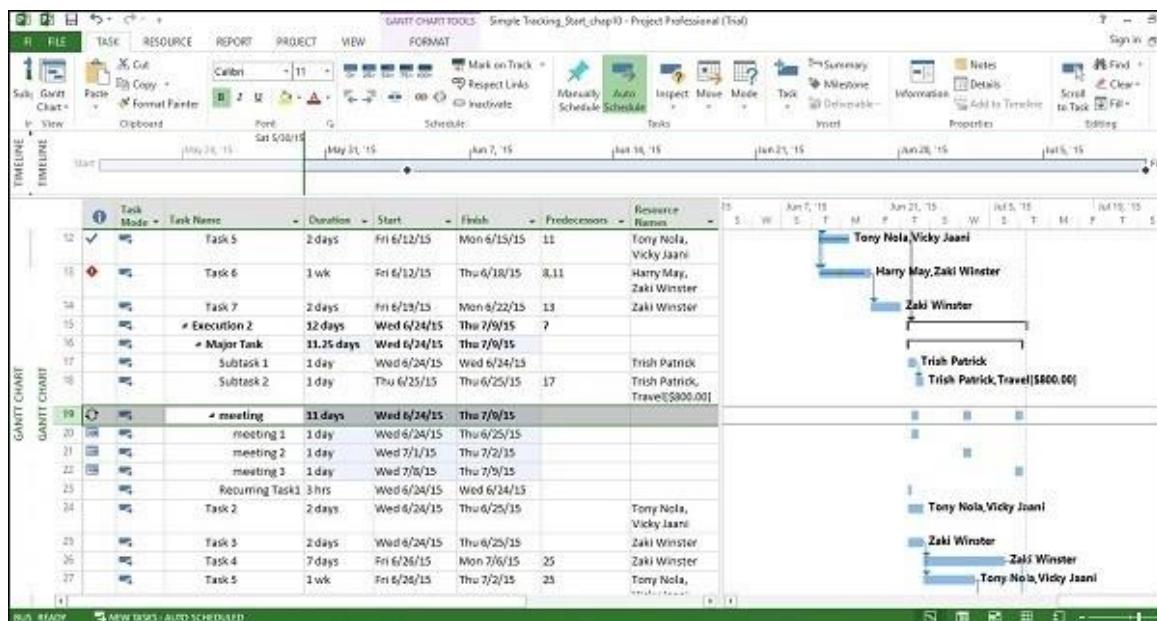
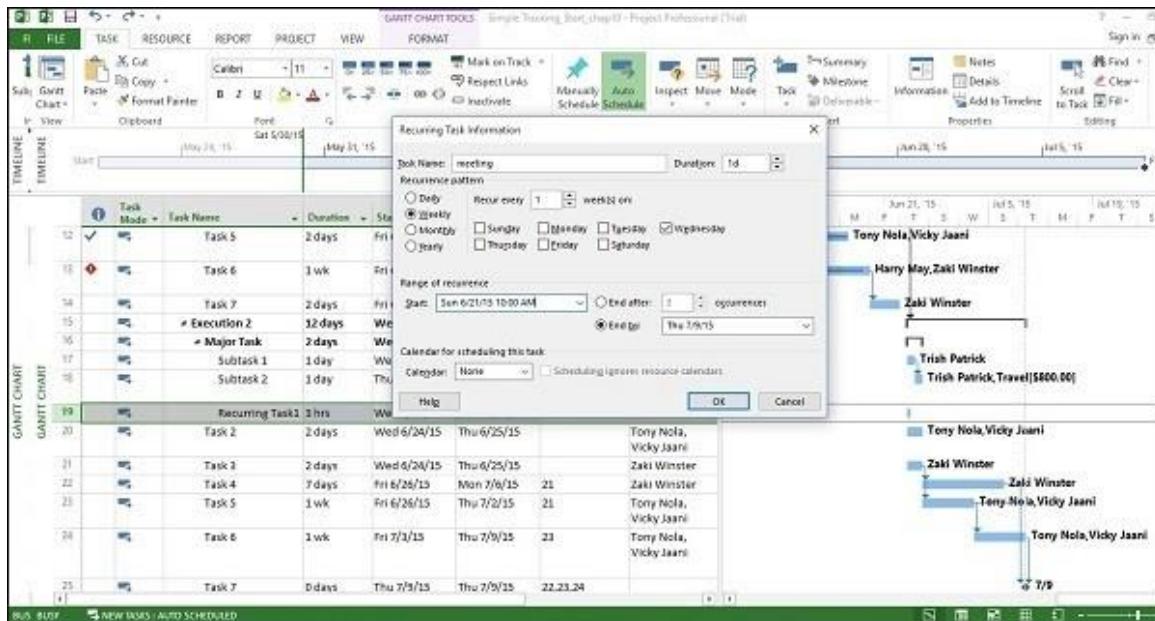
Enter a Recurring Task

Status meetings, status reports, inspection dates can recur with a particular frequency. In MS Project 2013, you can specify recurring tasks without having to assign tasks each time separately. You can also assign resources to these task.

In Gantt Chart View → Task Tab → Insert group → dropdown box for Task → Recurring Task.

Enter Task Name and choose Recurrence pattern.

You can also choose a specific time for the task to start as well. By default Project schedules a recurring task to start on plan's default start time. You can add time value in the Start box for Recurring Task Information dialog box to change this. In the following figure, start time of 10:00 AM is entered.



View Critical Path

Critical Path is the succession of connected tasks that will take the longest to complete. The word "critical" does not mean that the tasks are complex or important or need to be closely monitored, but the focus is on term schedule that will affect the project finish date.

- If you want to shorten the duration of a project, you should first start with activities/tasks on the



critical path.

- Critical path can be a single sequence of tasks (a single critical path) or there can be more than 1 critical paths for a single project.
- While schedule changes are made, it is also likely that the critical path will change from time to time.
- If a task in critical path is late, the project is late.

One needs to always focus on the Critical Path first, when one wants to apply fast-tracking or crashing to shorten the project duration.

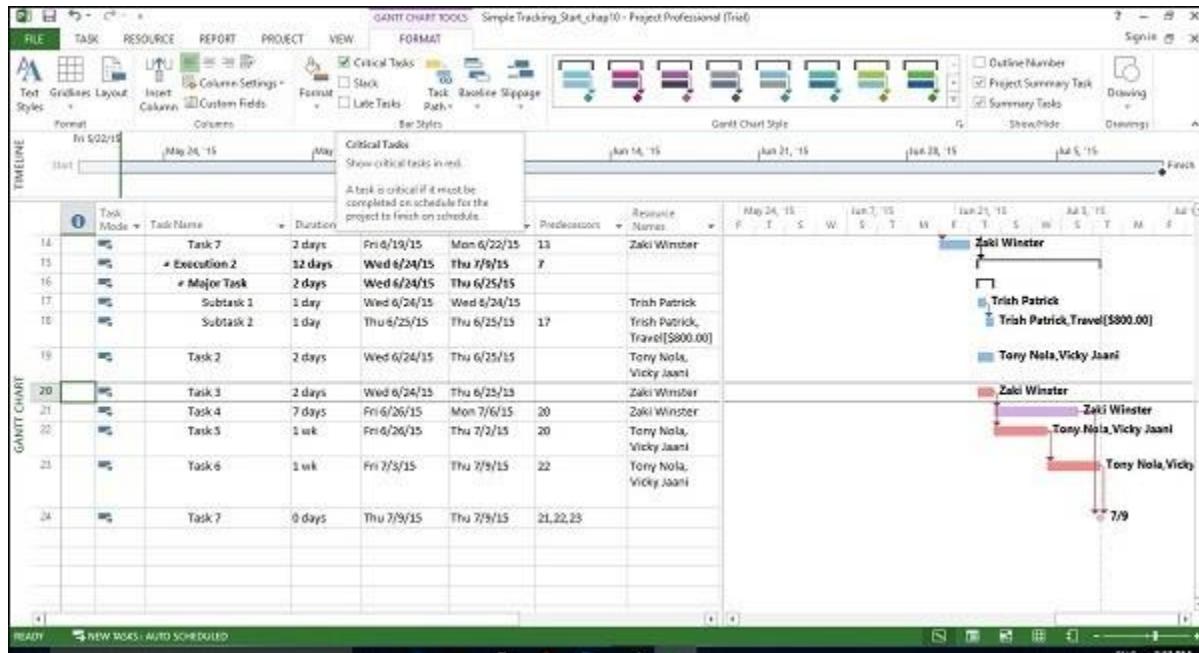
Slack or Float are key to understanding Critical path. There are two types of Float –

- **Free Float** – It is the amount of time a task can be delayed without delaying another task.
- **Total Float** – It is the amount of time a task can be delayed without delaying the completion of the project.

A task is on the critical path if its total float is less than or equal to a certain threshold—by default, if its float is zero days (you can adjust this threshold if you want). In contrast, noncritical tasks have float, meaning that they can start or finish earlier or later within their float time without affecting the completion date of the plan.

All task bars in the critical path, in the Gantt Chart View on the right, will turn Red in color.

In Gantt Chart view → Format Tab → Bar Styles Group → Check the Critical Tasks box ON.



Lab Task

- 1-Create a Recurring task for your FYP project plan.
- 2-Create columns for free slack and total slack. Identify the critical task in you FYP project plan.



Lab 14 & 15

Resource Over Allocation

Introduction: Advanced Scheduling with MS Project 2013

Problem Statement:

- Learn resource allocations
- Resolve resource over allocation



Check Resource Allocations

Relationship between a resource's capacity and task assignments is called allocation.

This can be defined by 3 states –

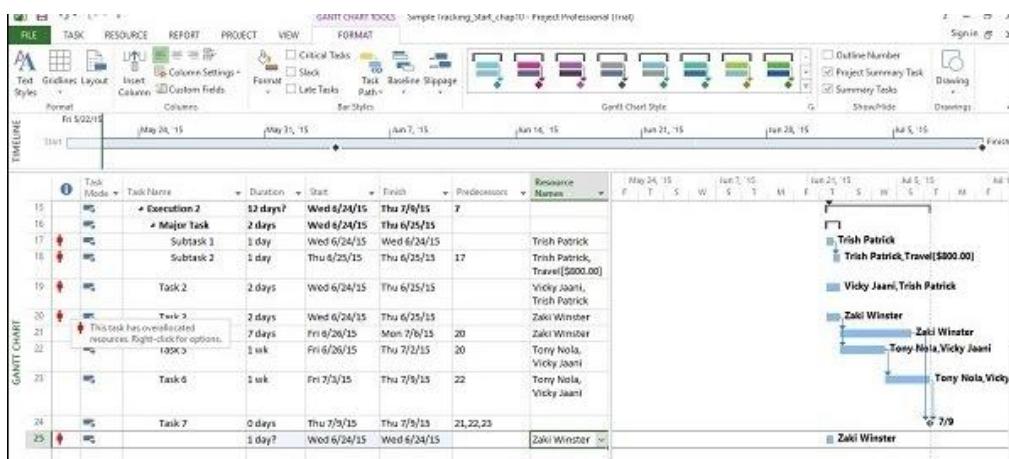
- Under allocated – An Engineer who works for 40 hours a week, has work assigned for only 20 hours.
- Fully allocated – A skilled worker who works for 40 hours a week, is assigned 40 hours of work in that week.
- Over allocated – A carpenter is assigned 65 hours of work, when he only has a 40 hour work week.

In Gantt Chart View

Click View Tab → Task Views group → Gantt Chart view.

Gantt Chart View displays some limited resource information, as shown in the following screenshot.

It summarizes whether there may be a problem by the red over allocated icon in the indicator column.





Click View Tab → Resource Views group → Resource Usage view.

The Resource Usage view displays resources and all tasks assigned to them underneath the ResourceName. The left-hand side of the screen lists the Resources and the TaskNames together with columns of total information for the resource or assignment. The right-hand side shows a time-phased view.

Resource Name	Work	Timeline											
		May 24, '15	May 31, '15	Jun 7, '15	Jun 14, '15	Jun 21, '15	Jun 28, '15	Jul 5, '15	May 24, '15	May 31, '15	Jun 7, '15	Jun 14, '15	Jun 21, '15
Trish Patrick	8hrs	Work							8h	8h			
Task 2	8hrs												
Task 5	16 hrs	Work											
Task 5	40 hrs	Work											
Task 6	40 hrs	Work											
Vicki Joani	122 hrs	Work											
Task 5	16 hrs	Work											
Task 2	16 hrs	Work											
Task 5	40 hrs	Work											
Task 6	40 hrs	Work											
Will Farmer	0 hrs	Work											
Zaki Waseem	256 hrs	Work											
Task 4	80 hrs	Work											
Task 4	40 hrs	Work											

You can also collapse the outline in the table to see total work per resource overtime.

Click on Resource Name column heading.

Click View Tab → Data group → Outline → Hide Subtasks.

Resource Name	Work	Timeline												
		'15	W	M	May 24, '15	T	F	S	Jun 7, '15	T	F	S	Jul 5, '15	T
Printing	0 hrs	Work												
Rocky Waron	0 hrs	Work												
Shazia Sherreen	4 hrs	Work												
Tony Nola	184 hrs	Work												
Trish Patrick	72 hrs	Work												
Travel		Work												
Vicky Joani	132 hrs	Work												
Vicky Joani	Overalloc.	Work												
Vicky Joani	Overalloc.	Work												
Vicky Joani	Overalloc.	Work												
Vicky Joani	Overalloc.	Work												
Vicky Joani	Overalloc.	Work												



Resolve Resource Over Allocation

One would need to either change the scope (reduce the amount of work), assign more resources, or accept a longer schedule to resolve over allocation.

This can be achieved by using some of the following techniques –

Adjust Schedule

By changing its lead or lag time when the resource has more tasks assigned than can be completed during a given time period. If you add delay that is less than or equal to the amount of slack on the task, you will not affect the finish date of the project.

By default when you link tasks, they are assigned a “Finish to Start” relationship. In this relationship,

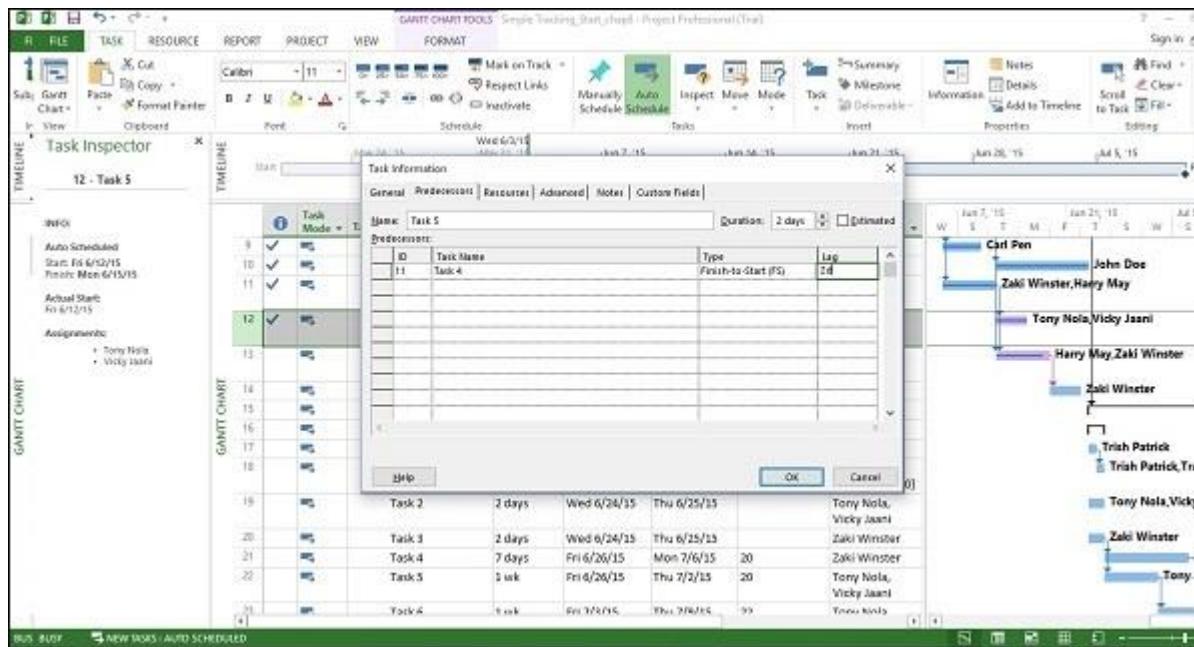
- **Lead** – Lead time causes successor task to begin before its predecessor tasks ends.
- **Lag** – Lag time causes successor task to start after its predecessor task ends.

Click Task Tab → double-click the required Task under Task Name column → Task Information dialog box opens → Predecessors Tab.

Under Lag heading column, enter the lag in terms of hours, days, weeks, or years.

You can also apply lag or lead as a percentage. If you enter 50% for the selected Task which is 6 days long, the task is delayed by 3 days after the predecessor ends.

Lag is entered as positive units and lead in negative units (example, -3d or -50%).





Substitute Resources or Add Additional Resources

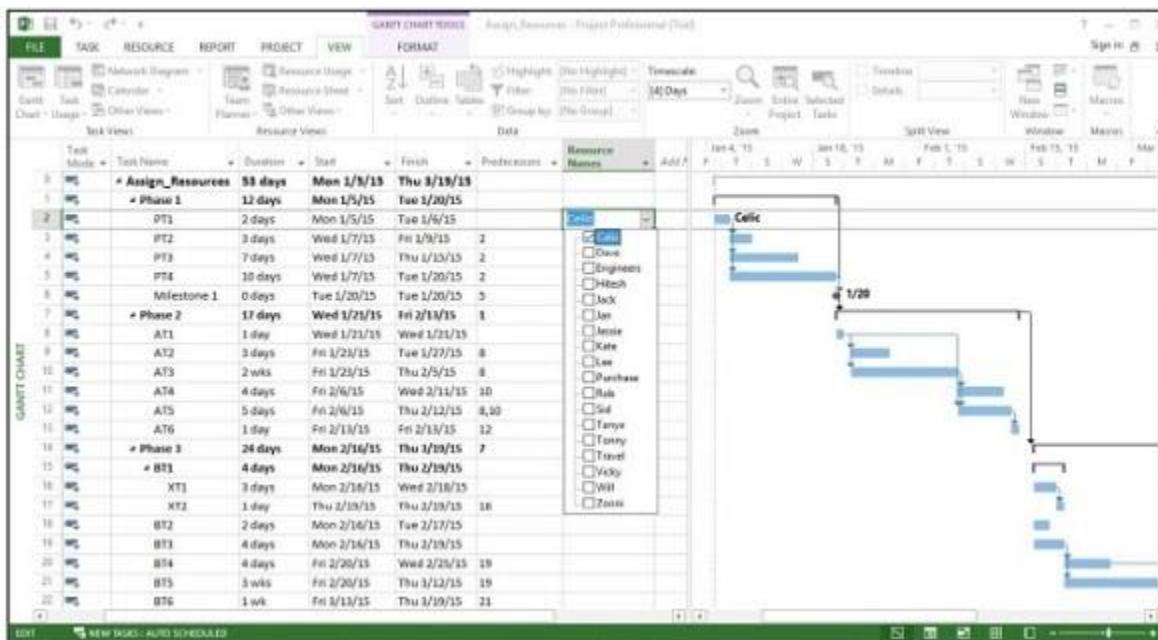
You can manually allot some other resource to the task.

Click View Tab → Gantt Chart View → Resource Name column.

Click the box below the Resource Name column for the task you need the resource to be assigned.

From the dropdown, choose the resource name. In the following example, for Task 1 "PT1", we have chosen the resource "Celic".

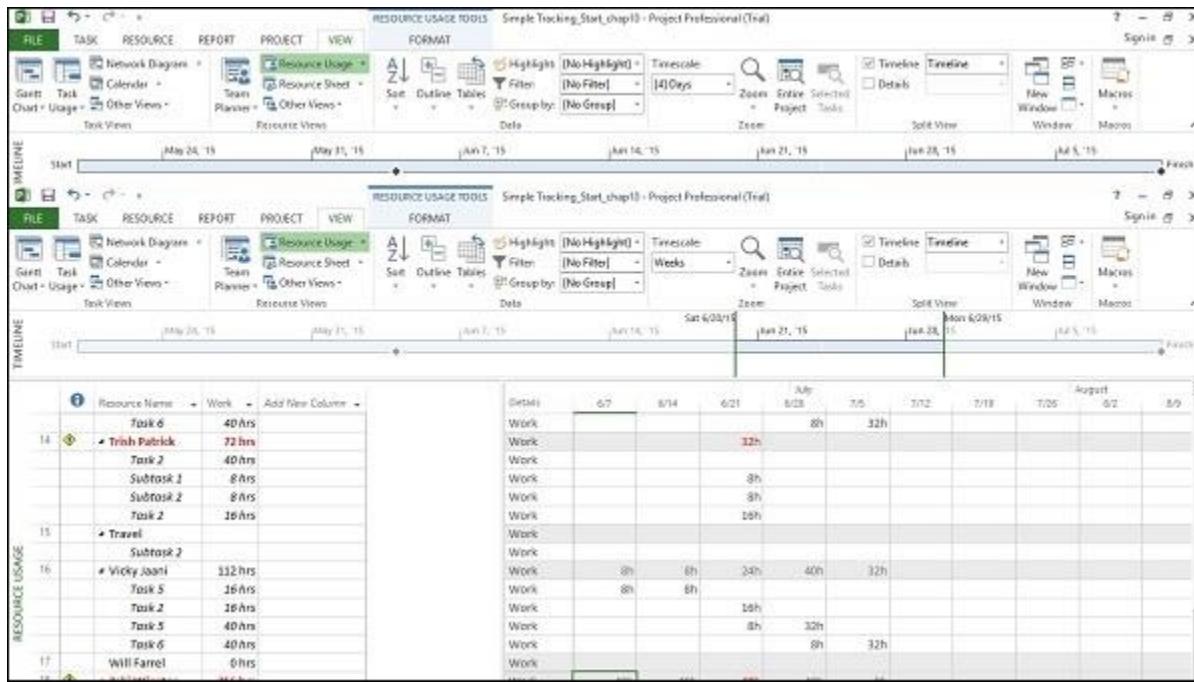
You can also select multiple resources to work on a single task.



Reduce Assigned Work

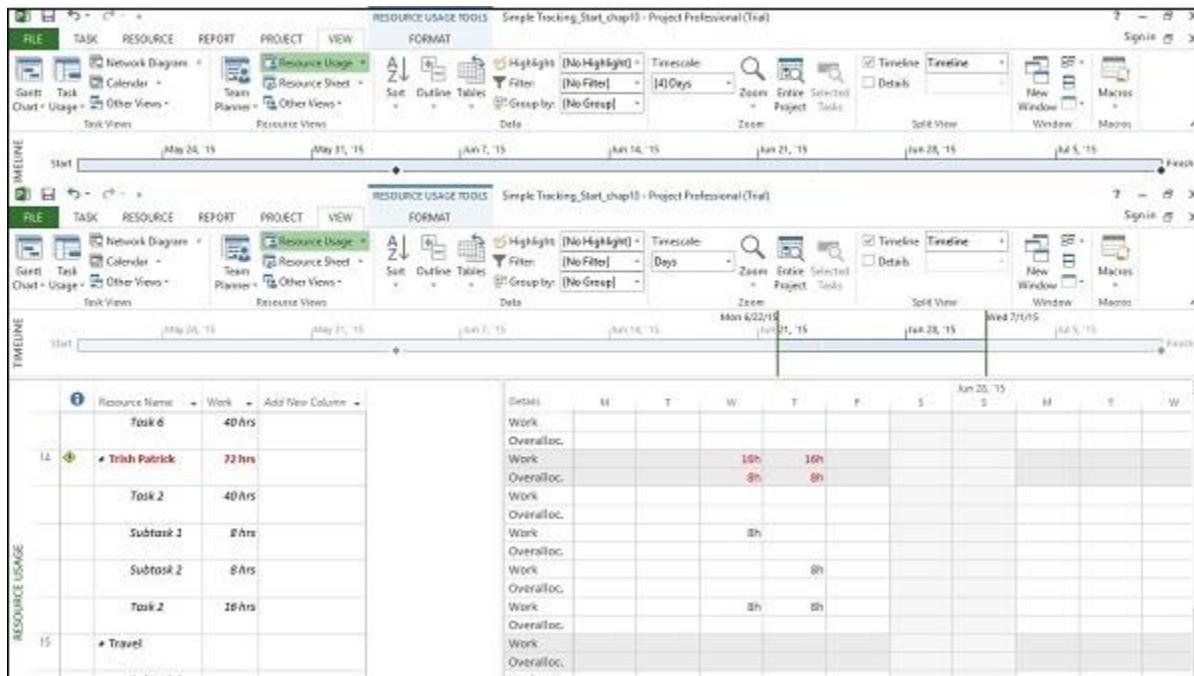
Click View Tab → Resource Views group → Resource Usage view.

In the following example, Trish Patrick is over allocated, the Resource Name and Work appear in red.



On View tab → Zoom group → Timescale box → Days.

You can also right-click on the Time-phased grid in the right hand side window to display amount of overallocation by switching on overallocation.



Now you can reduce the assigned hours. In the following example, 8-hour assignment is reduced to 4-hour assignments. Not only is Trish Patrick's work reduced but total work in the plan has changed. You will also notice a new icon in the indicator column to let you know that the assignment work has been edited.



The screenshot displays two side-by-side Microsoft Project windows. Both windows show the 'Resource Usage' view for a project named 'Simple Tracking_Start_chap10'. The top window is titled 'Simple Tracking_Start_chap10 - Project Professional (Trial)' and shows a timeline from May 24, '15 to July 8, '15. The bottom window is also titled 'Simple Tracking_Start_chap10 - Project Professional (Trial)' and shows a timeline from June 2, '15 to July 10, '15. Both windows have similar toolbars and ribbon menus. The resource usage grid lists tasks and their assigned resources. In the bottom window, a resource named 'Trish Patrick' is assigned to Task 1, which has a duration of 40 hrs. The resource usage table shows multiple entries for this task, indicating overallocation.

Resource Name	Task	Work
Trish Patrick	Task 1	56 hrs
	Task 2	40 hrs
	Subtask 1	4 hrs
	Subtask 2	4 hrs
	Task 2	8 hrs
	* Travel	

Detail	M	T	W	T	F	S	Jun 20, '15	S	M	T	W
Work											
OverallAlloc.											
Work				8h	8h						
OverallAlloc.											
Work											
OverallAlloc.											
Work											
OverallAlloc.											
Work											
OverallAlloc.											
Work											
OverallAlloc.											
Work											

Decrease Task Duration

You can decrease task duration (if no actual work has been entered) to reduce the amount of work required of the resource, who is assigned to complete the task. If actual work has been recorded, you must manually reduce the remaining work on the task.

Remove Over Allocated Resource

You can just remove a resource assignment from an overallocated resource.



Lab 16 & 17

Task Constraints

Introduction: Advanced Scheduling with MS Project 2013

Problem Statement:

- What is meant by task constraints
- Apply different tasks constraints and what is meant by each



Lead and Lag

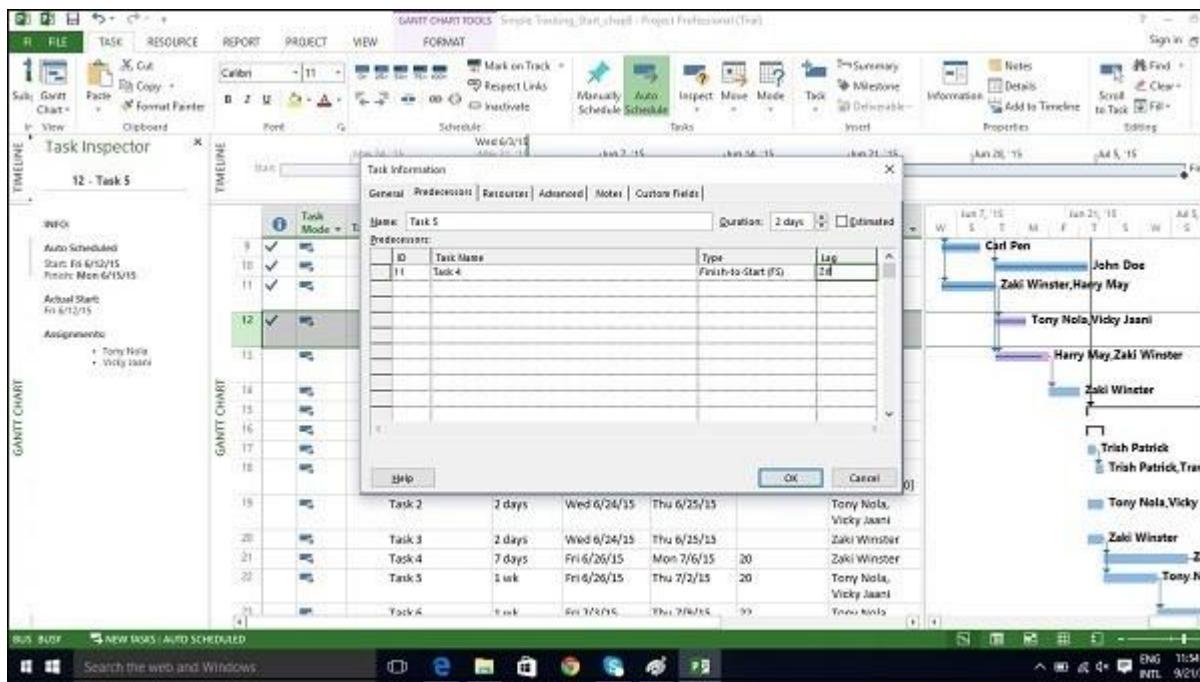
By default when you link tasks they are assigned a “Finish to Start” relationship. In this relationship,

- Lead – Lead time causes successor task to begin before its predecessor task ends.
- Lag – Lag time causes successor task to start after its predecessor task ends.

Click Task Tab → double-click the required Task under Task Name column → Task Information dialog box opens → Predecessors Tab.

Under Lag heading column, enter the lag in terms of hours, days, weeks, or years. You can also apply lag or lead as a percentage. If you enter 50% for the selected Task which is 6 days long, the task is delayed by 3 days after the predecessor ends.

Lag is entered as positive units and lead in negative units (example, -3d or -50%).



Apply Task Constraints

- In MS Project 2013 by default each task is constrained as “As Soon As Possible” when Automatic Scheduling is turned ON.
- As Soon As Possible means the task starts as soon as the project starts, if there are no dependencies that would delay it.
- No fixed start or end dates are imposed by this constraint type, but of course predecessor and successor dependencies are maintained.

When MS Project 2013 performs calculations to save you time in a project that's running late, constraint settings are enforced.

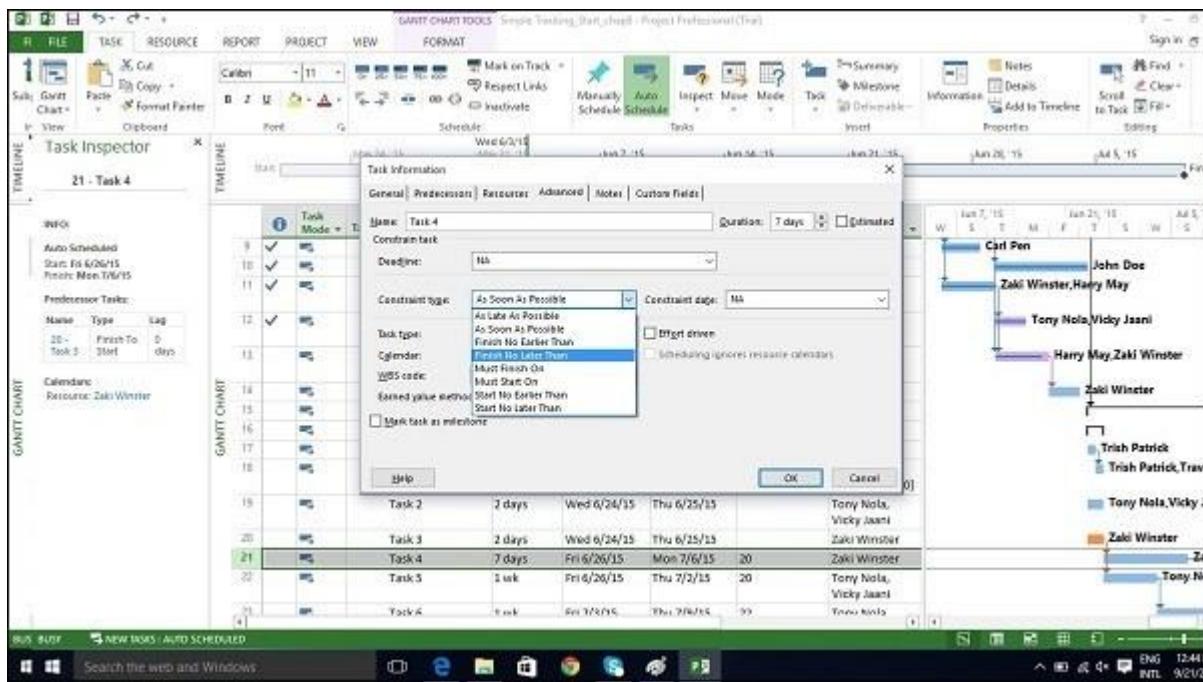
There are 8 Task Constraints.



Constraint type	Constraint name	Description
Flexible	As Late As Possible (ALAP)	Task is scheduled as late as possible with the task ending before the project ends and without delaying subsequent tasks. Default constraint when you schedule from the project finish date. Do not enter a task start or finish date with this constraint.
	As Soon As Possible (ASAP)	Task is scheduled to begin as early as possible. Default constraint when you schedule from the project start date. Do not enter a start or finish date with this constraint.
Semi-Flexible	Start No Earlier Than (SNET)	Task is scheduled to start on or after a specified date.
	Finish No Earlier Than (FNET)	Task is scheduled to finish on or after a specified date.
	Start No Later Than (SNLT)	Task is scheduled to start on or before a specified date.
	Finish No Later Than (FNLT)	Task is scheduled to finish on or before a specified date.
Inflexible	Must Finish On (MFO)	Task is scheduled to finish on a specified date.
	Must Start On (MSO)	Task is scheduled to start on a specified date.

Click Task Tab → double-click the required Task under Task Name column → Task Information dialog box opens → Advanced Tab.

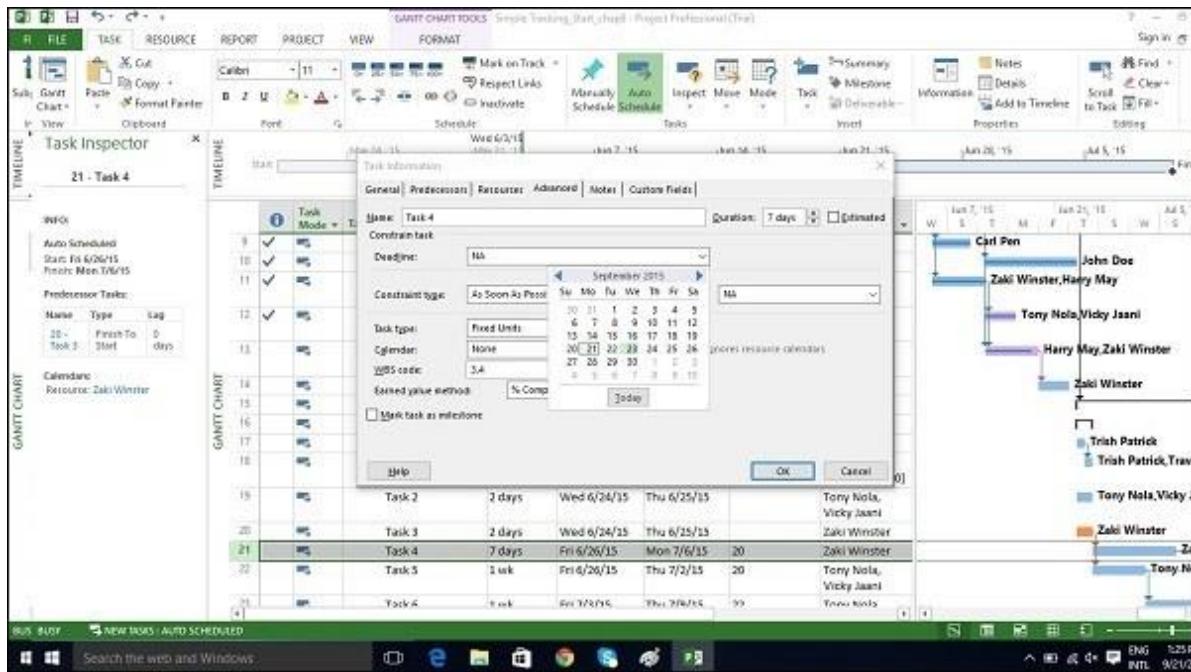
Click dropdown box for Constraint type. Choose the constraint you would like to apply



Enter Deadline Date

If you use Tasks Constraints, you limit your scheduling flexibility, where MS Project 2013 will fix a particular start or finish date of the task according to the constraint. It is a better idea to use a Deadline Date which has no effect on the scheduling of a task or summary task. MS Project will alert you with a red exclamation symbol in the indicators column, if the scheduled completion of the task exceeds its deadline date.

Click Task Tab → double-click the required Task under Task Name column → Task Information dialog box opens → Advanced Tab.



Lab Task 15

- Create additional columns for “free slack, total slack, Early start, Early finish, late start and late finish” for your FYP Task list
- Create critical path
- Apply all 8 task constraints to your FYP task list



Lab 18

Resource Over Allocation

Introduction: Advanced Scheduling with MS Project 2013

Problem Statement:

- Learn resource allocations
- Resolve resource over allocation

Lab Task

Open the “Lab 16 practice task.mpp” file and check the resource allocations. See if there is any resource over allocations. Apply the steps learnt in lab 14 to resolve resource over allocation.



Lab 19& 18

Levelling

Introduction: Level Over Allocated Resources

Problem Statement:

- Learn what is meant by leveling
- Learn to set priorities
- Learn to level over allocated resource
- Check plan's cost



Level Over Allocated Resources

If resources are over allocated you can use resource-leveling feature in MS Project 2013. It works by either splitting tasks or by adding delay to tasks to ensure the resource is not overloaded. Leveling can delay the individual task finish dates and even the project finish date.

Project first delays tasks to use up any available slack. Once the slack becomes zero, MS Project 2013 makes changes according to priorities, dependency relationships and task constraints (such as a Finish No Later Than constraint).

Set Priorities

It is always better to set task priorities (this is a measure of a task's importance/availability for leveling). You can enter value between 1 and 1000, according to the amount of control you like in the leveling process. A priority level of 1000 will ensure MS Project does not level a particular task. By default, priority is set at 500 or a medium level of control. Tasks that have lower priority are delayed or split before those that have higher priority.



Click View Tab → Task Views → Gantt chart View.

In the Gantt chart table area, scroll to the right to see Add New Column.

Click on the dropdown box and select Priority.

The screenshot shows two Microsoft Project windows side-by-side. Both windows have the title bar "RESOURCE USAGE TOOLS: Simple Tracking_Start_chap10 - Project Professional (Trial)". The left window is in "Task Views" mode, and the right window is in "Gantt Chart Tools" mode. In the right window, the "Add New Column" dropdown menu is open, showing options like "Priority". A tooltip indicates that typing into the column will automatically create a new column. The Gantt chart displays tasks from May 24 to July 5, 2015, with various resources assigned to each task.

Now you can add priority to each task as required.

The screenshot shows the Microsoft Project interface after adding the "Priority" column. The "GANTT CHART" tab is selected. The table now includes a "Priority" column. The Gantt chart displays tasks from May 24 to August 2, 2015, with resource assignments and priority levels. The "Priority" column contains values such as 1, 2, 3, 4, 5, etc., indicating the relative importance of each task.



Levelling

Steps in the Leveling process are only a few, but it is important to understand what each option does. The steps are as follows –

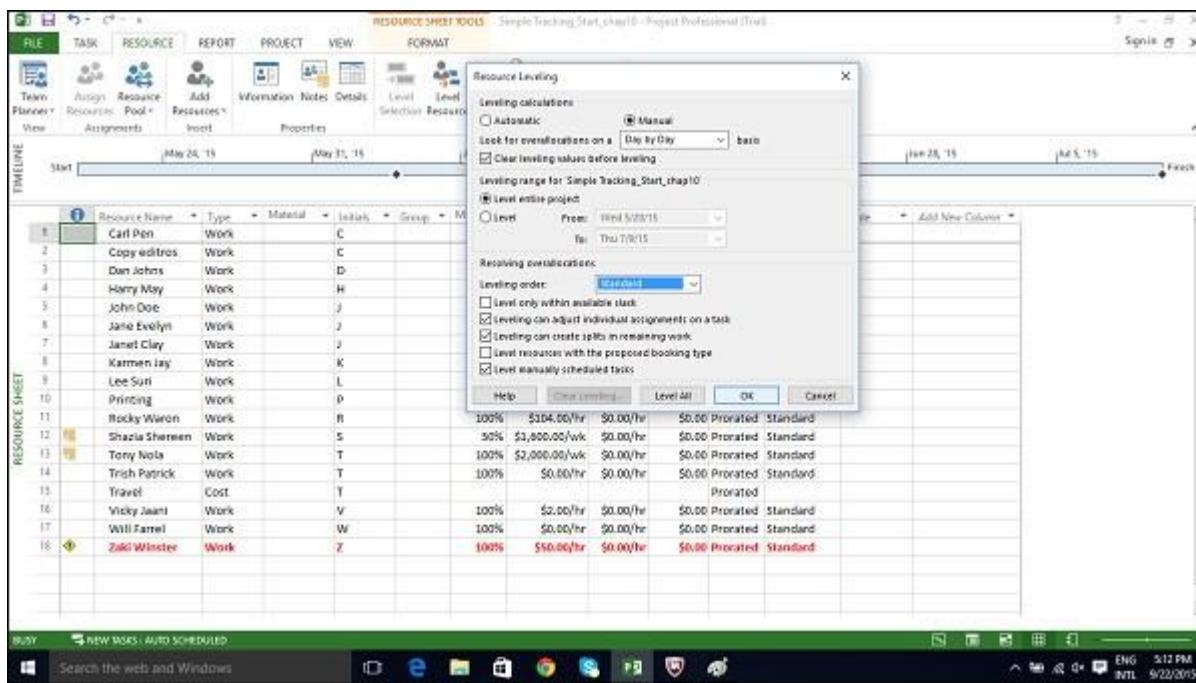
Click on View Tab → Resource View group → Resource Sheet.

Click Resource tab → Level group → Leveling Options → Level All.

Project does leveling and over allocated indicators are removed (If leveling is done completely, sometimes this might not happen).

In the following section, we will look at Leveling Options in detail –

Click Resource tab → Level group → Leveling Options.





Step 1: In Resource Leveling dialog box, under Level calculations, try to use Manual more often. This will ensure MS Project 2013 does the leveling process only when you ask it to, and not as soon as a resource becomes over allocated even if you don't want it to (when you choose Automatic option). For examples, if a resource is over allocated, for say half an hour more in a week, from 40 hours to

40.5 hours, you wouldn't want this to inconvenience you by getting automatically leveled.

Step 2: In Resource Leveling dialog box, under Level calculations, choose Day by Day basis for "Look for over allocations on a" option. Doing so will not level resources, but it will determine when Project displays over allocation indicators next to resourcenames.

Step 3: In Resource Leveling dialog box, under Level calculations, use the clear leveling values before leveling checkbox is selected. Doing so will ensure Project removes any existing leveling delays from all tasks and assignments before leveling. And if you previously leveled the plan and then added more assignments, you might want checkbox to be unchecked to ensure you don't lose the previous leveling results.

Step 4: In Resource Leveling dialog box, under **Leveling range for "....."**, you can choose **Level entire project**. Here you choose to level either the entire plan or only assignments that fall within a date range you specify.

Step5: In Resource Leveling dialog box, under Resolving over allocations, **leveling order** dropdown box you can choose Standard. You have 3 options here –

- **ID only** option delays tasks only according to their ID numbers. *Numerically higher ID numbers (for example, 10) will be delayed before numerically lower ID numbers. You might want to use this option when your plan has no task relationships or constraints.*
- **Standard option** delays tasks according to *predecessor relationships, start dates, task constraints, slack, priority, and IDs.*
- **Priority, standard option** looks at the task priority value before the other standard criteria (Task priority is a numeric ranking between 0 and 1000).

Step6: In Resource Leveling dialog box, under Resolving over allocations, you have several options that you can select. These are explained as follows –

- **Level only within available slack.** Selecting this checkbox would prevent Project from extending the plan's finish date. MS Project will use only the free slack within the existing schedule, which could mean that resource over allocations might not be fully resolved.
- **Leveling can adjust individual assignments.** Selecting this checkbox allows Project to add a leveling delay (or split work on assignments if Leveling Can Create Splits in Remaining Work is also selected) independently of any other resources assigned to the same task. This might cause resources to start and finish work on a task at different times.
- **Leveling can create splits in remaining work checkbox.** This allows Project to split work on a task (or on an assignment if Leveling Can Adjust Individual Assignments on a Task is also selected) as a way of resolving over allocation.



- **Level manually scheduled tasks.** Selecting this allows Project to level a manually scheduled task just as it would an automatically scheduled task

Lab 20 & 22

Introduction: Learn how to track progress by saving baselines

Problem Statement:

- Learn what is a baseline
- Learn how to set a baseline-table
- Learn how to set a baseline
- Learn what is interim plan



MS Project - Track Progress

Once your project plan is ready in MS Project, it becomes essential for a project manager to measure the actuals (in terms of work completed, resources used and costs incurred) and to revise and change information about tasks and resources due to any changes to the plans.

Save a Baseline

To evaluate project performance, you need to create a baseline against which you will compare the progress. One needs to save the baseline, once a plan is fully developed. Of course, one can always add new tasks, resources, constraints and costs to the plan.

Also note, it makes sense to save the baseline before entering any actual values such as percentage of task completion.

Note – With MS Project 2013, you can save up to 11 Baselines in a Single plan. These multiple baselines seem contrary to the definition of baseline. You can use this flexibility when –

- You have a baseline plan for the external customer and another for the internal team.
- You are preparing for a risk event. You want to develop separate baseline plans for risk response and recovery.
- You are accommodating a big change request; you might still want to keep the original plan for future reference when communicating with a stakeholder.

Create a Baseline table

Click View → table → more tables → baseline→ OK.

Note: Now all the table entries are zero as no baseline is set yet.



Create a Baseline

Click Project Tab → Schedule group → Set Baseline → OK.

The screenshot shows the Microsoft Project Professional interface. The ribbon tabs are visible at the top, with 'PROJECT' selected. In the center, there's a 'Resource Overview' chart. On the right, a 'Gantt Chart Tools' tab is active, showing a timeline from May 24, 2015, to July 10, 2015. A 'Set Baseline' dialog box is open over the Gantt chart. The dialog has several options: 'Baseline' (radio button selected), 'From' (set to 'Scheduled Start/Finish'), 'For' (radio button selected, 'Entire project'), and 'OK' and 'Cancel' buttons. The background Gantt chart displays tasks like 'Simple Tracking_Start_chap1', 'Planning Phase', and 'Execution' with their respective start and end dates.

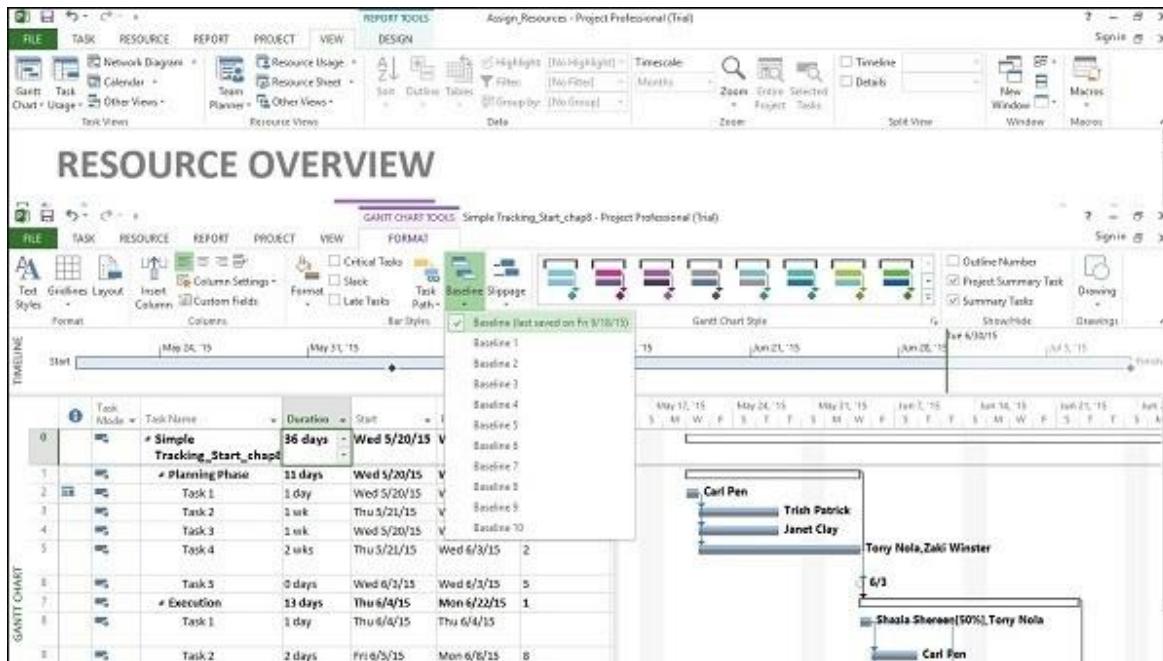


View Baseline on Gantt Chart

Click View Tab → Task Views group → Gantt Chart.

Click Format Tab → Bars and Styles group → Baseline (that you want to display).

You will see Baseline Gantt bars displayed together with the current Gantt bars.



Update a Baseline

As time and work progresses on a project, you might need to change the baseline as well. You have several options for the same –

- Update the baseline.
- Update the baseline for selected tasks. Save
- multiple baselines.



Update the Baseline for the Entire Project

This simply replaces the original baseline values with the currently scheduled values.

Click Project Tab → Schedule group → Set Baseline → OK.

Update the Baseline for Selected Tasks

This does not affect the baseline values for other tasks or resource baseline values in the plan.

Click Project Tab → Schedule group → Set Baseline → For select Selected tasks → OK.

Save Multiple Baselines

You can save up to 11 baselines in a single plan. The first one is called Baseline, and the rest are Baseline 1 through Baseline 10.

Click Project Tab → Schedule group → Set Baseline → click the dropdown box to save any baseline you like.

Click OK.

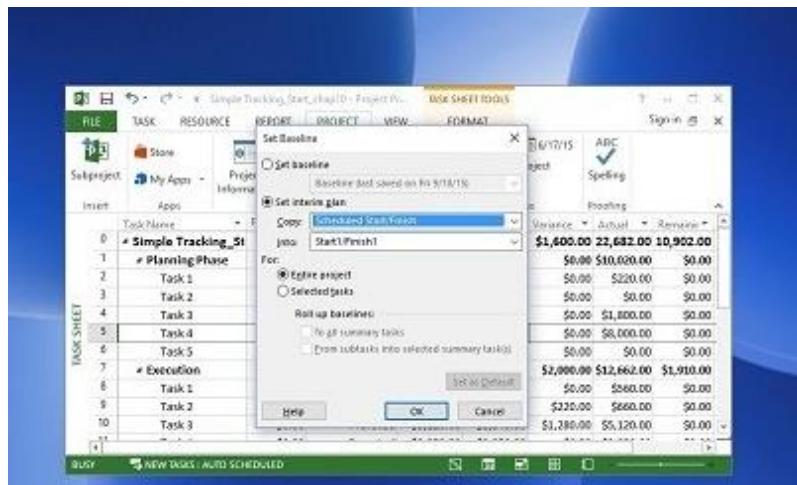
The screenshot shows a Microsoft Project Professional window with a task list. A 'Set Baseline' dialog box is open over the task list. The dialog has a dropdown menu where 'Baseline (first saved on Fri 9/18/15)' is selected. Other options in the menu include 'Baseline 1', 'Baseline 2', 'Baseline 3', 'Baseline 4', 'Baseline 5', 'Baseline 6', 'Baseline 7', 'Baseline 8', 'Baseline 9', and 'Baseline 10'. The 'OK' button is visible at the bottom right of the dialog.



Interim Plans

An interim plan saves only two kinds of information for each task – Current start dates and Current finish dates. It can be used as a project marker. It is visually easy to see how off-track or on-track the project progress is. Because it only specifies dates, it is simple, clear and easy information.

Click Project Tab → Schedule group → Set Baseline → Set interim plan → OK.



Lab task

Save a base line for your FYP project plan. After doing changes in durations save another baseline and explore the differences.



Lab 23 & 24

Task Slippage

Introduction: Advanced Scheduling with MS Project 2013

Problem Statement:

- Learn what is task slippage
- How to view tasks with variance?



After creating a project plan and baselines, the project begins. At this stage, the project manager would be focusing on collecting, monitoring, analyzing project performance, and updating project status by communicating with the stakeholders.

When there is a difference between what is planned and the actual project performance, it is called a **Variance**. Variance is mostly measured in terms of Time and Cost.

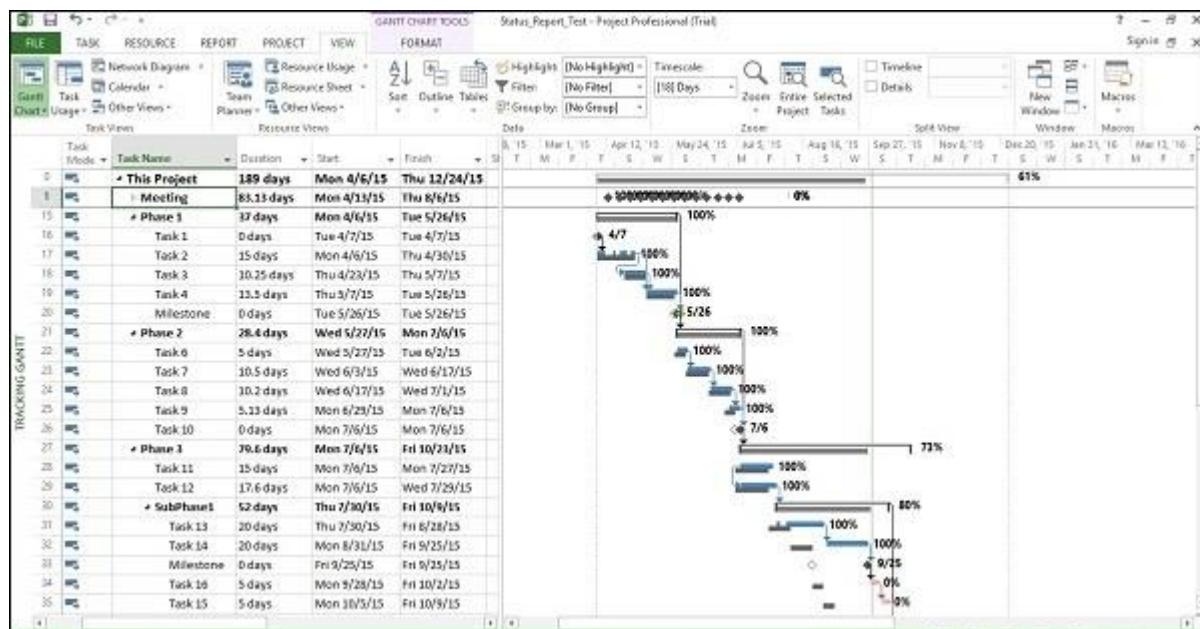
Task Slippage

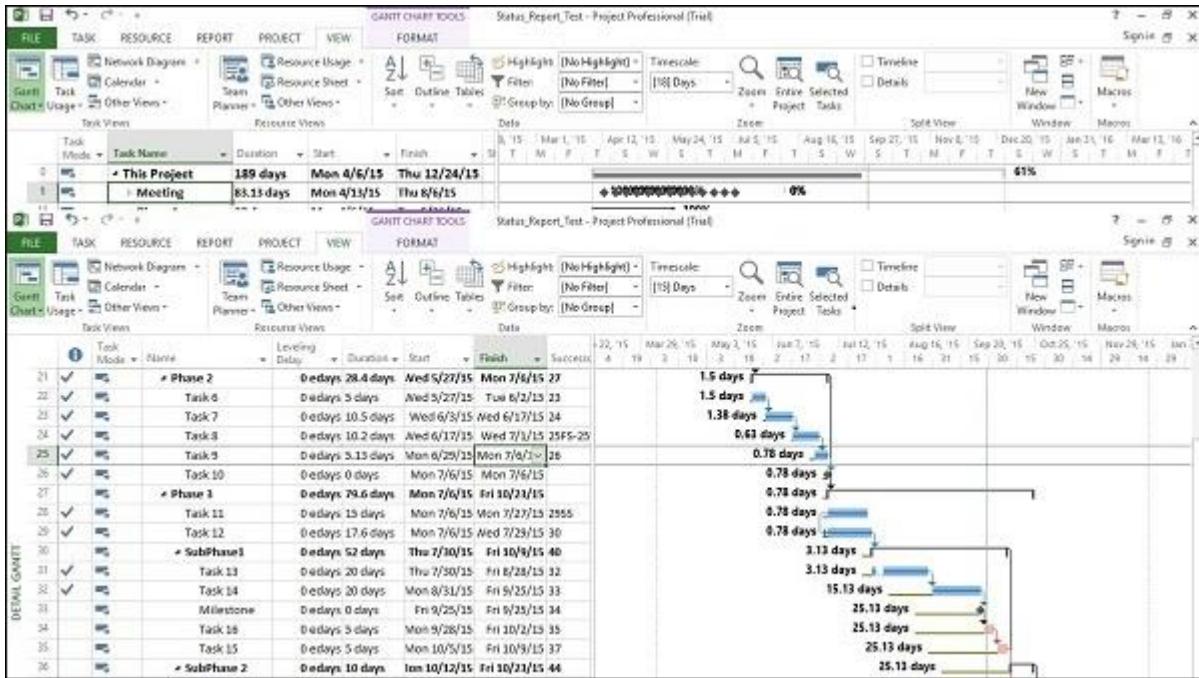
There are several ways to view task with variance.

Method 1: Graphical View by Tracking Gantt

Click View tab → Task Views group → Gantt Chart dropdown → Tracking Gantt.

By comparing the currently scheduled Gantt bars with baseline Gantt bars, you can see what tasks started later than planned or took longer to complete.





Method 3: Variance Table

Click View tab → Data group → Tables → Variance.

Method 4: Filters

Click View tab → Data group → Filters → More
Filters → choose filter as Late tasks, Slipping task, etc.

MS Project 2013 will filter the task list to show only the tasks filtered in this process. So if you select Slipping Task, you will view only incomplete tasks. Any task that is already completed will not show up.

Lab Task

Open gantt of .mpp file. Explore how changes effect the slippage of the successor





Lab 25

Introduction: Advanced Scheduling with MS Project 2013

Problem Statement:

- Learn about task costs
- Learn about resource costs
- Learn about project reports

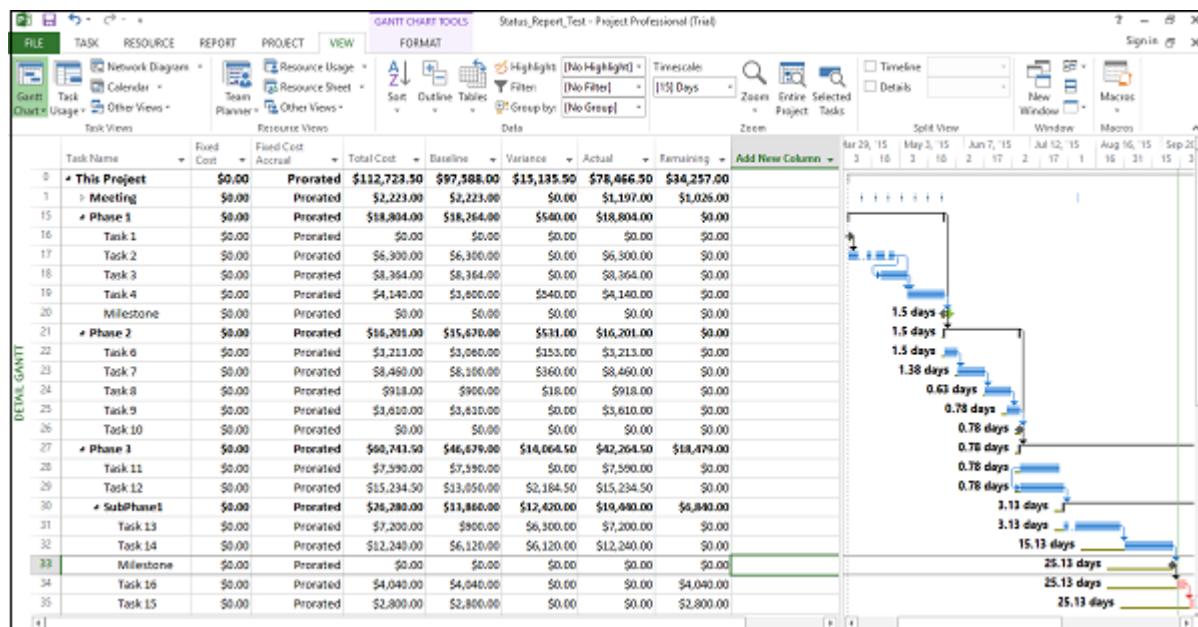


Task Costs

To examine cost in a project life cycle, you should be aware of these terms and what they mean in MS Project 2013 –

- **Baseline costs** – All planned costs as saved in baseline plan.
- **Actual costs** – Costs that have been incurred for tasks, resources, or assignments.
- **Remaining costs** – Difference between baseline/current costs and actual costs.
- **Current costs** – When plans are changed due to assigning or removing resources, or adding or subtracting tasks, MS Project 2013 will recalculate all costs. This will appear under the fields labeled Cost or Total Cost. If you have started to track actual cost, it will include actual cost+ remaining cost (uncompleted task) per task.
- **Variance** – Difference between Baseline Cost and the Total Cost (current or scheduled cost).

Click View Tab → Data group → Tables → Cost.



You will be able to view all relevant information. You can also use filters to see tasks that have run over budget.

Click View tab → Data group → Filters → More Filters → Cost Overbudget → Apply.



Resource Cost

For some organizations, resources costs are primary costs, and sometimes the only cost, so these need to be closely watched.

Click View tab → Resource Views group → Resource Sheet.

Click View tab → Data group → Tables → Cost.

We can sort the Cost column to see which resources are the most and least costly.

Click the AutoFilter arrow in Cost column heading, when the drop-down menu appears, click on Sort Largest to Smallest.

You can use the AutoFilter feature for each of the columns, By sorting Variance column, you will be able to see the variance pattern.

Resource Name	Cost	Baseline	Variance	Actual Cost	Remaining	Add New Column
3 Engineer	\$20,718.00	\$13,500.00	\$7,218.00	\$20,718.00	\$0.00	
5 Hero Marcus	\$25,432.25	\$22,066.25	\$3,366.00	\$18,654.75	\$8,777.50	
4 Danny Jansen	\$11,740.25	\$8,644.75	\$3,095.50	\$9,399.75	\$2,340.50	
8 Lo Santiago	\$15,456.00	\$14,000.00	\$1,456.00	\$9,854.00	\$5,600.00	
1 Carl Pen	\$11,182.50	\$11,182.50	\$0.00	\$8,767.50	\$2,415.00	
2 Services	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
6 Johnny Danner	\$18,848.50	\$18,848.50	\$0.00	\$11,778.50	\$6,072.00	
7 Jackie Chan	\$546.00	\$546.00	\$0.00	\$234.00	\$252.00	
9 Technical Writer	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
10 Trump Olson	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
11 Travel	\$3,500.00	\$3,500.00	\$0.00	\$0.00	\$3,500.00	
12 Miscellaneous	\$300.00	\$300.00	\$0.00	\$0.00	\$300.00	

Project Report

Project 2013 comes with a set of predefined reports and dashboards. You'll find all of these on the Report tab. You can create and customize graphical reports for your project as well.

Dashboard Reports

Click Report → View Reports group → Dashboards.

Resource Reports

Click Report → View Reports group → Resources.



Cost Reports

Click Report → View Reports group → Costs.

Progress Reports

Click Report → View Reports group → In Progress.

Custom Reports

Click Report → View Reports group → New Report.

There are four options.

- **Blank** – Creates a blank canvas. Use the Report Tools - Design tab to add charts, tables, text, and images.
- **Chart** – Creates a chart comparing Actual Work, Remaining Work, and Work by default. Use the Field List pane to pick different fields to compare. The look of the chart can be changed by clicking on Chart Tools tabs, Design, and Layout tabs.
- **Table** – Creates a table. Use the Field List pane to choose what fields to display in the table (Name, Start, Finish, and % Complete appear by default). Outline level box lets you select how many levels in the project outline the table should show. The look of the table can be changed by clicking on Table Tools tabs, Design, and Layout tabs.
- **Comparison** – Creates two charts side-by-side. Charts will have the same data at first. You can click one of the charts and pick the data you want in the Field List pane to begin differentiating them.



Lab 26 & 27

Network Diagram

Introduction: Advanced Scheduling with MS Project 2013

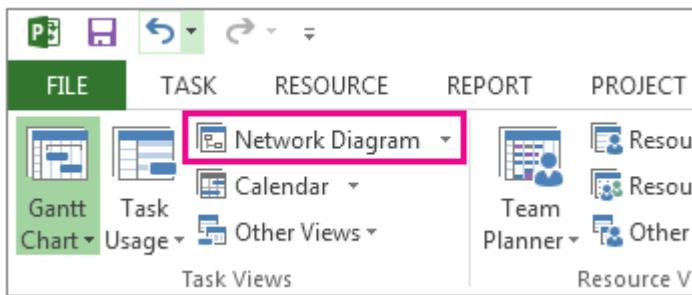
Problem Statement:

- Creating Network diagram from the scratch
- How to represent non critical tasks, critical tasks, summary tasks, milestones.
- How to add predecessor, resources, indentations



Network Diagram

To find the Network diagram view, choose **View > Network Diagram**.



Add a legend

Choose **File > Print > Page Setup**.

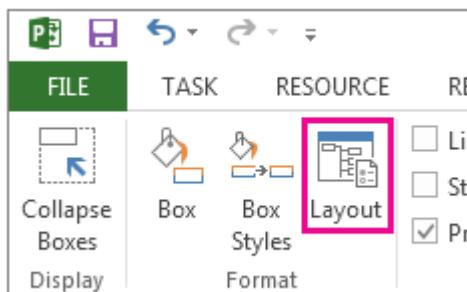
On the Legend tab, decide how you want your legend to look, which pages it should show up on, and then labels you want.

Choose OK.

Automatically change the way the boxes are laid out

Choose **View > Network Diagram**.

Choose **Format > Layout**.



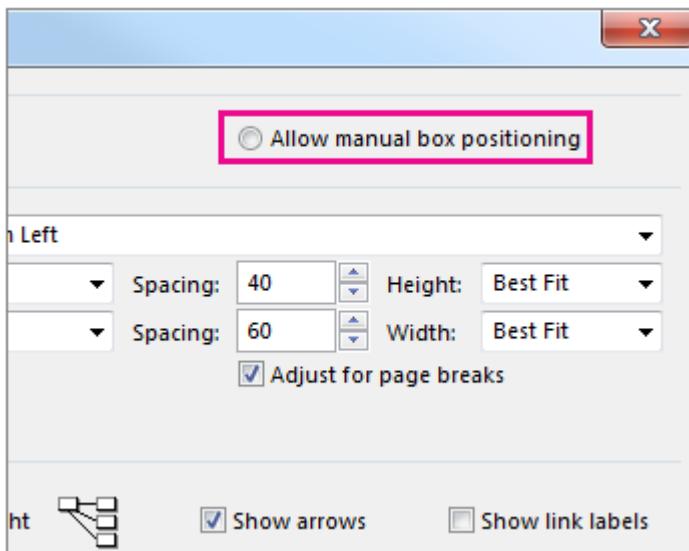
Under Box Layout, choose the box arrangement, alignment, spacing, height, and width that work best for you. To space boxes evenly, select Fixed in the Height and Width boxes.

Keep in mind that grouped tasks are positioned automatically. You'll need to undo grouping if you want to change them.



Manually change the way boxes are laid out

If you've gotten this far and still don't like how your boxes are positioned, click **Format > Layout**, select **Allow manual box positioning**, choose **OK**, and then drag the boxes to the spot you want.



If you manually reposition a task, you can change the layout of any linked tasks or subtasks associated with it by right-clicking on the task and choosing **Layout Related Tasks Now**.

Change the line style between boxes

If you have a lot of tasks that you've linked to predecessor or successor tasks, the links between boxes can be really hard to follow. Try changing the line style, and then arranging them in way that's easier to see.

- Choose View > Network Diagram.
- Choose Format > Layout.

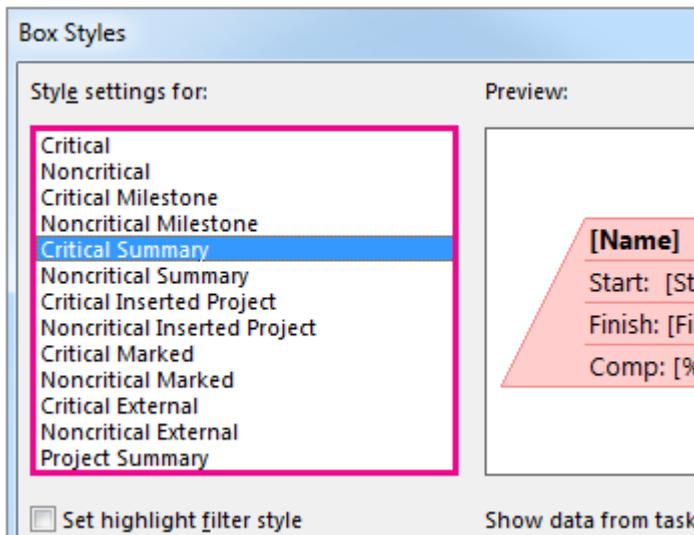
- Under **Link style**, select **Rectilinear** or **Straight**. Rectilinear links look like this  , and straight links look like this  .
- Select **Show arrows** to add arrows that point to predecessor and successor tasks. Select **Show link labels** to add dependency and lead or lag time to the link line.

Choose what kind of task information to show

- If things are looking cluttered (or you start to experience information overload), try changing the task information in each box so you only see what's most important.
- Choose View > Network Diagram.
- Choose Format > Box Styles.



In the Style settings for list, select the task that you want to change.



- Under **Border**, choose the shape, color, width, and gridline options to create the look you want.
- Select a name under **Data template** to apply your changes to an existing template. To create a new template that will use your changes, choose **More Templates**, and then choose **New** (to create a new template), **Copy** (to base the new template on an existing one), **Edit** (to change a template), or **Import** (to import a template from another project).
- Choose **OK**.

Lab Task

The SDLC has phases:

- Initiation
- Planning and requirement gathering
- Designing
- Development
- Testing
- Deployment

Create a network diagram of these phases showing properly:

1. milestones,
2. predecessors,
3. summary tasks and
4. resources.



Lab 28 & 29

Introduction to Asana

Introduction: Getting started with asana

Problem Statement:

- Getting started with asana
- Creating profile, adding team members
- Starting a new project
- Assigning tasks, subtasks, deadlines
- Adding attachments



What is Asana?

Asana is an Online Project Management App where you can Organize:

- Projects
- Tasks
- Team members

With Asana you can set:

- Project milestones
- Assign tasks to teams
- See current status
- Assign tasks with due dates
- See current projects
- And real time update when any changes are made

It makes it easier for people to work together as a **team**.



Asana works with PC, iOS, and Android



Asana for iOS, iPad, and Android

Made by Asana

Download Asana on your iPhone, iPad, or Android device to plan your day, share ideas, and get team updates on the go.

MORE INTEGRATIONS



Get Asana for your iOS or Android device

iPhone and iPad

1. Download our Asana app from the [App Store](#)
2. For help getting up to speed, read our [iOS Quick Start Guide](#)

Android

1. Download our Asana app from the [Google Play Store](#)
2. For help getting up to speed, read our [Android Quick Start Guide](#)

Feedback & Support

[Asana Support](#)

and integrates with other Apps too

The screenshot shows the Asana Apps & Integrations page at <https://asana.com/apps>. The page features a header "Asana and the tools you love, united" and a sub-header "Try out these integrations to make tracking your work even easier!". Below this, there's a "App Spotlight" section with cards for Dropbox and Google Sheets. The main area is titled "App Directory" and contains a grid of integration cards:

- HipChat**: Map any Asana project to a Hipchat room and subscribe to notifications when items are added.
- Instagantt**: Create Gantt charts, schedule tasks in Asana, and see task dates and dependencies.
- Box**: The Box app is built into the Asana interface, allowing users to attach Box files directly to Asana tasks.
- Okta**: Okta provides secure single sign-on (SSO) access to Asana.
- Dropbox**: The Dropbox file browser is built into the Asana interface, allowing users to upload files directly to Asana.
- Google Sheets**: Create spreadsheets and powerful calculations. Both can be connected to Asana so you don't have to switch between them.
- Google Drive**: The Google Drive file browser is built into the Asana interface so you can easily select files directly in Asana.
- Chrome Extension**: Map tasks to a Chrome extension where there are changes in your Asana environment.
- Slack**: Post updates to a Slack channel when there are changes in your Asana environment.

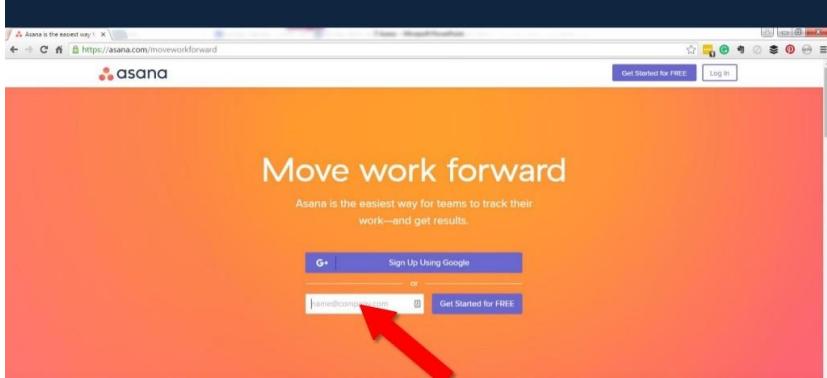


How to create an account on asana?

Type “asana.com” and press “Enter”



Type your email here



And click “get started for free”



Click this to go to your email inbox

The screenshot shows a web browser window for Asana. At the top, there's a navigation bar with links for 'Get Started for FREE!', 'Log In', 'ASANA Product Customers', 'ABOUT US Blog Company', 'SUPPORT Asana Guide Help iOS Terms & Privacy', and 'APPS & SOCIAL Integrations iOS Android'. The main content area has a colorful background with abstract shapes. It displays a message: 'Thanks for joining Asana. Check your email and click the verification link to start getting work done in Asana.' Below this is a blue button labeled 'Open your Gmail inbox'. A large red arrow points directly at this button.

Click this to open email from Asana

The screenshot shows a Gmail inbox. The search bar contains 'Complete your Asana sign up - Verify your email address You're o...'. Below the search bar, there are icons forCompose, Trash, and More. An email from 'Asana <no-reply@asana.com>' is listed with the subject 'Complete your Asana sign up - Verify your email address You're o...' and the timestamp '2.22 AM (15 hours ago)'. A red arrow points to the subject line of the email.

Click this to verify your email address

The screenshot shows an email from 'Asana <no-reply@asana.com>' with the subject 'Complete your Asana sign up'. The email body contains the text 'You're one click away...' and a blue button labeled 'Verify your email address'. A red arrow points to this button. Below the button, there is small text: 'You've received this email because you requested an [asana.com](#) account with this email address. If you didn't intend to, you can ignore this email—the account hasn't been created yet.' At the bottom, it says 'Having trouble with that button? Copy and paste this link into your browser:' followed by a link.

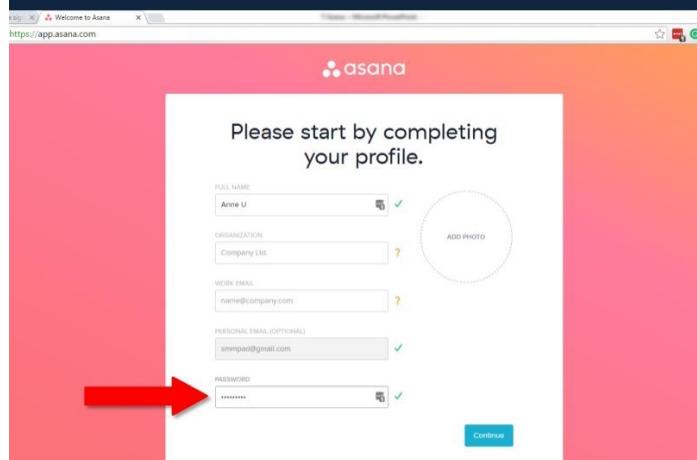


Let's create your Asana profile



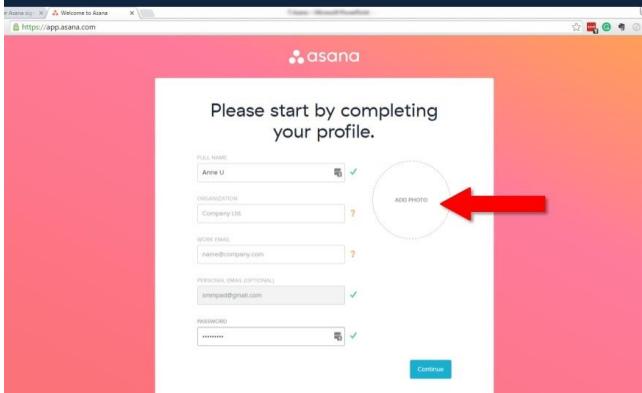
Type your name, company's name and work email.

Choose a password and type it here



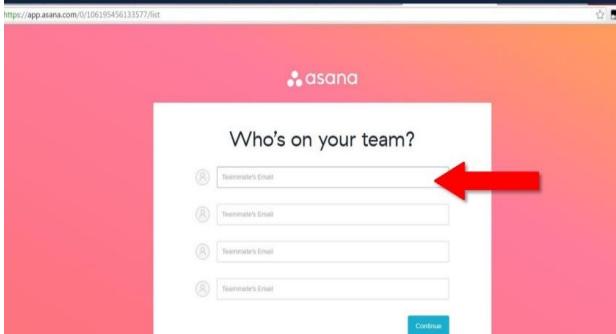


Click this if you want to add your photo
(or just skip this)

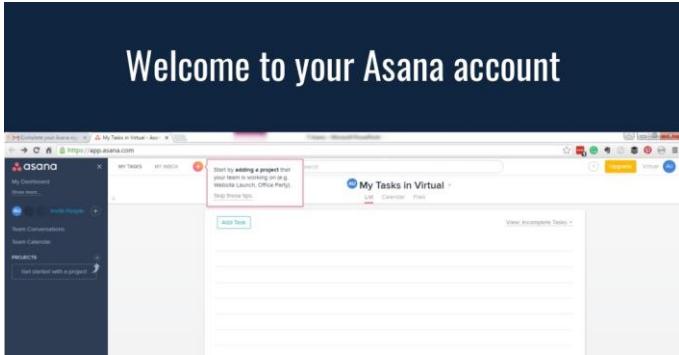
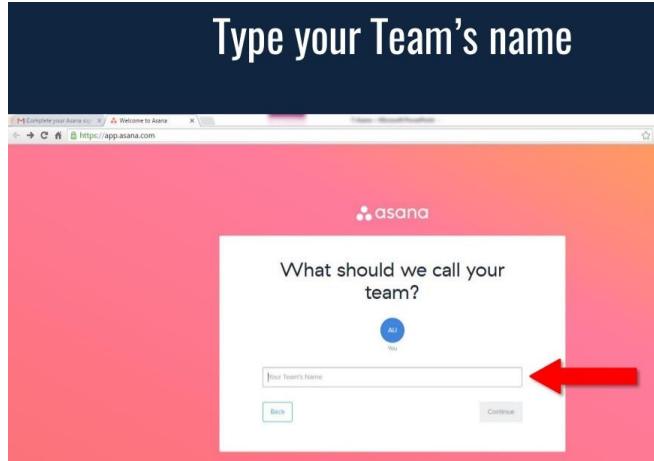


And click “continue”

Type your teammate's email here
(or skip this and add them later)



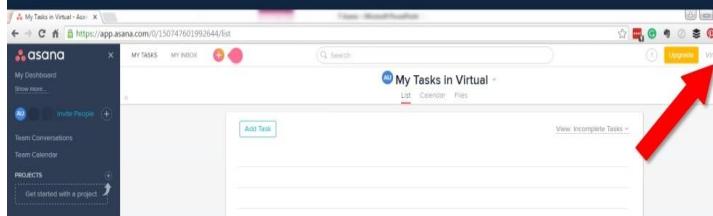
Type your Team's name



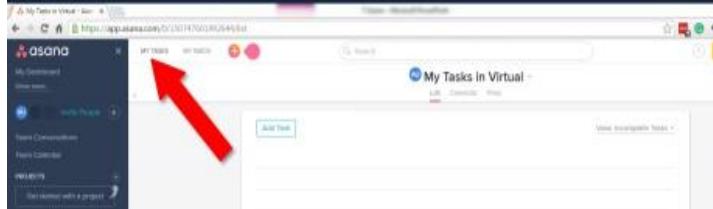


Quick tour to your Asana work space

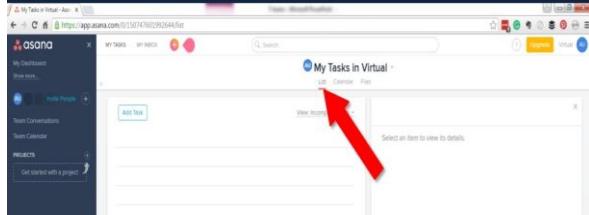
On the top-right corner is your Team's name



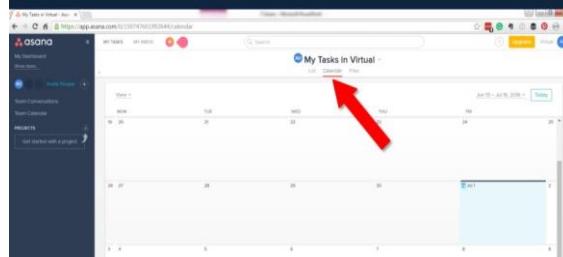
You are currently viewing “My Tasks”



Click “List” to go to List view



Click “Calendar” to go to Calendar view





Click "Files" to see your file attachments

This screenshot shows the Asana interface. A red arrow points to the 'Files' tab at the top of the main content area, which contains a small icon of a document with a lock and a key.

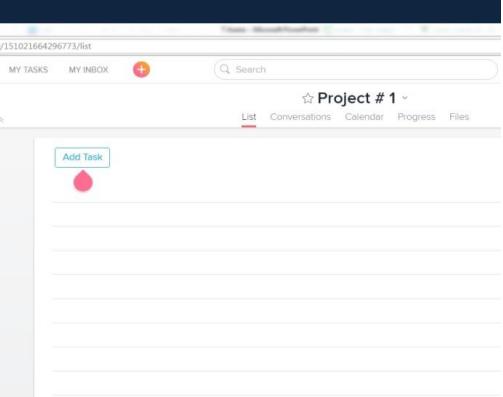
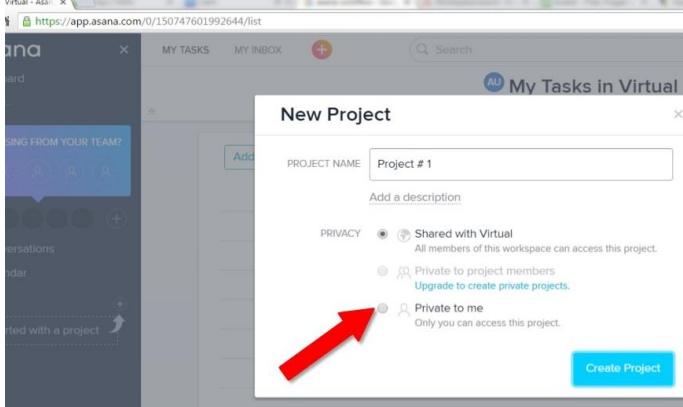
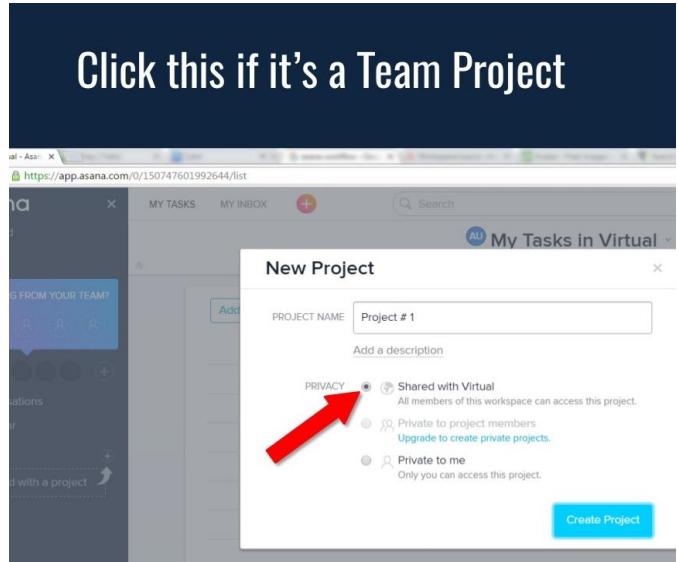
where you can click and see your Team Members

This screenshot shows the Asana interface. A red arrow points to the 'Team Members' section, which displays a list of team members with their profile pictures and names.

Asana Projects

Click this to create a project

This screenshot shows the Asana interface. A red arrow points to the 'Create a project' button, which is located at the bottom left of the sidebar under the 'PROJECTS' section.





Add tasks in Asana

Type your task here and press “Enter”

The screenshot shows the Asana interface with a large text overlay "Type your task here and press ‘Enter’". Below this, the Asana dashboard is visible, featuring a search bar, a "Tutorials" project, and a task input field labeled "Add Task". A red arrow points to the "Add Task" button.

Every task you add here

The screenshot shows the Asana interface after a task has been added. The task "Asana tutorial" is listed in the "Tutorials" project. A red arrow points to the newly added task.

will also appear here

The screenshot shows the Asana interface with the task "Asana tutorial" listed in the "Tutorials" project. A red arrow points to the task in the list.

The screenshot shows the Asana interface displaying the details of the task "Asana tutorial" in the "Tutorials" project. A red arrow points to the task details.



Click this to assign task to a team member or to yourself

The screenshot shows the Asana interface with a task titled "Asana tutorial". A red arrow points to the "Assign" button, which is located next to the "Due Date" button in the top right corner of the task card.

Click this to assign due date for the task

The screenshot shows the Asana interface with a task titled "Asana tutorial". A red arrow points to the "Due Date" button, which is located next to the "Assign" button in the top right corner of the task card.

Click this to create “Tags” for the task

The screenshot shows the Asana interface with a task titled "Asana tutorial". A red arrow points to the "Tags" icon, which is located in the top right corner of the task card.

Click this to add subtasks

The screenshot shows the Asana interface with a task titled "Asana tutorial". A red arrow points to the "Subtasks" icon, which is located in the top right corner of the task card.



See Your Project Progress

Click “Progress”

The screenshot shows the Asana interface with the 'Tutorials' project selected. The top navigation bar includes 'MY TASKS', 'MY INBOX', a search bar, and tabs for 'List', 'Conversations', 'Calendar', 'Progress' (which is highlighted in red), and 'Files'. Below the navigation is a list of tasks: 'IFTTT tutorial' due Aug 9, 'Freshbooks tutorial' due Aug 6, and 'Asana tutorial' due Aug 4. On the left sidebar, there are sections for 'Team Conversations', 'PROJECTS' (with 'Tutorials', 'Project #2', and 'Project #3'), and 'My Dashboard'.

You can add a due date

The screenshot shows the 'Tutorials' project details page. At the top, there's an 'About this Project' section with 'Anne U' and a 'Due Date' button. Below it is an 'Update Status' section with two radio buttons: 'Notify more people' (selected) and 'Remind me to update the status every Friday'. Further down is a 'Progress' section showing a chart with 1 task remaining and 2 tasks completed. A red arrow points to the 'Due Date' button.

Click on 1 of these circles to choose the current status of the project

The screenshot shows the 'Tutorials' project details page again. In the 'Update Status' section, there are three colored circles (blue, green, yellow) followed by a text input field and two checkboxes. A red arrow points to the blue circle.

And see the complete and incomplete tasks

The screenshot shows the 'Tutorials' project details page once more. It features the same 'About this Project', 'Update Status' (with a red arrow pointing to the 'Due Date' button), and a prominent 'Progress' section with a chart showing 1 task remaining and 2 tasks completed. A red arrow points to the progress chart.



On the top-left corner, click your initials

A screenshot of the COMSATS Virtual workspace interface. At the top, there is a navigation bar with icons for search, upgrade, virtual settings, and user profile. A red arrow points to the user's initials ('AU') in the top-right corner of the header. Below the header, the main area shows a list of tasks under the heading 'My Tasks in Virtual'.

Click "Virtual Settings"

A screenshot of the COMSATS Virtual workspace interface. A red arrow points to the 'Virtual Settings' option in the dropdown menu that appears when clicking the user's initials in the top-right corner. The menu also includes options like 'Personal Projects', 'Upgrade', 'More', 'My Profile Settings', and 'Log Out'.

Click "Members"

A screenshot of the 'Workspace settings' dialog. A red arrow points to the 'Members' tab. The dialog shows basic workspace information: 'WORKSPACE NAME: Virtual'. There is a 'Update Workspace' button at the bottom.

To add another member, type email here

A screenshot of the 'Workspace settings' dialog, specifically the 'Members' tab. It shows two existing members: Anne U (smmped@gmail.com) and Lisa (lisagravante@gmail.com). Below them is an 'INVITE MORE MEMBERS' section with an 'EMAIL:' input field and a 'NAME (OPTIONAL)' input field. A red arrow points to the 'EMAIL:' input field. There is a 'Send Invite' button at the bottom right.

Type member's name

A screenshot of the 'Workspace settings' dialog, specifically the 'Members' tab. It shows two existing members: Anne U (smmped@gmail.com) and Lisa (lisagravante@gmail.com). Below them is an 'INVITE MORE MEMBERS' section with an 'EMAIL:' input field and a 'NAME (OPTIONAL)' input field. A red arrow points to the 'NAME (OPTIONAL)' input field. At the bottom right of the dialog, there is a 'Send Invite' button.

And send invite





Decent Cattle Farm

The Paradise of Amateurs

Business Report

Created By:

Fatima Ijaz

FA20-BSE-046

Muhammad Ahmad

FA20-BSE-053

December 26, 2022

Disclaimer

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1 Introduction

This year, we are proud to present a robust and thriving operation that continues to grow and expand.

Our focus is on raising high-quality cattle for the Muslim community, specifically for the important holiday of Eid-ul-Azha, when many families traditionally sacrifice an animal as a way of commemorating the Prophet Abraham's willingness to sacrifice his son at God's command.

We take great care in the welfare and health of our cattle, and we are committed to providing our customers with the best possible animals for this sacred tradition.

In the following pages, we will provide an overview of our business operations, including details on our breeding, feeding, and care practices, as well as a financial analysis of the past year. We hope that this report will give you a better understanding of our commitment to excellence and the efforts we take to provide high-quality animals to the Muslim community.

2 Scope of Cattle Farming in Pakistan

The scope of dairy farming in Pakistan, specifically for the purpose of raising cattle for sacrifice on Eid-ul-Azha, is significant. As a predominantly Muslim country, Eid-ul-Azha is an important holiday for many families, and the tradition of sacrificing an animal as a way of commemorating the Prophet Abraham's willingness to sacrifice his son at God's command is widely practiced. In recent years, the demand for high-quality animals for sacrifice has increased, creating opportunities for dairy farmers to specialize in raising cattle for this purpose. The success of these businesses depends on a number of factors, including the quality of the animals, the efficiency of production and distribution, and the ability to meet customer demand.

In order to meet these challenges and capitalize on the growing demand, dairy farmers in Pakistan must implement sound business practices and invest in the health and welfare of their herds. With careful planning and attention to detail, dairy farming can be a lucrative and rewarding business in Pakistan, particularly for those focused on serving the needs of the Muslim community on Eid-ul-Azha.

3 Benefits of Cattle Farming in Pakistan

There are several benefits to operating a cattle farming business in Pakistan:



- 1. High demand:** Dairy products are an essential part of the Pakistani diet, and there is a strong and consistent demand for meat and other dairy products in the country. This demand provides a stable market for dairy farmers and can help to ensure the success of the business.
- 2. Cost-effective:** Dairy farming can be a relatively low-cost business to operate, especially compared to other types of farming. The cost of feed and other inputs is often relatively low, which can help to offset the initial investment in the herd.
- 3. Multiple income streams:** Dairy farming can provide multiple income streams through the sale of . This can help to diversify the income of the farm and reduce the risks associated with relying on a single product.
- 4. Potential for growth:** The dairy industry in Pakistan has significant potential for growth, as there is a large and growing population that is expected to continue to consume meat in the coming years. This presents opportunities for farmers to expand their operations and increase their profits.
- 5. Positive impact on the economy:** Dairy farming can have a positive impact on the local and national economy in Pakistan. It creates jobs and supports the growth of related industries, such as meat processing and transportation.

4 Business Overview

4.1 Business Summary

We are a private limited company based in Sahiwal, a city known for its fertile land in the heart of Punjab, Pakistan. Our focus is on cattle farming, specifically raising high-quality animals for sale on Eid-ul-Azha, a major Muslim holiday.

Our targeted customers are the elite of Karachi, who are willing to spend millions on purchasing animals for sacrifice on this important occasion. We are committed to providing the best possible animals to meet the needs of these customers, and we take great care in the welfare and health of our herd.

With years of experience in the industry and a passion for what we do, we are dedicated to excellence and strive to be the premier provider of cattle for Eid-ul-Azha in the region.

4.2 Owner Ship of Business

Muhammad Ahmad and Fatima are the owners of Decent Cattle Farm, a privately held company. Fatima is the CEO of the company, while Muhammad Ahmad serves as the Di-



rector and Operational Manager. Together, they oversee the management and operations of the cattle farm, ensuring that the business runs smoothly and efficiently. The company is dedicated to raising and caring for healthy, high-quality cattle, and is committed to upholding the highest standards of animal welfare and sustainable agriculture. With their combined expertise and dedication, Muhammad Ahmad and Fatima are dedicated to building a successful and reputable business that is respected by customers, employees, and industry professionals alike. Mrs. Fatima owns 60% of the shares in Decent Cattle Farm (pvt ltd.), while Muhammad Ahmad owns the remaining 40%. This means that Mrs. Fatima has a majority ownership stake in the company, while Muhammad Ahmad holds a minority stake. As the CEO of the company, Mrs. Fatima has a significant amount of control over the business, while Muhammad Ahmad, as the Director and Operational Manager, plays a key role in the day-to-day operations and management of the company. Both Mrs. Fatima and Muhammad Ahmad are committed to working together to ensure the success and growth of Decent Cattle Farm.

4.3 Profit Sharing

Ms. Fatima is entitled to 50% of the profit of Decent Cattle Farm (pvt ltd.), while Mr. Muhammad Ahmad is entitled to 40% of the profit. In addition to his profit share, Mr. Muhammad Ahmad will also receive an additional 10% of the profit as salary for his role as the Operational Manager of the business. This means that Mr. Muhammad Ahmad's total share of the profit will be 50%, with 40% coming from his profit share and an additional 10% coming from his salary. Both Ms. Fatima and Mr. Muhammad Ahmad are responsible for the success and profitability of the company, and their profit shares reflect their contributions to the business.

5 Product

Decent Cattle Farm (pvt ltd.) is a company that is dedicated to raising and caring for high-quality beef calves. These calves are raised in a clean, safe, and humane environment, and are fed a nutritious diet to ensure that they grow into healthy, robust animals. The primary product of Decent Cattle Farm is beef calves that are raised for sacrificing at Eid-ul-Azha, a major holiday in the Islamic faith. These calves are carefully selected for their size, quality, and overall health, and are treated with the utmost care and respect. In addition to raising and caring for the calves, Decent Cattle Farm also provides a range of services to support customers throughout the process of purchasing and preparing a calf for sacrifice. These services include assisting with transport and logistics, as well as providing guidance and advice on the best practices for caring for the calf before and after the sacrifice. Decent Cattle Farm is committed to upholding the highest standards of animal welfare, and is dedicated to providing customers with the best possible product and service experience.



Figure 1: Australian Imported Bread



Figure 2: Local Dhani Bread



Figure 3: Sahiwal Bread

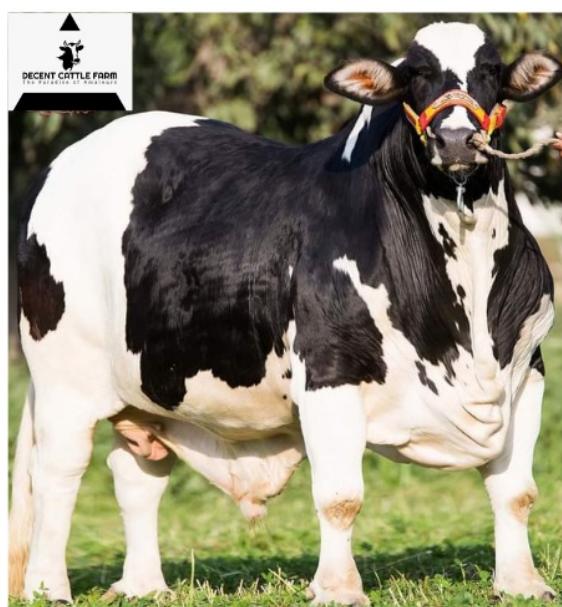


Figure 4: Australian Imported Bread



6 Market Analysis

The market for cattle farming is vast and varied, with different segments serving different needs and demand. In general, the demand for beef and other livestock products tends to be driven by a number of factors, including population growth, economic development, and cultural and dietary preferences.

One of the major trends in the cattle farming market is the increasing demand for sustainable and humanely raised livestock. Consumers are becoming more aware of the environmental and animal welfare impacts of their food choices, and are seeking out options that align with their values. Decent Cattle Farm (pvt ltd.) can capitalize on this trend by highlighting its commitment to sustainable and humane practices in its marketing and branding efforts.

Another trend in the market is the increasing demand for premium and specialty meats, such as grass-fed beef and organic livestock. Decent Cattle Farm (pvt ltd.) could consider expanding its product offerings to include these types of meats, which may command a higher price point due to their perceived higher quality and added health benefits.

Finally, the market for cattle farming is also influenced by global economic conditions and trade policies. Decent Cattle Farm (pvt ltd.) should keep an eye on these factors, as they can impact the demand for its products and the prices it can command. Overall, the market for cattle farming is complex and dynamic, and Decent Cattle Farm (pvt ltd.) will need to stay attuned to these trends in order to succeed in this competitive industry.

6.1 Market Summary

Pakistan is a major producer and exporter of livestock, including cattle. The country's cattle farming industry plays a significant role in its agricultural sector and economy, and is an important source of food, livelihoods, and export revenue.

The demand for beef and other livestock products in Pakistan is largely driven by population growth, with a rising middle class driving increased consumption of meat. The country's large and growing Muslim population also drives demand for livestock, particularly during major holidays such as Eid-ul-Azha, when the sacrifice of animals is a central part of the celebration.

Pakistan's cattle farming industry is primarily based on small and medium-sized farms, with a mix of modern and traditional production methods. The country is known for its high-quality livestock, including the famous Pakistani breed of cattle, the Sahiwal.

Despite its importance, the cattle farming industry in Pakistan faces a number of challenges, including a lack of access to credit, inadequate infrastructure and transportation, and a lack of modern, high-tech production methods. These challenges can make it difficult for small and medium-sized farms to compete with larger, more technologically advanced operations.



Overall, the market for cattle farming in Pakistan is large and growing, but also highly competitive. Decent Cattle Farm (pvt ltd.) will need to stay attuned to these trends and challenges in order to succeed in this dynamic market.

6.2 Target Market Segment

The target market segment for Decent Cattle Farms, would likely be affluent individuals and organizations that are interested in purchasing high-quality livestock for breeding or meat production. This target market segment may include:

- 1. Wealthy individuals:** Decent Cattle Farms could target affluent individuals who are interested in purchasing high-quality livestock for their own personal use. These individuals may be looking for bulls to breed or to produce meat for their own consumption or for sale to others.
- 2. Elite organizations:** Decent Cattle Farms could also target elite organizations, such as exclusive clubs or luxury hotels, that are interested in purchasing high-quality livestock for their own use or for sale to their customers. These organizations may be looking for bulls to breed or to produce meat for their own consumption or for sale to others.
- 3. Cattle farmers:** Decent Cattle Farms could also target other cattle farmers who are interested in purchasing high-quality bulls for breeding purposes. These farmers may be looking to improve the quality of their herd or to produce high-quality meat for sale to the broader market.

Overall, Decent Cattle Farms would likely target affluent individuals and organizations that are interested in purchasing high-quality livestock and are willing to pay a premium price for it. This target market segment may be interested in the heavy bulls raised by Decent Cattle Farms for their size, strength, and breeding potential.

7 Strategy and Implementation

The focus on delivering high quality is the farm's strategy. Its method of implementation is simply a reliance on the farm's reputation for delivering the best quality in a forthright manner.

7.1 SWOT Analysis

A SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis is a tool used to identify the internal and external factors that can impact an organization. Here is a potential SWOT analysis of Decent Cattle Farms, a farm that raises heavy bulls and targets the elite class:



7.1.1 Strengths

1. **High-quality bulls:** Decent Cattle Farms raises heavy bulls of a high quality, which may be a strength in the market.
2. **Elite target market:** Decent Cattle Farms targets the elite class, which may be a strength as these customers may be willing to pay a premium price for high-quality livestock.
3. **Strong reputation:** Decent Cattle Farms may have a strong reputation in the market, which could be a strength in attracting customers and building trust.

7.1.2 Weaknesses

1. **Limited product range:** Decent Cattle Farms only raises heavy bulls, which may be seen as a weakness in terms of product diversity.
2. **High prices:** Decent Cattle Farms may have high prices for its products, which could be a weakness in attracting price-sensitive customers.
3. **Dependence on a single market segment:** Decent Cattle Farms relies heavily on the elite class as its target market, which could be a weakness if this market segment experiences a downturn or changes in demand.

7.1.3 Opportunities

1. **Expansion into new markets:** Decent Cattle Farms may have the opportunity to expand into new markets, such as international markets or markets for other livestock products.
2. **Diversification of product range:** Decent Cattle Farms may have the opportunity to diversify its product range by raising other types of livestock in addition to heavy bulls.
3. **Partnerships and collaborations:** Decent Cattle Farms may have the opportunity to form partnerships or collaborations with other organizations in the industry, such as feed suppliers or transport companies.

7.1.4 Threats

1. **Competition:** Decent Cattle Farms may face competition from other farms that raise similar products or target similar markets.
2. **Changes in consumer preferences:** Decent Cattle Farms may be vulnerable to changes in consumer preferences, such as a shift towards plant-based protein sources.
3. **Economic downturns:** Decent Cattle Farms may be impacted by economic downturns, which could lead to a decrease in demand for its products.

Overall, a SWOT analysis can help Decent Cattle Farms identify its strengths and opportunities, as well as its weaknesses and threats, and make strategic decisions to address these factors.



7.2 Competitive Edge

Decent Cattle Farms, may have a number of competitive edges in the market. Some potential competitive edges for Decent Cattle Farms could include:

1. **High-quality bulls:** Decent Cattle Farms raises heavy bulls of a high quality, which could be a competitive edge in attracting customers who are looking for top-quality livestock.
2. **Strong reputation:** Decent Cattle Farms may have a strong reputation in the market, which could give it an edge in attracting customers and building trust.
3. **Elite target market:** Decent Cattle Farms targets the elite class, which may be a competitive edge as these customers may be willing to pay a premium price for high-quality livestock.
4. **Diversification of product range:** Decent Cattle Farms may have the opportunity to diversify its product range by raising other types of livestock in addition to heavy bulls, which could give it a competitive edge in attracting a wider range of customers.
5. **Partnerships and collaborations:** Decent Cattle Farms may have the opportunity to form partnerships or collaborations with other organizations in the industry, such as feed suppliers or transport companies, which could give it a competitive edge in terms of access to resources and expertise.

Overall, Decent Cattle Farms may be able to use its high-quality bulls, strong reputation, and target market to differentiate itself from competitors and gain a competitive edge in the market.

7.3 Marketing Strategy

Decent Cattle Farms, may consider a number of market strategies to achieve its business objectives. Here are a few potential market strategies that Decent Cattle Farms could consider:

1. **Price differentiation:** Decent Cattle Farms may differentiate itself from competitors by offering its products at a higher price point, targeting customers who are willing to pay a premium for high-quality livestock.
2. **Niche focus:** Decent Cattle Farms may focus on a specific niche within the cattle farming industry, such as raising heavy bulls for the elite class, and leverage its expertise in this area to differentiate itself from competitors.
3. **Diversification of product range:** Decent Cattle Farms may consider expanding its product range by raising other types of livestock in addition to heavy bulls, in order to attract a wider range of customers and increase its revenue streams.
4. **Partnerships and collaborations:** Decent Cattle Farms may consider forming partnerships or collaborations with other organizations in the industry, such as feed suppliers or transport companies, in order to access new resources and expertise.
5. **Marketing and branding:** Decent Cattle Farms may consider investing in marketing and branding efforts to increase awareness of its products and build a strong reputation in the market.



Overall, Decent Cattle Farms may consider a combination of these strategies in order to achieve its business objectives and gain a competitive edge in the market.

7.4 Sale Strategy

Decent Cattle Farms, a farm that raises heavy bulls and targets the elite class, may consider a number of strategies to increase its sales and achieve its business objectives. Here are a few potential sales strategies that Decent Cattle Farms could consider:

1. **Targeting specific customer segments:** Decent Cattle Farms may consider targeting specific customer segments, such as wealthy individuals or elite organizations, that are interested in purchasing high-quality livestock.
2. **Offering a range of products:** Decent Cattle Farms may consider offering a range of products, such as live bulls, breeding services, or meat products, in order to appeal to a wider range of customers and increase its sales.
3. **Building strong relationships with customers:** Decent Cattle Farms may consider building strong relationships with its customers by offering excellent customer service and providing support and resources to help them succeed.
4. **Promoting the benefits of its products:** Decent Cattle Farms may consider promoting the benefits of its products, such as the high quality of its bulls or the success of its breeding program, in order to attract new customers and increase sales.
5. **Using online and offline marketing channels:** Decent Cattle Farms may consider using a variety of online and offline marketing channels, such as social media, email marketing, and in-person events, to reach its target market and increase sales.

Overall, Decent Cattle Farms may consider a combination of these strategies in order to increase its sales and achieve its business objectives.

8 Management Plan

Here is a potential management plan for Decent Cattle Farms,

1. **Leadership:** Fatima, the CEO and majority shareholder of Decent Cattle Farms, and Muhammad, the director and operational manager, will lead the management team and be responsible for making strategic decisions and setting the overall direction of the organization.
2. **Organizational structure:** Decent Cattle Farms will have a hierarchical organizational structure, with Fatima and Muhammad at the top, followed by department heads and team leaders, and then employees.
3. **Decision-making:** Decent Cattle Farms will follow a top-down decision-making process, with major decisions being made by Fatima and Muhammad and then communicated to the rest of the organization.
4. **Goals and objectives:** Decent Cattle Farms will set clear goals and objectives for each department and team, and will monitor progress towards these goals on a regular basis.



lar basis.

5. **Communication:** Decent Cattle Farms will have clear communication channels in place, including regular meetings, email, and a company-wide messaging system, to ensure that all employees are informed and can collaborate effectively.
6. **Training and development:** Decent Cattle Farms will invest in training and development opportunities for its employees, in order to build their skills and knowledge and improve the overall performance of the organization.
7. **Performance management:** Decent Cattle Farms will have a performance management system in place to evaluate the performance of employees and identify areas for improvement.

Overall, this management plan outlines the strategies, processes, and systems in place to guide the operation and growth of Decent Cattle Farms, with a focus on leadership, organizational structure, decision-making, goals and objectives, communication, training and development, and performance management.

8.1 Promotion Plan

Decent Cattle Farms will target affluent individuals and organizations that are interested in purchasing high-quality livestock for breeding or meat production. Decent Cattle Farms will use a variety of marketing channels to reach its target market, including social media, email marketing, and in-person events. Decent Cattle Farms will create promotional materials, such as brochures, and flyers, to showcase its products and services. Decent Cattle Farms will consider advertising in relevant industry publications and on targeted websites in order to reach its target market. Decent Cattle Farms will work with industry media outlets to generate positive media coverage and build its reputation in the market. Decent Cattle Farms will consider forming partnerships or collaborations with other organizations in the industry, such as feed suppliers or transport companies, to expand its reach and promote its products and services.

8.2 Hiring Procedure of Staff

Here is a potential hiring process for Decent Cattle Farms:

1. **Job posting:** Decent Cattle Farms will post job openings on its website and on relevant job boards and career sites.
2. **Resume review:** Decent Cattle Farms will review resumes and cover letters from interested candidates and select those that meet the basic criteria for the position.
3. **Interviews:** Decent Cattle Farms will conduct interviews with shortlisted candidates to assess their skills, experience, and fit for the position.
4. **Reference checks:** Decent Cattle Farms will conduct reference checks with the candidates' previous employers or other references to verify their work history and assess their suitability for the position.
5. **Offer and acceptance:** Decent Cattle Farms will make an offer to the selected candidate, who will then have the opportunity to accept or decline the offer.



8.3 Who will hire the staff

The hiring process at Decent Cattle Farms will likely be led by the Operational Manager. The final hiring decision will likely be made by the CEO and Decent Cattle Farms(Pvt Ltd.).

Overall, the hiring process at Decent Cattle Farms will involve a number of steps to ensure that the best candidates are selected for the organization.

9 Daily Feed Plan and Feed Composition

A daily feed plan at decent cattle farm is well-balanced and provide the necessary nutrients for the animals to thrive. This may include hay or silage for roughage, a grain mix for energy, and a protein source such as soybean meal. The exact composition of the feed will depend on the specific needs and requirements of the animals, as well as the availability of resources and the goals of the farm.

It is important to regularly monitor the health and weight of the cattle to ensure that they are receiving an adequate amount of nutrients. The feed should be adjusted as needed to maintain optimal health and performance. It is also important to follow best management practices for feed storage and handling to prevent contamination and waste.

In addition to a well-balanced diet, it is important to provide clean, fresh water for the cattle at all times. It is also a good idea to offer a mineral supplement to ensure that the animals are receiving all of the necessary micro nutrients.

9.1 Daily Feed Plan of a Cattle

Daily Feed plan of the cattle's at Decent Cattle Farm is as follow

Table 1: Daily Feed Plan

Name	Quantity
Silage	25 Kg
Feed	12 Kg
Fresh Green Food	20 Kg

9.2 Feed Composition

Daily Feed of cattle's at Decent cattle Farms consist of different things. Details and combination of feed is given below

9.2.1 Silage

Silage is a type of feed that is made by linens (fermenting and storing) green, moist plant material, such as maize. It is a common feed for ruminant animals, such as cattle, sheep, and goats, and can be used as a source of roughage and energy.

Silage is made by harvesting the maize plant material when it is at its peak of nutrition and moisture content, and then chopping it into small pieces. The chopped material is then compacted and sealed in a container, such as a silo or bale, to exclude air. The absence of oxygen allows the natural fermentation process to occur, which preserves the nutrients in the feed and reduce the risk of spoilage.

In a decent cattle farm, silage can be an important part of the feed plan, especially during times when fresh forage is not available or when the animals need additional energy to support growth. It is important to carefully plan and manage the use of silage to ensure that the animals receive a balanced and nutritious diet.

9.2.2 Feed

The feed for cattle's at a decent cattle farm consist of a variety of ingredients, including wheat, maize, soybean, calcium powder, and other vitamins and minerals. These ingredients may be included in the feed to provide the necessary nutrients for the animals to thrive and support their growth, reproduction, and milk production.

Wheat and maize are commonly used as sources of energy in cattle feed. They provide carbohydrates, which are an important source of energy for the animals. Soybean is a good source of protein, which is necessary for muscle development and maintenance. Calcium powder is an important mineral that is necessary for strong bones and teeth, and it may be included in the feed to ensure that the animals are receiving an adequate amount of calcium.

Other vitamins and minerals may be included in the feed to support the overall health and well-being of the animals. For example, vitamin A is important for good vision, and vitamin D is necessary for the absorption of calcium. Minerals such as phosphorus, sodium, and magnesium are also important for the proper functioning of the body.

9.2.3 Fresh Green Food

Providing fresh green food for cattle's at a decent cattle farm is a important way to ensure that the animals receive a varied and nutritious diet. Fresh green food, such as grass or legumes, is a good source of roughage, which is necessary for maintaining the health of the cattle's and supporting the overall digestive process. It is also a good source of nutrients, including protein, vitamins, and minerals.

There are several ways that fresh green food can be provided to cattle's at a decent cattle farm. One option is to allow the animals to graze on pasture land, which can provide a natural source of fresh green food. This may involve rotating the animals between different pastures to allow the grass to regrow and to prevent overgrazing. Alternatively, the



animals may be fed fresh green food in the form of hay, jawar, and barseem.

10 Expense Report

A expense report for Decent Cattle Farms, would assess the viability of the business idea and identify any potential risks or challenges that may need to be addressed. The expense report would likely include an analysis of the market for heavy bulls and other livestock products, the competition in the market, the costs and revenues associated with operating the farm, and any potential risks or challenges that may impact the success of the business. The report may also consider factors such as the location of the farm, the availability of feed and water, and transportation infrastructure. Overall, a expense report for Decent Cattle Farms would provide a detailed analysis of the potential opportunities and challenges associated with the business idea and help the organization make informed decisions about whether or not to pursue it.

10.1 Per Cattle Expense

An expected expense report for Decent Cattle Farms, would outline the costs that the organization can expect to incur in order to operate the farm. These costs may include:

Table 2: Per Cattle Cost

Name	Amount
Buying Price	300,000
Silage	100,000
Feed	150,000
Green Food	20,000
Insurance	15,000
Medicine	15,000
Total Cost Per Cattle	6,00,000

10.2 Total Fix Cost

Fixed costs are expenses that a business incurs that do not vary with changes in the volume of goods or services produced. These costs are typically consistent regardless of how much the business produces, and they are often referred to as "overhead" costs. Fixed Cost expense of Decent Cattle Farms are

Table 3: Total Fixed Cost

Name	Amount
Pay	960,000
Electricity	480,000
Promotion	260,000
Depreciation	300,000
Total Fixed Cost	2,000,000

10.3 Taxes and Other Government Duties

In Pakistan, the cattle farming is considered an agricultural produce and therefore exempt from taxes. The Federal Board of Revenue has allowed special Exemption to Growers of Agricultural Produce through a circular. According to the Circular, the Clause (12) of Part-IV of Second Schedule to the Income Tax Ordinance 2001 (XLIX of 2001) has been substituted through SRO 787(I)/2Q11 dated 22nd August 2011, in order to allow specific exemptions / Concessions in withholding tax deductible under clause (a) of sub-section (1) of section 153 to the following categories:

On sales made by growers of agricultural produce;

Since the agricultural income as defined in Section 41 is exempt under the Ordinance, subjecting the growers to the withholding regime under section 153(1)(a) on sale of agricultural produce. Therefore, their sale receipts from agricultural produce have been exempted from withholding tax. The expenditure on purchase of agricultural produce from its grower has also been exempted from the applicability of clause (I) of section 21, which requires payment through crossed banking instruments / banking channel.

11 Capital Required

Capital refers to the resources that a business or organization uses to fund its operations, investments, and expenses. In the context of a cattle farm, capital requirements refer to the funds that are needed to start and maintain the operation.

Starting a cattle farm can be a significant investment, as it requires the acquisition of land, buildings, equipment, and livestock. The total capital required will depend on the size of the operation and the specific needs of the farm. This could include costs such as purchasing land and building infrastructure, such as barns, sheds, and fencing. It may also include the cost of purchasing livestock and any necessary equipment.

As Decent Cattle Farms(Pvt Ltd.) already involved in this business so company already own a farm, and all the necessary commodities which are needed for cattle farming so company didn't need capital for that.

The total capital need to start operation with 20 cattle's is as follow



Table 4: Total Capital Required

Name	Amount
Total Cost of Cattle's	12,000,000
Total Fix Cost	2,000,000
Total Capital Required	14,000,000

12 Profit Calculation

Profit is an important measure of the financial performance of any company, as it can indicate whether the company is generating sufficient income to cover its expenses and provide a return on investment. By carefully tracking and analyzing profit, company can identify areas where they can reduce costs or increase efficiency, and make informed decisions about the future of the company.

Total expected profit of company for this year will be It is difficult to accurately estimate

Table 5: Profit Calculation

Name	Amount
One Cattle Selling Price	1,800,000
Total Revenue	36,000,000
Total Expenses	14,000,000
Profit	22,000,000

the expected profit percentage of a cattle farm without more information about the specific farm and its operations. There are many factors that can impact the profitability of a cattle farm, including the size and location of the farm, the type of livestock being raised, the efficiency of the operation, and market conditions.

In general, the profit margin for a cattle farm can vary widely, and it is not uncommon for farms to experience fluctuations in profitability from year to year. Some farms may be able to achieve profit margins of 65% or more, while others may struggle to break even. Decent Cattle Farm last year achieve 68% profit and this year our goal is to meet the above calculation and increase our profit percentage by 4% from 68% to 72%.

13 Conclusion

In conclusion, the Decent Cattle Farms business report provides a comprehensive overview of the farm's operations, financial performance, and future prospects. The farm has demonstrated strong growth in recent years, with increasing revenues and profits, and a growing customer base.

However, the report also highlights several challenges and risks that the farm may face in the future. These include market fluctuations, changes in consumer demand, and increas-



ing competition. To address these challenges and maintain its growth, the farm will need to continue to focus on improving efficiency, reducing costs, and adapting to changes in the market.

Overall, the report suggests that Decent Cattle Farms is a well-run and financially stable operation, with good potential for future growth. With careful planning and execution, the farm can continue to thrive and meet the needs of its customers.