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Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

Asset Tracking using RFID
Project Report

ITE2014 -Software Project Management

E2

B.TECH

in

Information Technology

By

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Under the guidance of

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Abstract

Majority of services are using cloud computing and data centres. Thus, most of the user's data is stored in a datacentre and cloud even if the user is not using cloud directly. Hence, the security in data centre has become important. data centre is highly protected from the outside, what are you doing to protect your facility from internal factors? Data centre downtime can have severe financial and legal obligations because you're dealing with corporate data, intellectual property, and maintaining strict service level agreements. Plus, as the Internet of Things (IoT) continues to expand to all facets of our lives, uptime and connectivity are more important now than ever.

Reasons for Data Centre Downtime

According to one source, data centre failures were due to the following reasons:

- 29% – System Failure
- 24% – Human Error
- 15% – Water/Heat or Air Conditioning Failure

As we can see, the most common issues are all internal related and not due to external influences. In addition, most would agree these issues are preventable. But How?

RFID – innovative technology that can easily solve the most common reasons for data centre downtime. Here's how RFID can help:

RFID Asset Tracking

Not too long-ago companies worked with a data centre to implement an RFID asset tracking solution. The issue was that their staff was spending a lot of time tracking various assets that were installed across their data centre. The result? companies were able to take what previously was a four-week manual process down to three days!

RFID asset tracking gives you immediate insight into where your equipment is at all times which can prevent human error and misplaced equipment

What Can RFID do for you?

- Enhance your current inventory strategy
- Reduce the need for physical asset contact
- Reduce the search for assets
- Reduce the burden on resources

What RFID will NOT do for you?

- Eliminate the need for physical asset verification
- Read assets from a long distance (over 12ft.)
- Eliminate the search for assets in the field
- Eliminate the need for dedicated inventory resources
- Eliminate the need for further asset verification
- Is not a “one size fits all” solution

Tool-Paymo

Paymo is an **online project management** application dedicated to freelancers and small & medium businesses (SMBs) from industries like Web Design & Development, Creative Agencies, Software & IT Services, Architecture & Construction, Legal Services, Marketing & Social Media and Business Consultants.

The main focus of the app is to help teams with **task management, resource scheduling, collaboration, time management, and project accounting** - allowing you to manage projects from start to finish.

The project management features enable you to create tasks, group them into task lists, set due dates, priorities & milestones, assign them to users, and get a visual overview of your team's progress with Kanban boards, Gantt charts and Team Scheduling.

You can track time using mobile, desktop and online timers or simply add time entries manually from the Timesheet section.

Once your work is done you can go ahead and invoice your client, add unexpected expenses or create estimates for future projects.

Features of Paymo

1. Team Collaboration:

- Activity Stream
- Notifications

2. Time Management:

- Time Clock
- Time Tracking
- Add Bulk Time

3. File Management:

- Attach Files
- File Organization
- Unlimited Storage Space

4. Customization:

- Additional Languages
- Customizable Dashboard
- Customizable Workspace

5. Mobile:

- Android App
- iPhone App

6. Reporting:

- Time Reports
- User Reports
- Report Exporting
- Report Sharing

7. Invoicing:

- Create Estimates
- Create Invoices
- Direct Payments
- Email Templates

Case Study

One would think the assets in a data centre would be static and easy to monitor. In practice, this isn't the case. Data centres may be expanded to add more capability or capacity, consolidated from older, less efficient facilities, or reorganized to address electrical/cooling requirements. In addition, the engineering team will often relocate assets to improve workflows or to develop applications for specific customers. Tracking the movements, ownership, and lifecycles of these assets through these changes is a difficult problem.

Until recently, using barcodes and lots of people with hand scanners was the technology of choice. Unfortunately, this was time-consuming, error-prone and, ultimately, expensive. Improvements in RFID tags and readers, and the advent of sophisticated data centre IT asset management software, are reducing the time and effort needed for this task. RFID IT asset management – using RFID tags and either handheld readers or mobile carts – is significantly more efficient, more accurate and less costly than barcode IT asset management.

San Diego Gas and Electric (SDGE) is implementing a data center RFID asset tracking solution. The purpose of the system is to aid in keeping track of the various assets that are installed in the data centers and reduce the time and cost of completing asset inventories. In addition to the mobile asset inventory solution, SDGE also would like to install fixed reader portals at the entry/exit points of the data centers to capture tagged assets as they come and go.

With all the asset information loaded into tracking software and the assets assigned RFID tags, the system is ready to function in its intended role, the efficient management of asset data. An inventory of all assets was taken after tagging was complete in order to assign the most up to date location information to all assets. This information was then be exported for analysis and reporting and imported into other systems.

As new assets are purchased and brought into the asset population, they will follow the new RFID tag assignment process.

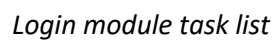
Asset inventories will be periodically performed per SDGE protocols using the mobile RFID reader to update and validate the asset population's locations and supplemental information. Prior to the inventory, synchronization of the handheld to one of the tracking software workstation installations is required in order to place the most recent asset information on the handheld.

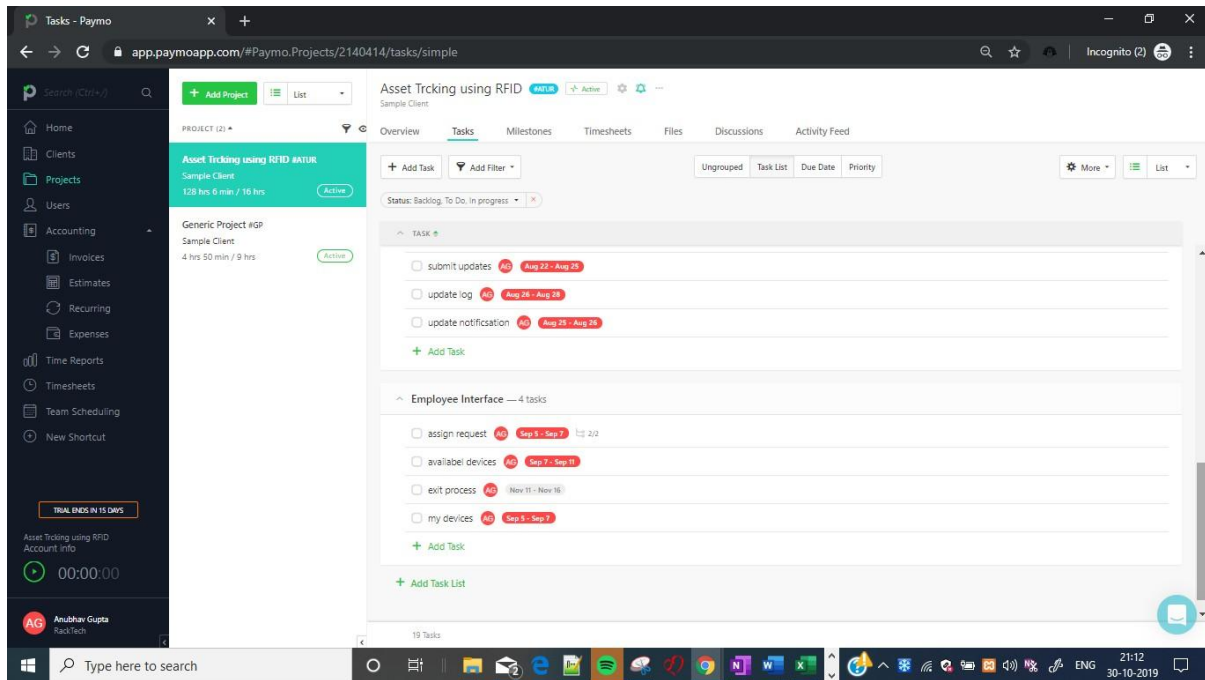
The following benefits for SDGE were recognized:

- Accurate asset inventory by location and department
- Government compliance met for asset reporting
- Proactive help desk support for asset repair
- Less inventory needed to support the team
- Product Life Cycle Management of IT assets
- Safe and eco-friendly asset disposal

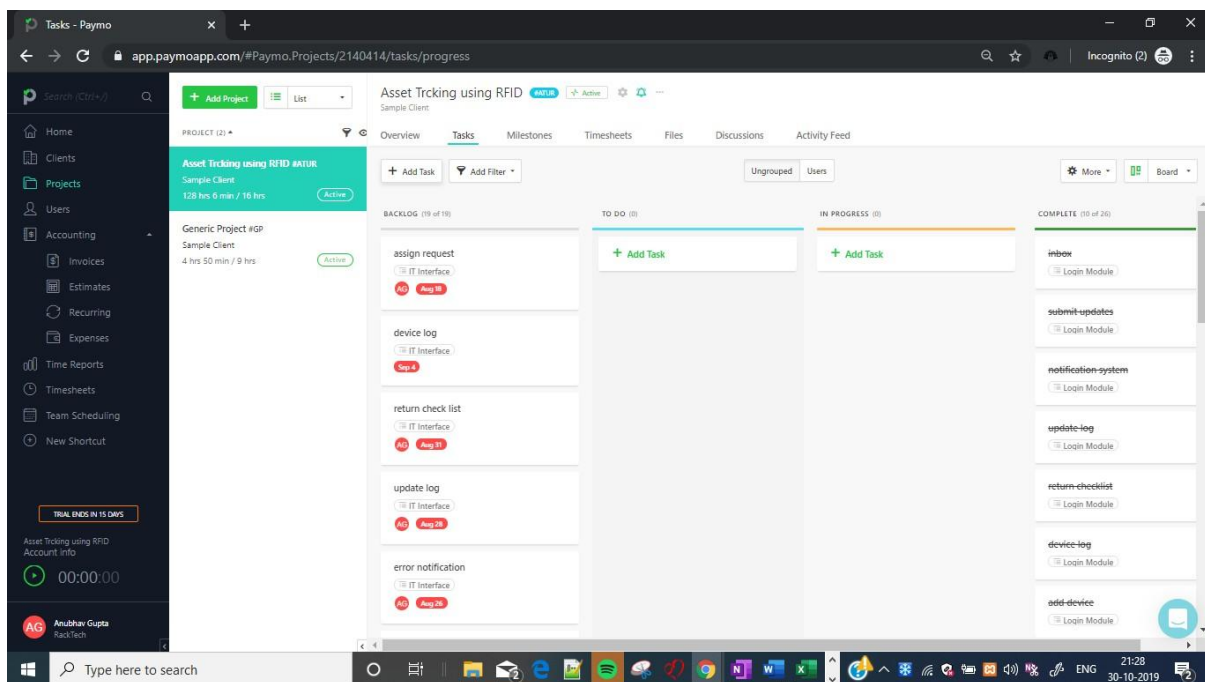
Task list along with time duration and assigned worker

There are 3 task lists and each task lists have subtasks which are arranged according to time. The red dates are showing that the task due date has been passed. The 3 task lists are login module, IT interface and Employee interface.





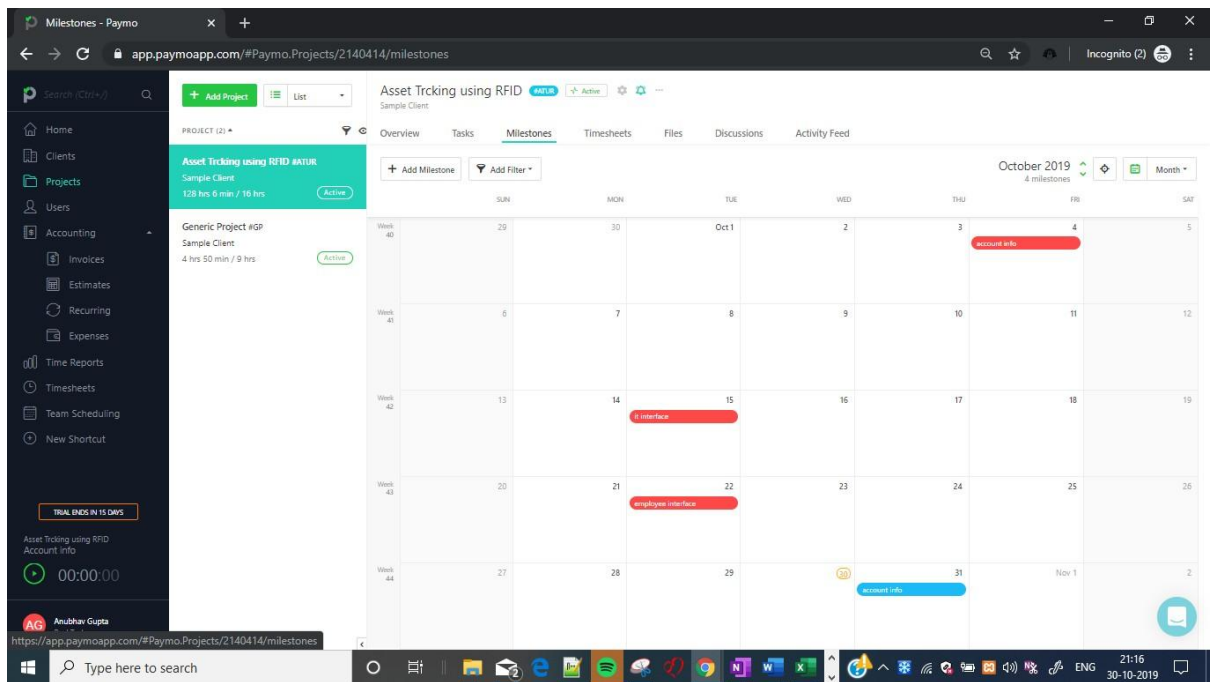
Employee interface task lists



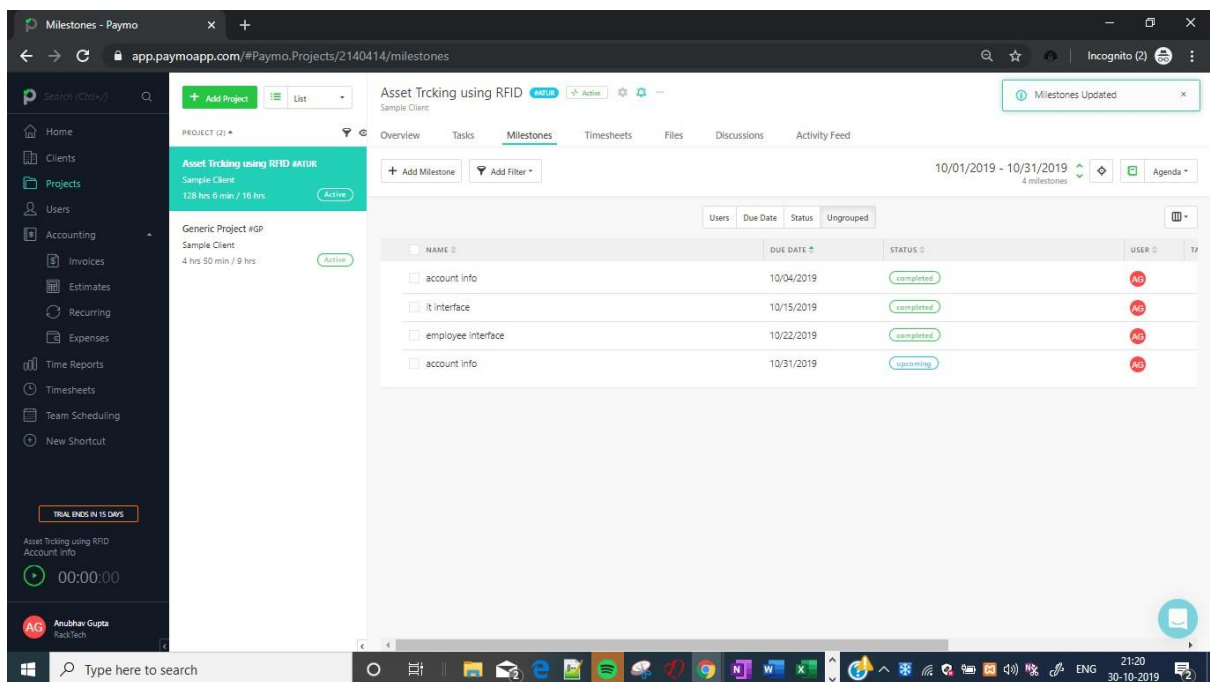
Task list for manager providing bird's eye view on the status of all the project tasks and progress

Milestones

Once each task list is completed, they are added as milestone in the calendar. Each task list represents a component/module in our system.



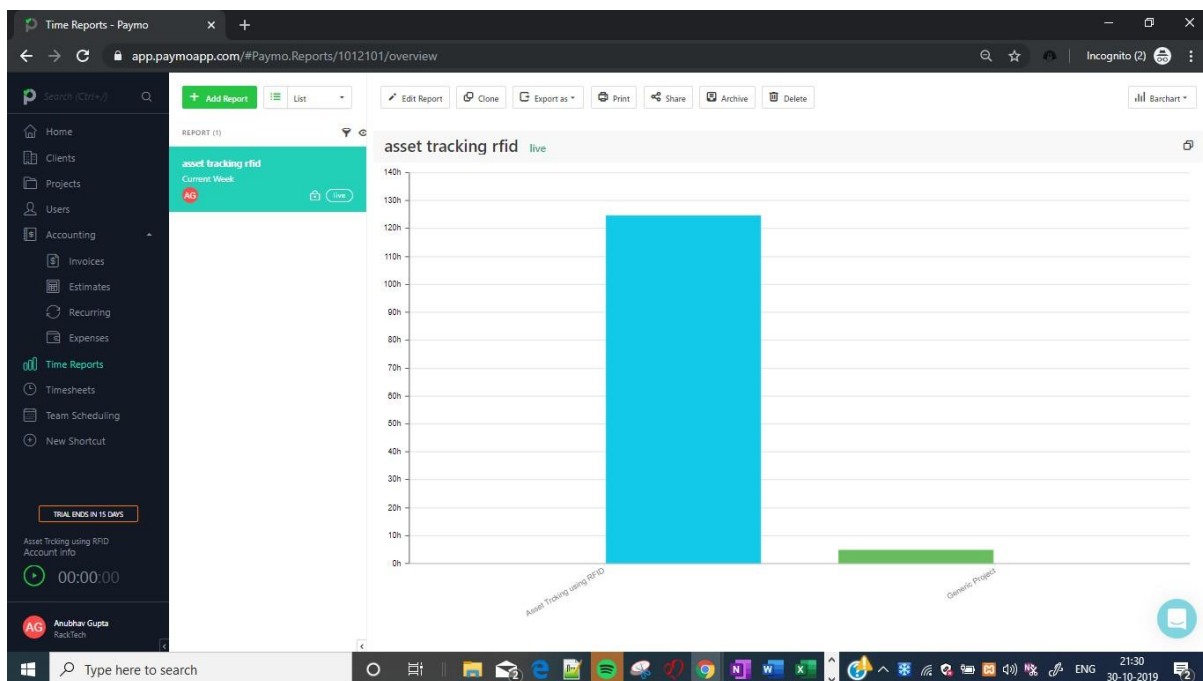
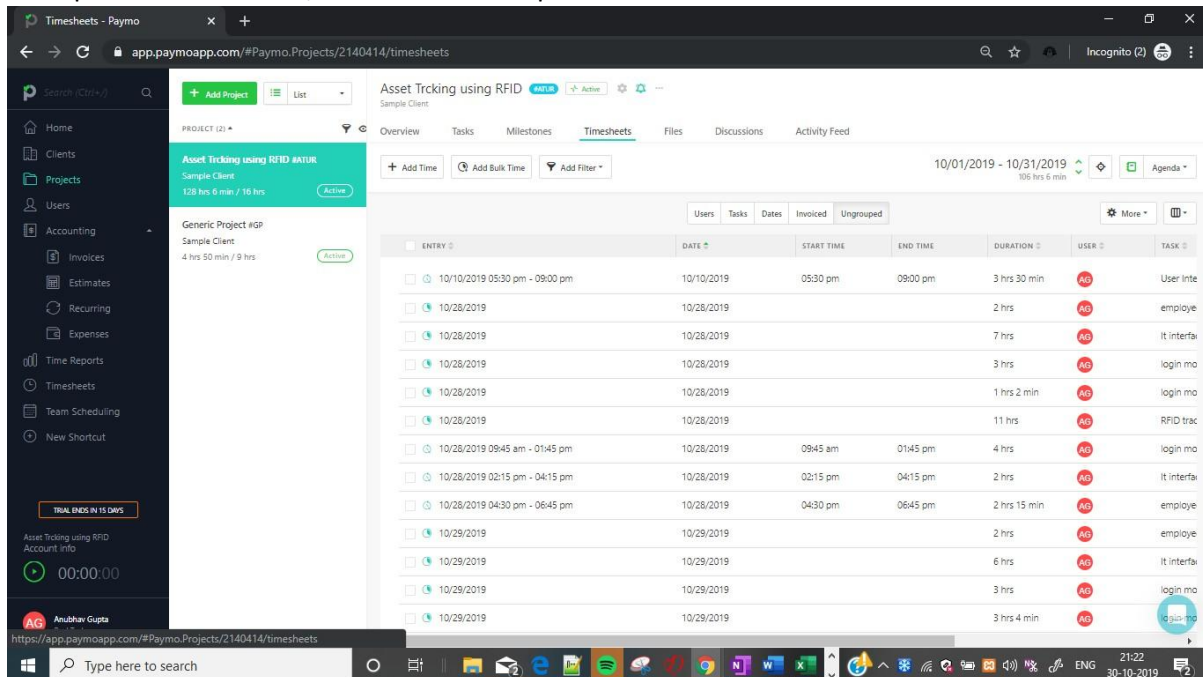
Mile-stones in calendar form



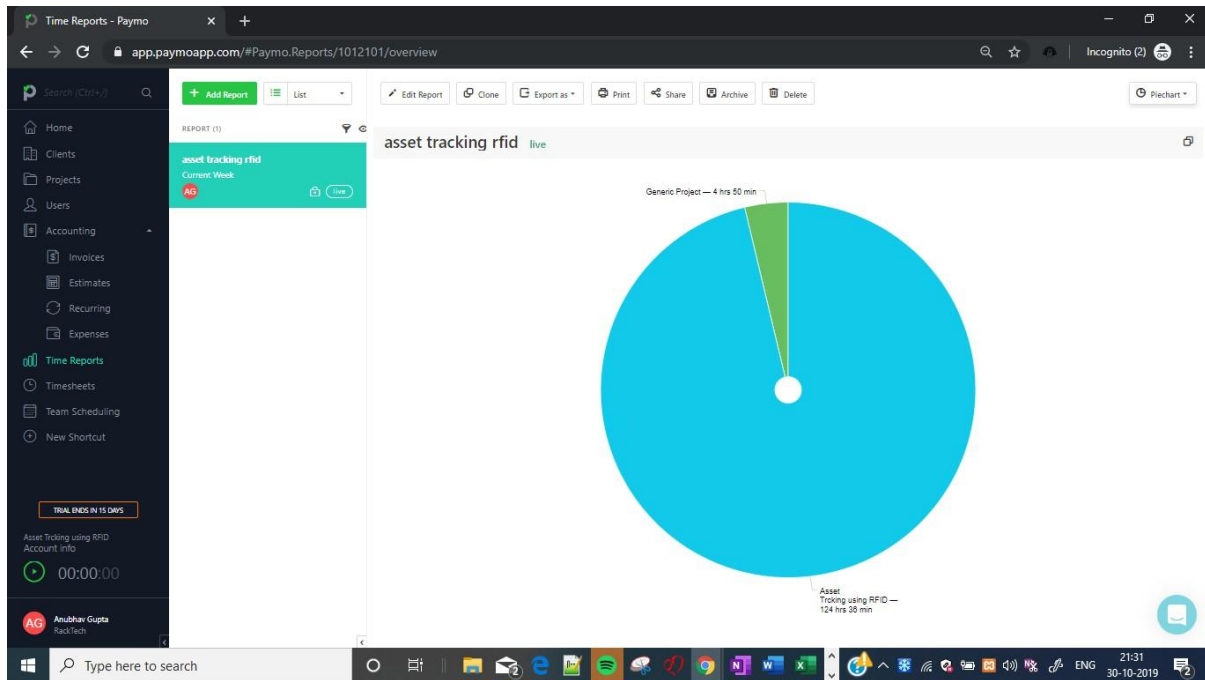
Milestones in the form of agenda

Timesheet

It keeps track of duration/number of hours spend on each task based on task lists

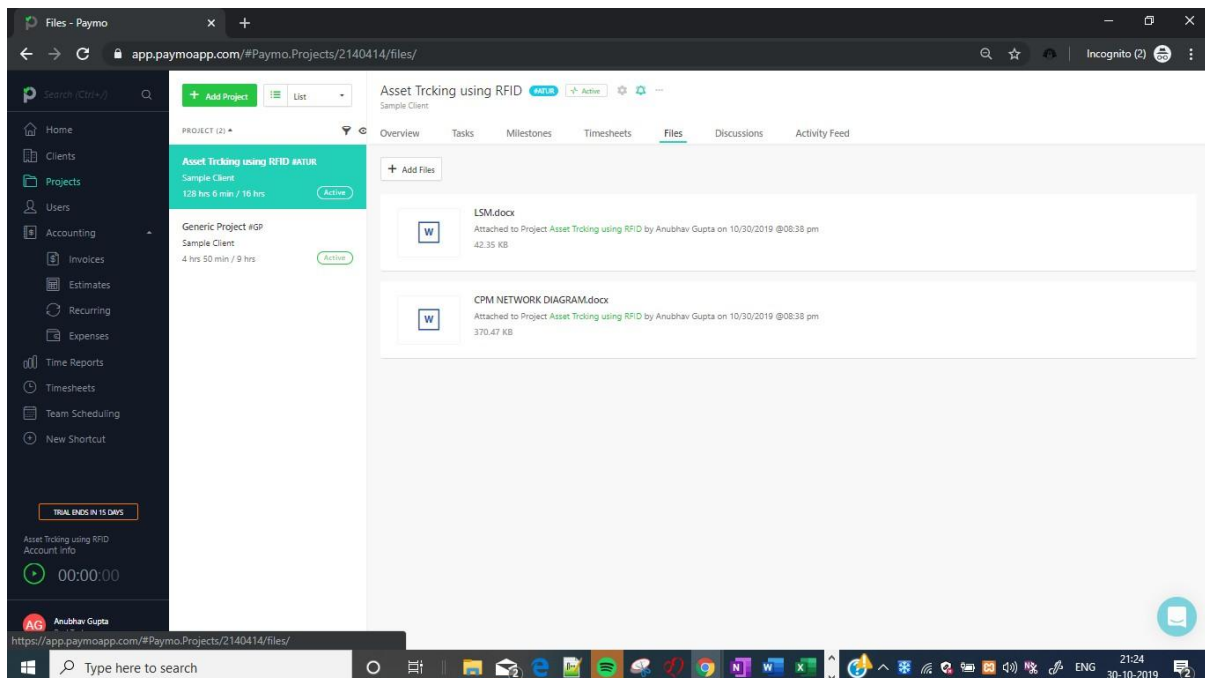


Time spent on each project for billing purposes based on time spent contracts

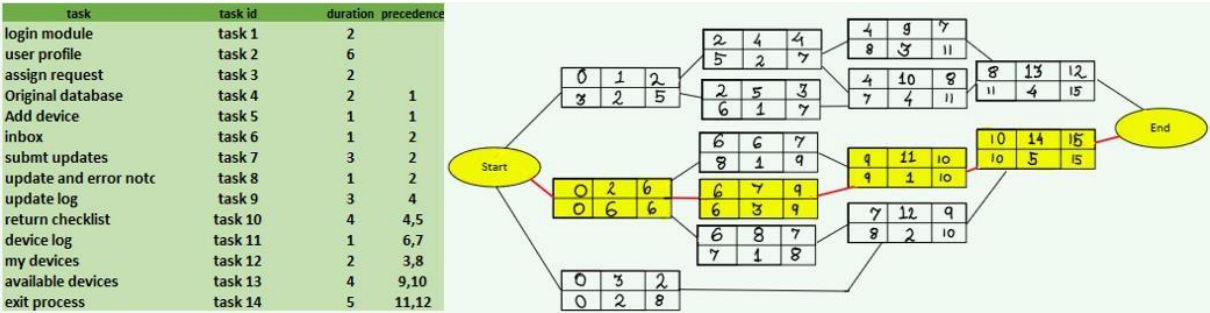


Files

It can act as github alternative where we can add the code for all the developers to see. This is an important feature for team projects especially when they are not working in the vicinity.



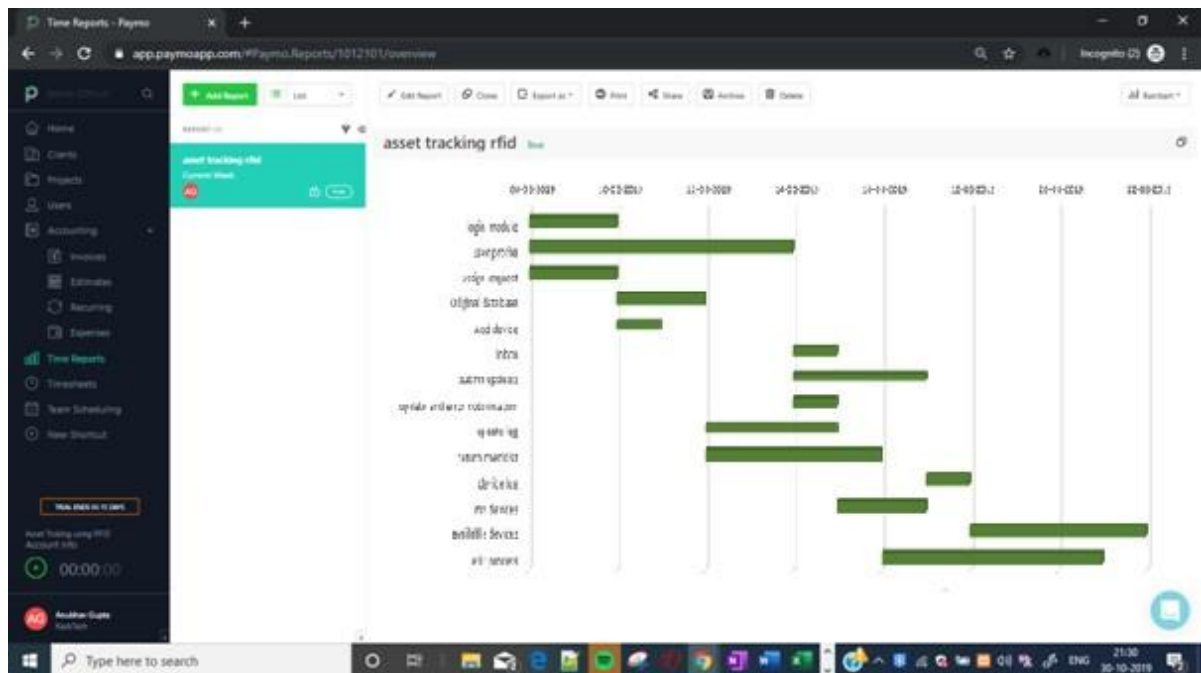
CPM NETWORK DIAGRAM



CPM diagram with tasks and highlighted critical path with following notation

Early start	Task id	Early finish
Late start	Duration	Late finish

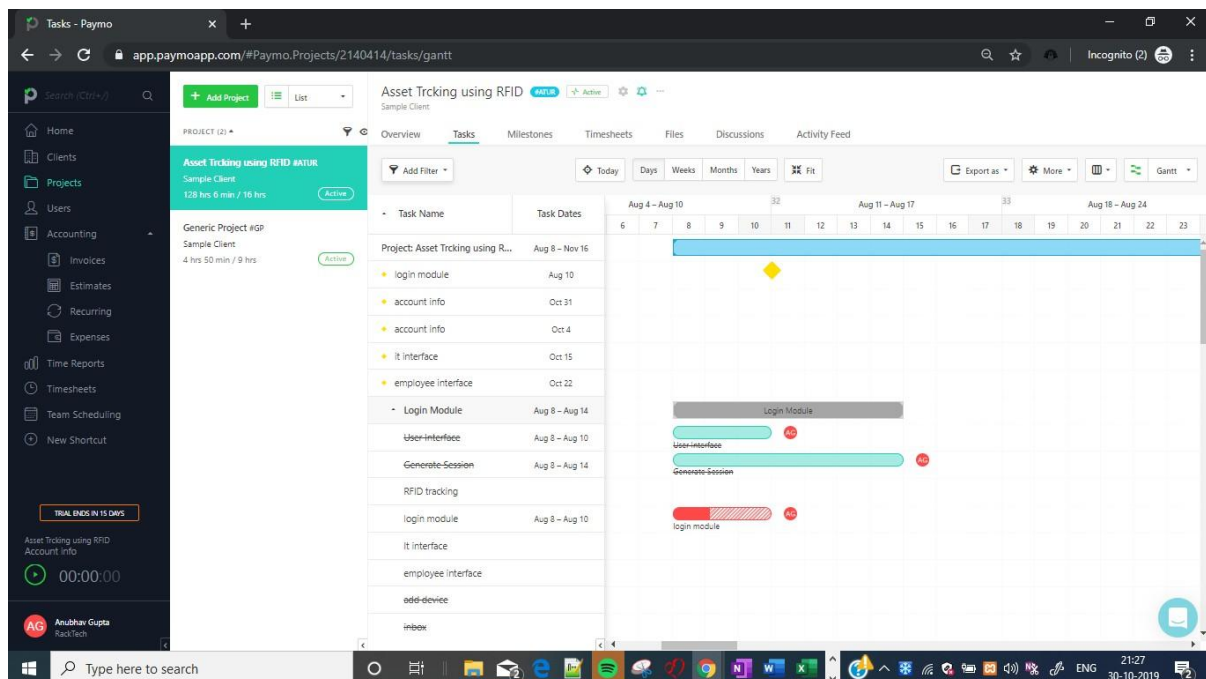
GANTT CHART



Gantt chart based on the task lists and CPM

task	duration	start date	end date	task id
login module	2	08-08-2019	10-08-2019	1
user profile	6	08-08-2019	14-08-2019	2
assign request	2	08-08-2019	10-08-2019	3
Original database	2	10-08-2019	12-08-2019	4
Add device	1	10-08-2019	11-08-2019	5
inbox	1	14-08-2019	15-08-2019	6
submt updates	3	14-08-2019	17-08-2019	7
update and error notoification	1	14-08-2019	15-08-2019	8
update log	3	12-08-2019	15-08-2019	9
return checklist	4	12-08-2019	16-08-2019	10
device log	1	17-08-2019	18-08-2019	11
my devices	2	15-08-2019	17-08-2019	12
available devices	4	18-08-2019	22-08-2019	13
exit process	5	16-08-2019	21-08-2019	14

Gantt chart in tabulate format

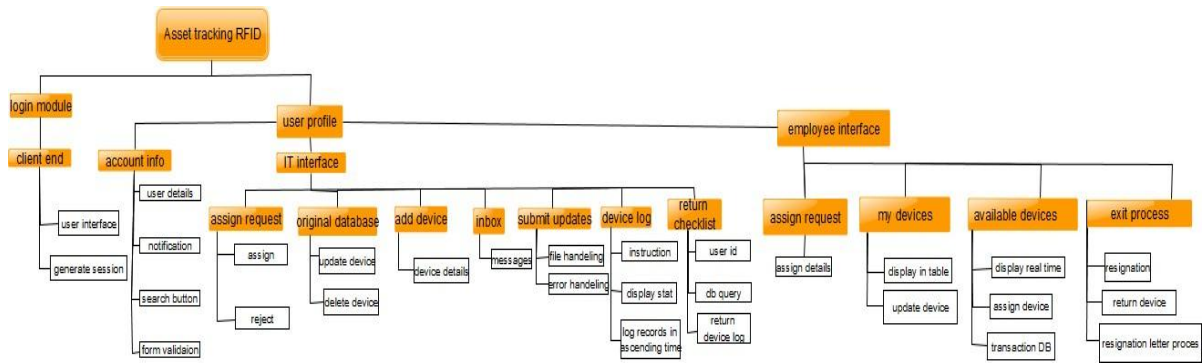


Gantt chart based on timesheet

TASK SHEET

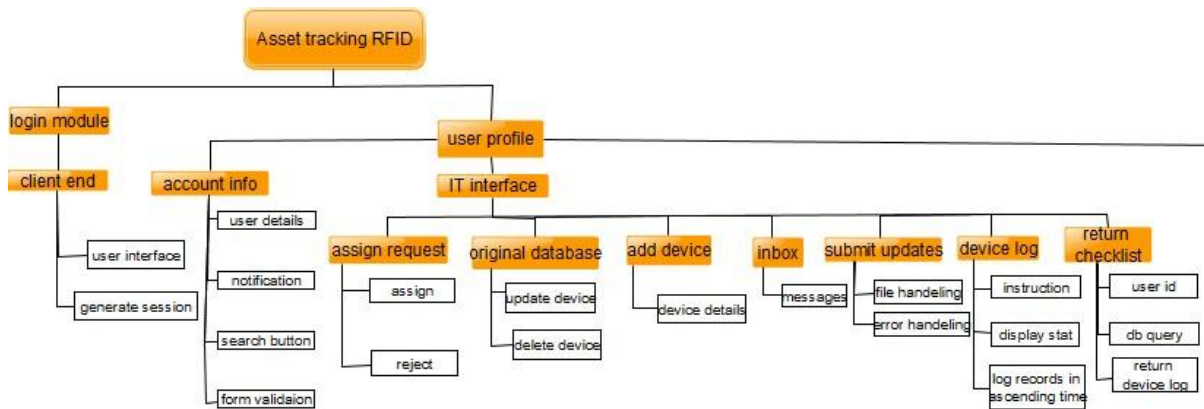
task list		duration(days)	start date	end date
RFID tracking		39	30-06-2019	08-08-2019
login module	client end			
		2	08-08-2019	10-08-2019
		2	08-08-2019	10-08-2019
	user profile	1	08-08-2019	09-08-2019
		1	09-08-2019	10-08-2019
		37	10-08-2019	16-09-2019
		6	10-08-2019	16-08-2019
		2	10-08-2019	12-08-2019
	Account info	2	12-08-2019	14-08-2019
		1	14-08-2019	15-08-2019
		1	15-08-2019	16-08-2019
	IT interface	19	16-08-2019	04-09-2019
		2	16-08-2019	18-08-2019
		1	16-08-2019	17-08-2019
		1	17-08-2019	18-08-2019
		2	18-08-2019	20-08-2019
	Original database	1	18-08-2019	19-08-2019
		1	19-08-2019	20-08-2019
	Add device	1	20-08-2019	21-08-2019
		1	20-08-2019	21-08-2019
	inbox	1	21-08-2019	22-08-2019
		1	21-08-2019	22-08-2019
	submt updates	3	22-08-2019	25-08-2019
		2	22-08-2019	24-08-2019
	update and error notoification	1	24-08-2019	25-08-2019
		1	25-08-2019	26-08-2019
	update log	1	25-08-2019	26-08-2019
		2	26-08-2019	28-08-2019
	return checklist	1	26-08-2019	27-08-2019
		1	27-08-2019	28-08-2019
		3	28-08-2019	31-08-2019
		1	28-08-2019	29-08-2019
		1	29-08-2019	30-08-2019
		1	30-08-2019	31-08-2019
	device log	4	31-08-2019	04-09-2019
		1	31-08-2019	01-09-2019
		2	01-09-2019	03-09-2019
		1	03-09-2019	04-09-2019
	employee interface	12	04-09-2019	16-09-2019
		1	04-09-2019	05-09-2019
	assign request	1	04-09-2019	05-09-2019
		1	04-09-2019	05-09-2019
	my devices	2	05-09-2019	07-09-2019
		1	05-09-2019	06-09-2019
	available devices	1	06-09-2019	07-09-2019
		4	07-09-2019	11-09-2019
		1	07-09-2019	08-09-2019
		1	08-09-2019	09-09-2019
	exit process	2	09-09-2019	11-09-2019
		5	11-09-2019	16-09-2019
		2	11-09-2019	13-09-2019
		1	13-09-2019	14-09-2019
		2	14-09-2019	16-09-2019

WBS

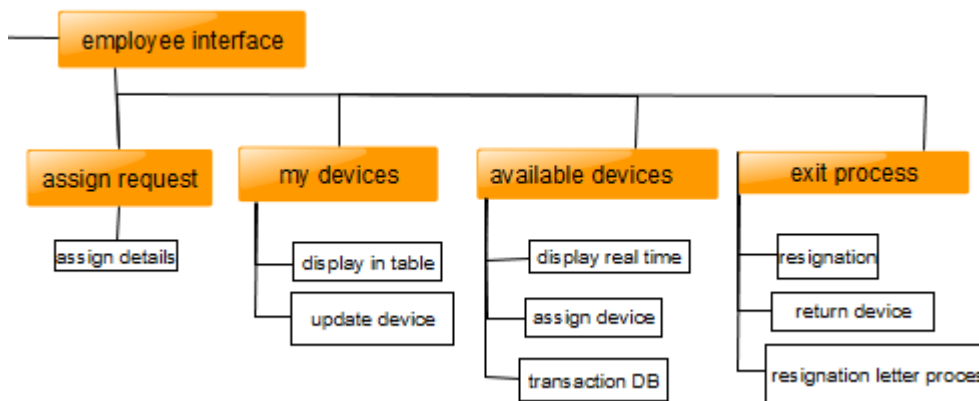


Complete WBS diagram

The complete diagram is too big and is a bit blur so we showed rest in parts



Part 1 of WBS diagram



Part 2 of WBS diagram