International Project Management

ITCPS2 Group 2

Aninda Maulik
Mohamadnour Badr
Morad Benkaraache
Dhayananth Dharmalingam

Acknowledgement

We would like to thank Mr, Piere Marrer and Olivier Boissier who guided throughout this project in order to complete this project. We also giving our thanks to the team member who worked hard to achieve our milestone.

Aninda Maulik

Mohamadnour Badr

Morad Benkaraache

Dharmalingam Dhayananth

Abstract

Projects play key roles in most modern industries and firms. The management of these economic activities, project management, is continuously developed and today considered to be at the center of competitive advantage. Much classic research on project management has, however, focused on the planning and scheduling activities of project management. Traditional writings within the area even seem to treat project management as a discipline of planning or an application of systems analysis. Based on the empirical observations, we elaborate on a framework for the analysis of project management work where two perspectives are put at the fore; knowledge perspective and time perspective. From these perspectives, we discuss different roles that project management has in a product development context.

We have been demonstrated Scrum project management methodology in ITCPS2 Workshop2 for the purpose of managing the project. All the properties and approaches of Scrum methodology has been followed and documented here. In this report we explain detail information about our project and the deliverables of the project according to the scrum methodology.

Table of Contents

Table of Contents

Introduction

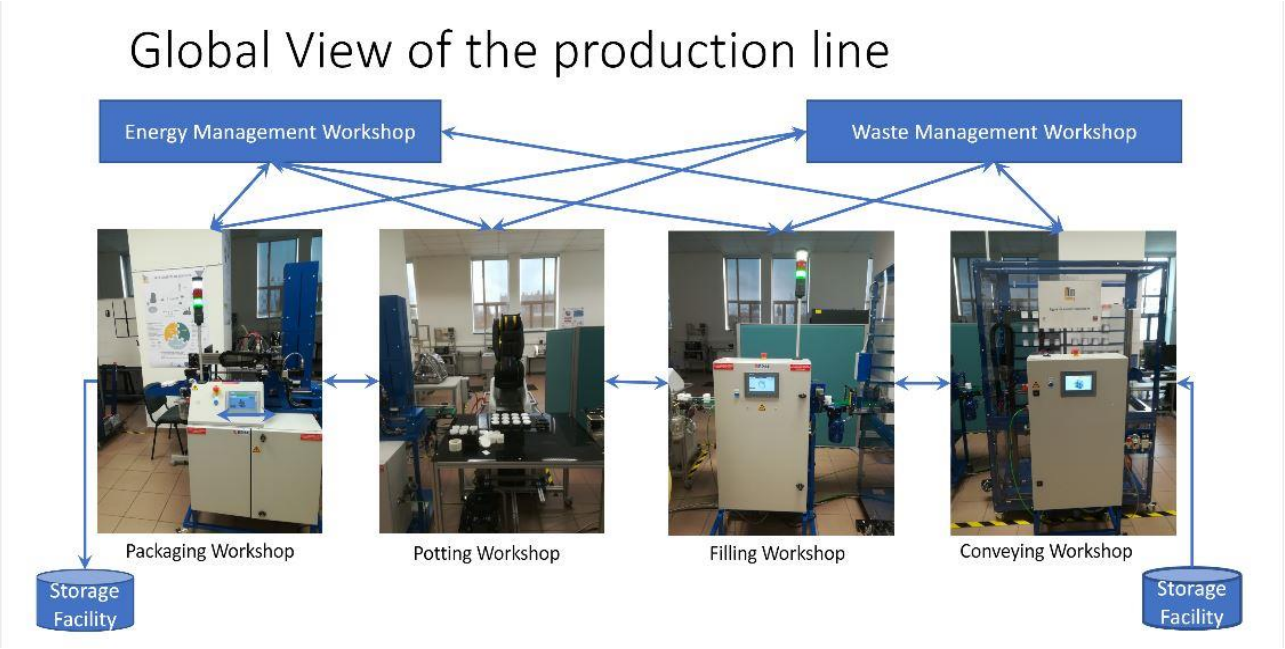

Figure 1: Global Use case

Production workshop is comprised of four different workshops which are Conveying Workshop, Filling Workshop, Potting Workshop and Packaging Workshop. Also, it connected to two other supporting service workshops, which are waste transformation and energy production system.

Conveying workshop collects empty contains from storage and send it to the filling workshop. Filling workshop fills the empty containers with material and it to the potting workshop. Potting workshop will close the containers and send to the packaging workshop. Packaging workshop will package the containers in to boxes.

Each workshop consumes energy and produces waste. These part will managed by supporting services which are energy and waste management service.

This flow will done automatically and continuously one after the other. The conveying workshop will continuously picks containers one after the other and keep send it to the next workshop and so on.

Our goal is to simulate the same process with our application by developing API application and make interconnection between them.

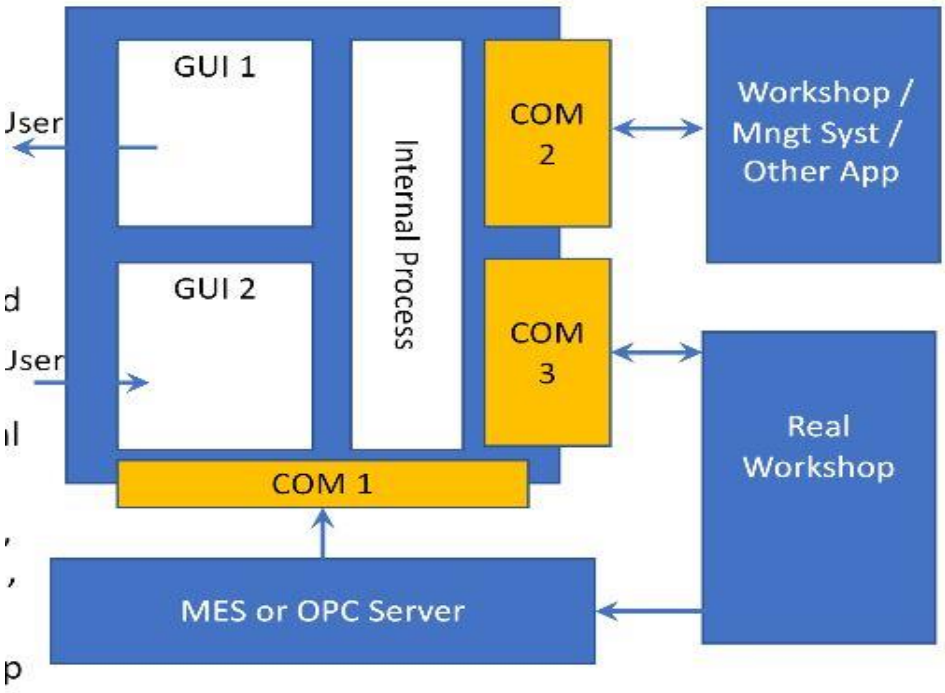

Figure 2: Architecture of the workshop

- GUI1 will be used in order to visualize the parameter that has been delivered by each workshop. Each workshop will use this interface to display the status of the application and to display inter function process with different output parameters. Ex: information sent to other workshop, information received from other workshop
- GUI2 will be used to perform user interaction to the internal function of each workshop. Allows to send values to the internal process and to perform some function.
- Internal process is the simulation of process that is corresponding to the workshop. •It will process some function and output new parameter values.
- COM1 is communication interface with the MES or OPC server that gather data (parameter values) from the real workshops.
- COM2: communication interface with other workshops, the management systems (energy, waste management), other App. COM2 is a Web API.
- COM3: communication interface with the real workshop

Our Stack

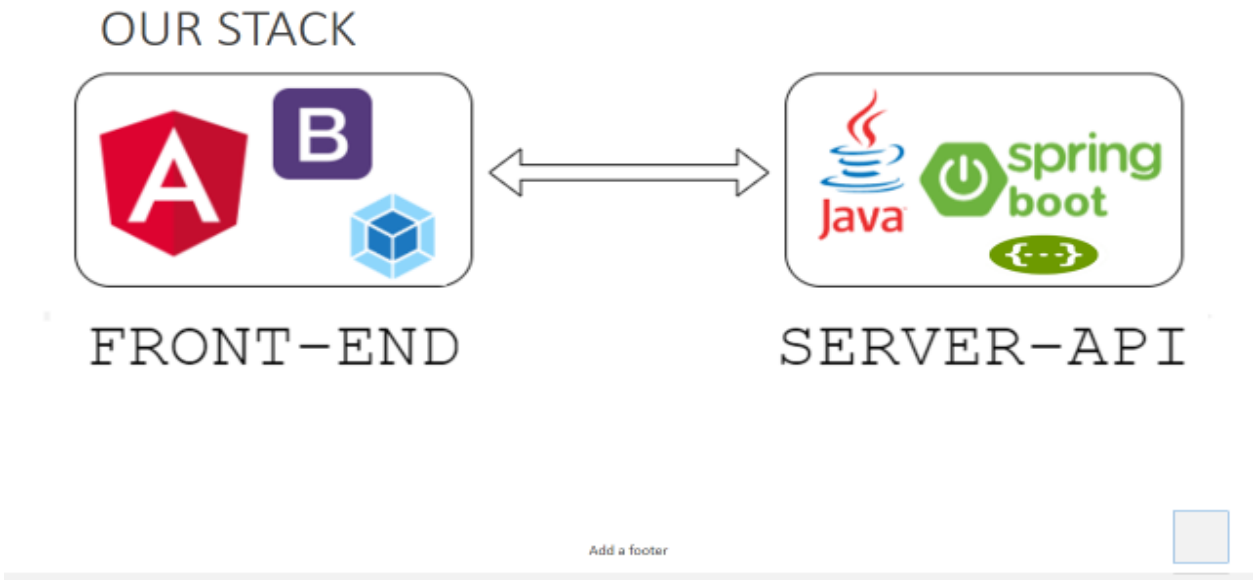

Figure 3: Stack of the application

Front End Technologies

- Angular 8
  - We are using Angular framework to develop our client side web interface. This framework fully support TypeScript.
- Bootstrap
  - Also we use Bootstrap for design our interface with good looking components.
- Webpack
  - Finally we use webpack to bundle our JavaScript application. This tool will do the job of "uglifying" of "minifying" process.

Server API Stack

- Java – Spring Boot
  - We use Spring boot for developing server application with Rest API. This is a framework that developed using Java programming language.
  - We use Swagger for API Documentation.

Sprint Duration

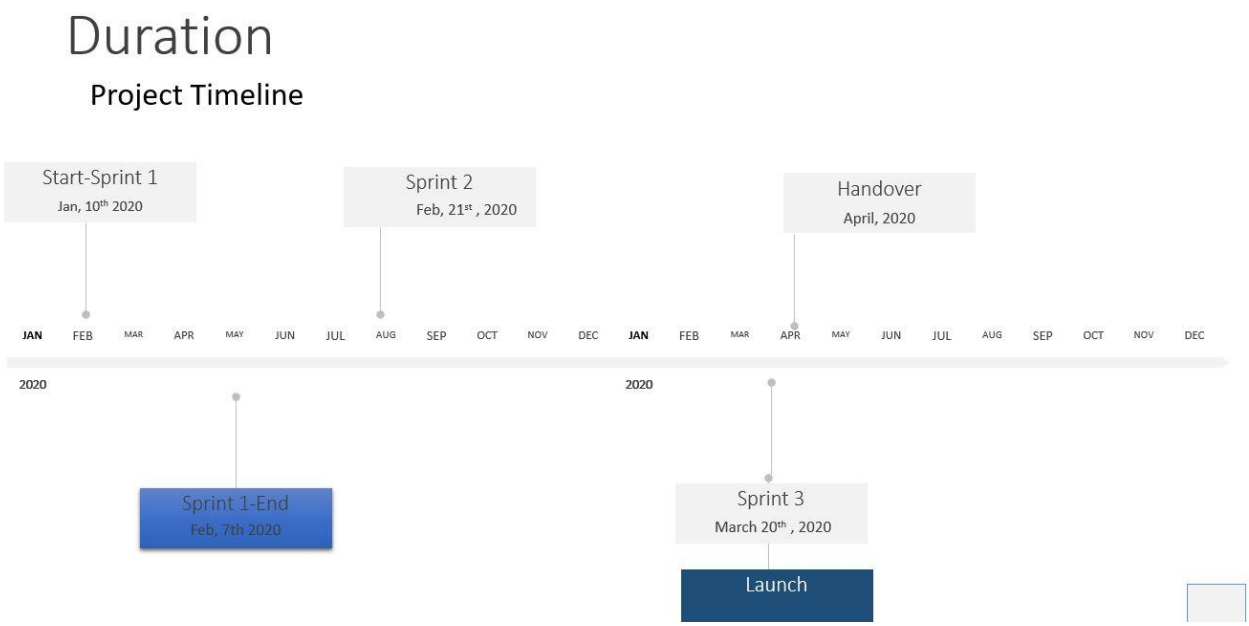

Figure 4: Spring Duration

We had three sprint for this project as above diagram. Each sprint duration were explained in the timeline. Final launch of the workshop has been done on 20th of March.

Repository

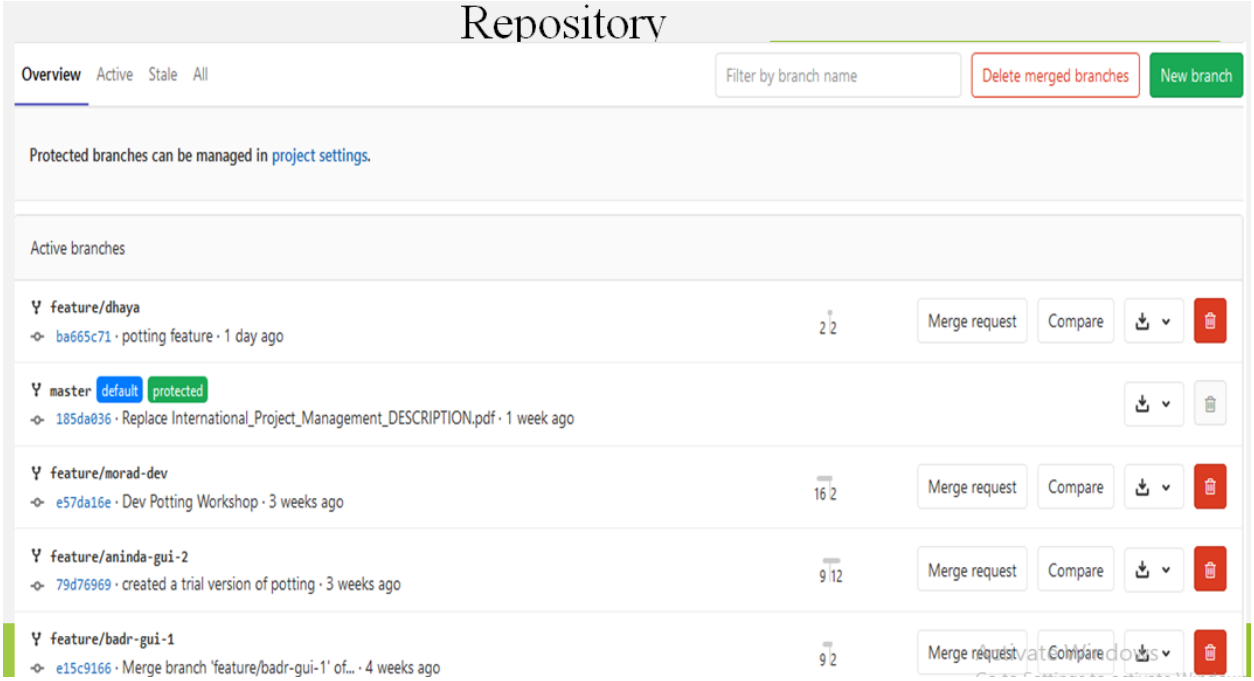

Figure 5: Repositories

Above image shows our different repositories that has been created in Hitlab based on our team composition and workload. All the branches have been updated and merged at last. Some merges were done using Git Rebase where pull request is not eligible in this case. Some merges were done using pull request. However, all the commits flow has been updated in master branch with final merge. So, it is possible to see complete commit flow of different branches in master branch. Below image shows the commit flow of master branch.

Commits Flow

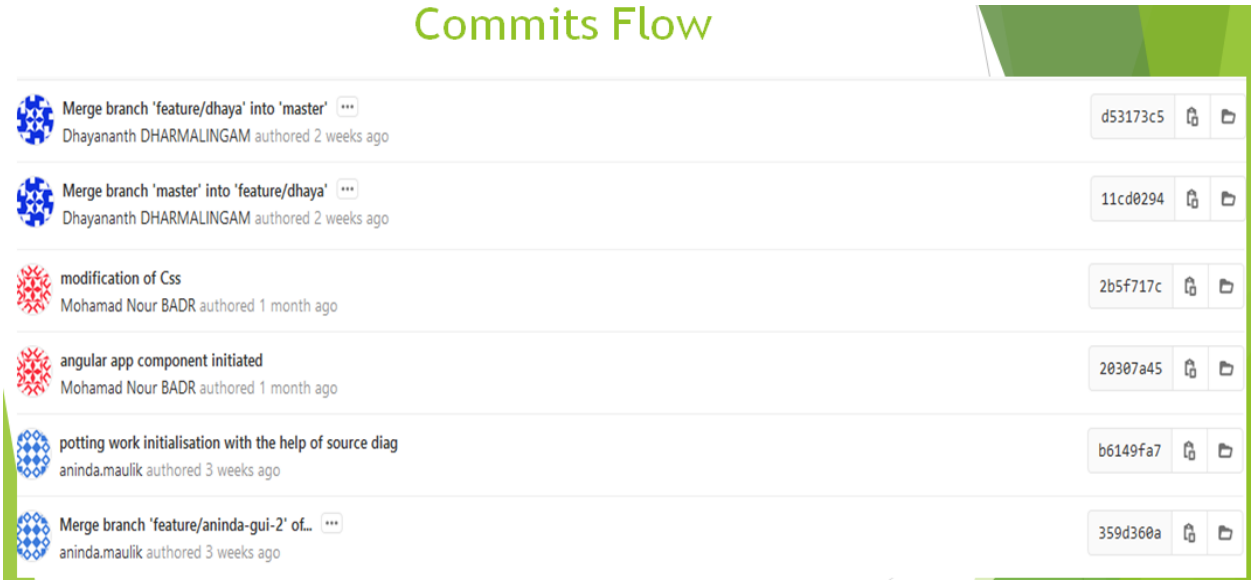

Figure 6: Commit flow

Gitlab Board

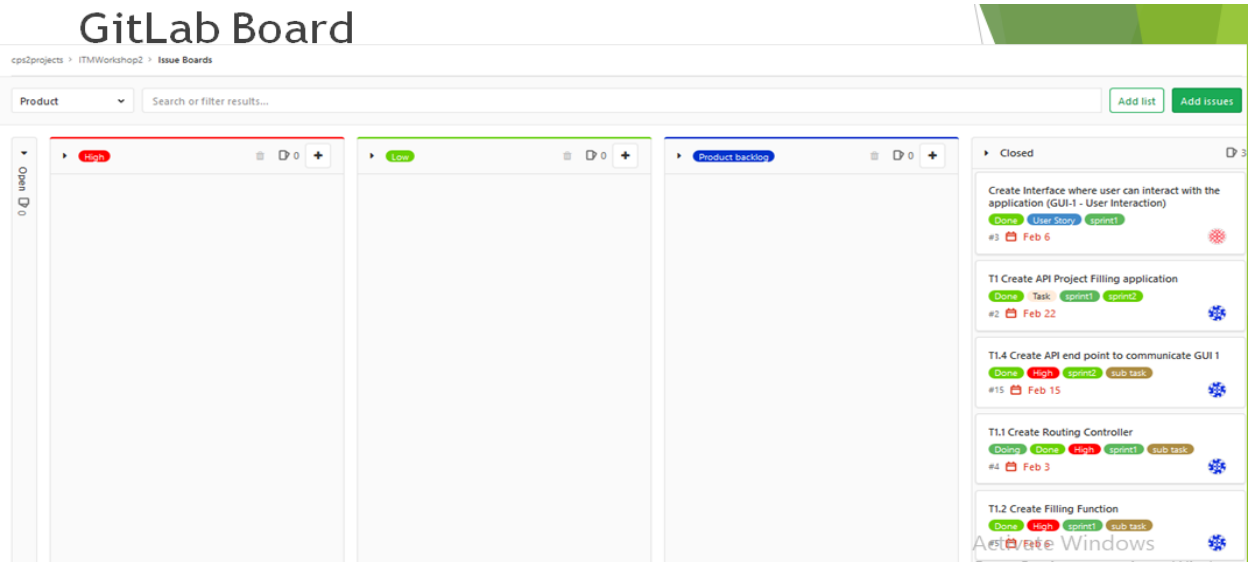

Figure 7: Gitlab board management

We managed different boards in gitlab for get better overview of current status of the development. We created “High”, “In Progress”, “To Do”, “Product Backlog” and “Closed” boards for better visualization

Gitlab Closed Issues

Figure 8: Closed issues

As above image shows, we have closed all the opened issues with progress and we were successfully able to complete this project as expected. Even though we have some overdue task that passed the deadline, we were able to finish it with next sprint by increasing our effort on this project (By allocating some more time than planned – Explained below in burndown chart).

Milestone Comparison

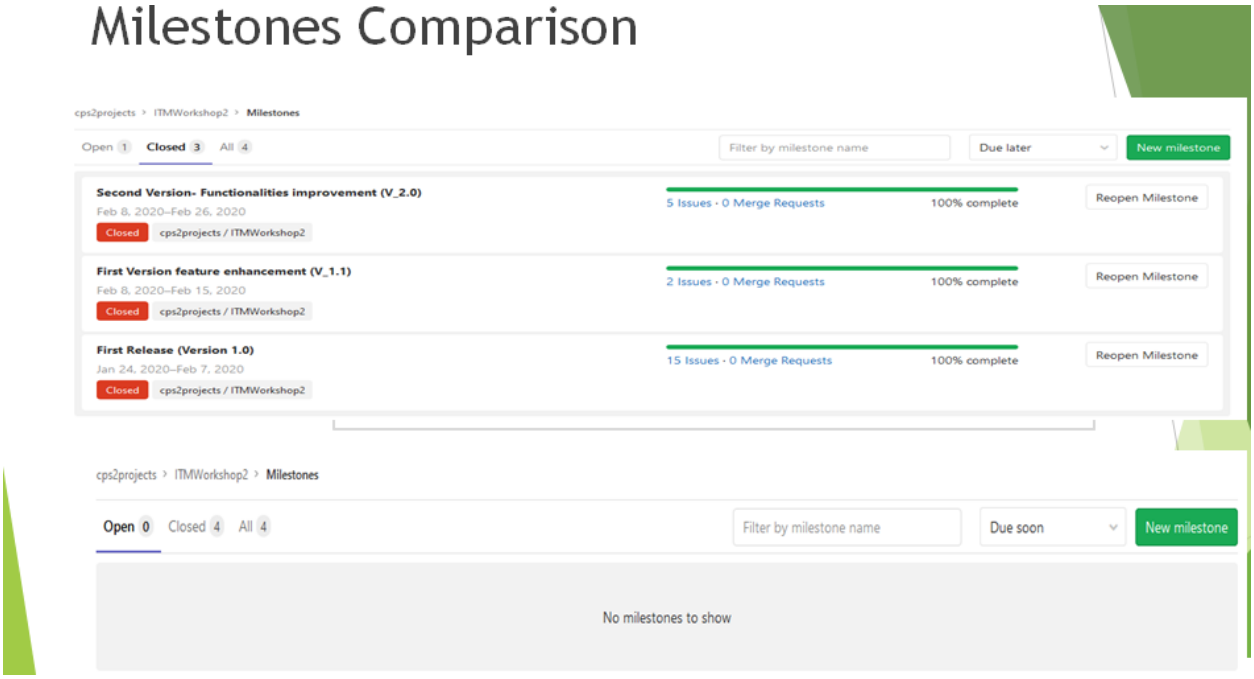

Figure 9: Milestones

We created different milestones based on different phases of the application and sprint date. We successfully closed all milestones and we closed all corresponding issues of each milestone. Milestone was help us to keep track of our short term goals in this project.

Difficulties That We Faced

Problem #1: Organisational structure

During the given parameter check, we found that the parameter were written in French and after translating them, we were not able to match that with our own variables.

- Removed the additional parameters which wasn't in sync with our variables, after having a discussion with our Product Owners.

We realized that the focus should be more on communication between GUIs and other teams.

Problem #2: Organisational culture

The two GUIs were taken up by two different individuals from our team. During our 1st Sprint, we found that though our methodologies were the same but our implementation ideas were different.

- We overcame that over our 2nd sprint and the way we did this was by putting across a design plan before implementation.

Problem #3: Communication

We, generally executed our design plans in class when all the group members were present. But due to the recent crisis, we failed to do so.

- However, we were able to overcome this by prioritizing the subject. We, all sat together over a video conference which took place for hours together until we were able to put in place the right design plans.

Problem #4: Technology

Every other group were implementing their internal process over Python, hence we tried to do the same along with Java. We were confident that these two different programming languages would sync successfully.

- One of our team member took a few days while trying to integrate to an API using a Python. Our Scrum Master was able to spot the limitation of various factors. We finally were able to complete the two internal processes with Java in due course of time.

Problem #5: Experience

Our group comprises of experienced and non-experienced people in terms of work-experience.

- This was a really big challenge to overcome, as experience is not a process or mindset that can be quickly altered to produce better results. By encouraging continuous learning, our Scrum Master demonstrated that he is interested in the individual's personal growth. This was further facilitated by our Scrum Master by giving KT and he also offered his own credentials of online learning platforms, which our team-members made good use of.

Problem #6: Over-engineering

Situation of over-engineering came up and the result was that one of our developers were not understanding what was required from the Product Backlog item.

- The individual did consult the Scrum Master, and he took the problem to the Product Owners in due course of time.

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Burndown Chart

Burn down chart

Week	Burned down Planned	Burned down Actual	Balance Planned	Balance Actual	Daily Completed
0			139	139	#N/A
1	20	19	119	120	19
2	18	17	101	103	17
3	18	12	83	91	12
4	16	14	67	77	14
5	15	7	52	70	7
6	18	13	34	57	13
7	8	18	26	39	18
8	9	26	17	13	26
9	8	6	2	7	6
10	7	5	2	2	5

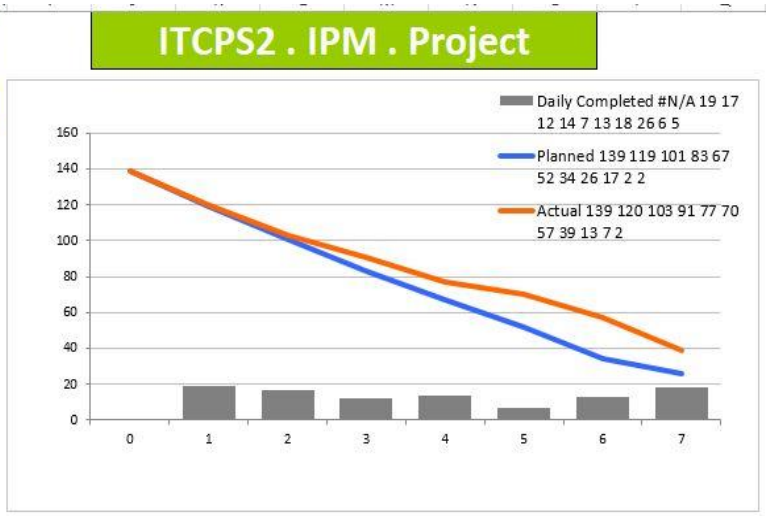

Figure 10: Burn down chart

According initiation plan of this project, we allocated 139 hours for this project. We worked as we planned and put our maximum effort to achieve the goal. We were not able to work as we planned in some weeks. But we were able to cover and manage the situation with some extra effect in next weeks of the projects. Ultimately, we achieved our goals and project deliverables as we planned. In above image, it shows we failed to work as we planned in third, fourth, fifth and sixth week of the project. But in next weeks (7 and 8) we worked some more time than we planned to fix the variation. Hence, we successfully achieved our goal.

Retrospective (Lesson learned)

We learned different skills and knowledge during this project. It was a great experience to all of us in a project that help us to learn different industrial good practice and most importantly team skills. We were listed below all the lessons that we learn through this project.

- Organization of the team
  - How to organize and assign different role to team members.
- Team Management
  - How to manage the team when there is different opinion and focus.
- Decision Making as a team
  - We faced different situation where every team members will have different opinion. But, with proper justification we were capable to make proper decisions which then accepted by all the members.
- Communication and discussion within the team
  - How to organize the meeting and how to present in the meeting which every team member would understand it.
- Influencing team
  - How to influent other team member on our opinion: Ex: Justification. We were able to make accept other team members with a proper justification explaining the advantage of the current decision. Then all the members were able to follow the path that has been justified.
- Resource planning
  - Plan and allocate resources for different task.
- Identifying difficulties of the task
  - Pre analyse the difficulties, prepare alternative plans for achieve goal.

- Leadership Skills
  - How to support to the team to achieve the goal as a team member. It is responsible of all the members of the team.
- Team Coordination
  - Coordinate the team to focus on exact goal. Not everyone having different opinion and assumption.
- Project change control
  - Pre-analyse and prepare in order to adapt any changes during the project.
- Resource over allocation management
  - Avoid over allocation in order to utilize resources in proper manner.
- Risk management
  - Analyse the possible risk, prepare possible alternative solutions, and create change control to adapt all alternative risk adaption plans.

Achievements

- Potting Application- COMPLETED
- User interaction form – COMPLETED
- Status Display –GUI- COMPLETED
- Status Display – Filling Application- COMPLETED
- Communication layer with other team- COMPLETED
- Power Consumption management module- COMPLETED
- Waste Management module-COMPLETED
- Power Management module-COMPLETED

Conclusion

We successfully completed this project by following Scrum methodology. We were able to completely manage the code and tasks of different team members by following SCRUM methodology and Gitlab tool. We learned all components of the SCRUM with this project and we understand the complexity of project management. Also, we learned how to manage a project with SCRUM methodology and how to work as a team. SCRUM is very useful in the field of project management. We were successfully achieved our goal of this project with the utilization of SCRUM methodology.