

# Team07 Meeting Minute

## SOFTWARE ENGINEERING GROUP PROJECT

**Supervisor:** RuiBin Bai

<b>Date</b>	2021-10-25	<b>Chairperson</b>	YANG Jiun-Chi
<b>Time</b>	15:05~16:05	<b>Secretary</b>	PARK So-Young
<b>Participant</b>	CHO, In Jae (20212687) FANG, Yichu (20214756) LAU, Yik Lun Yelan (20217531) PARK, So-Young (2021536) YANG, Jiun-Chi (20215187) WON, Minhyeon (20314810)	<b>Notes</b>	6 out of 6 participated Absent: x Late: x <i>Supervisor's request: next supervisor meeting will be in two weeks</i>

<b>Topic</b>	Requirement Specification
--------------	---------------------------

### Meeting Summary

Content	Issue/remarks
<b>1. Project background</b> <ul style="list-style-type: none"> <li>- Requirement of intelligent manufacture leads to need of multiple software:</li> <li>- (ERP) <i>Enterprise resource planning software</i>: High level planning. Help them to manage the major resources, HR, finance</li> <li>- (MES) <i>Manufacturing execution system</i>: allow to execute plan. <ul style="list-style-type: none"> <li>- Details about the manufacturing process are needed to create standardized process.</li> </ul> </li> <li>- Fixed number of resources in dynamic environment: without good estimation about orders, production cannot be planned.</li> <li>- Different quantity, urgency, and deadline: different price</li> <li>- (APS) <i>Advances planning and scheduling</i>: Core part. Allow to plan before production <ul style="list-style-type: none"> <li>- Ex&gt;Create timetable in Gantt chart: how much materials are required by what time, how many staffs need to be allocated, how is capacity of hardware</li> </ul> </li> <li>- Need software to tell how likely the company will be able to manufacture that <i>quantity</i> of the product within the <i>deadline</i> based on production capacity or given information of equipment, labors, materials, existing order, number of operations for each order, etc.</li> <li>- Examples of job scheduling software company: SAP,Asprova, IBM,Boasight.etc</li> <li>- Software use in Ningbo companies: <ul style="list-style-type: none"> <li>- Use math system but no apps: estimate based on data on excel spreadsheet</li> <li>- Use APS software but it's difficult: some attributes not so in use, bad visualization, too many assumptions that are not close to the real world</li> <li>- Challenges <ul style="list-style-type: none"> <li>- Insertion of the new order, and adjustment of the sequence of the order.</li> <li>- Adopting software to different industries</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>- The provided ppt for explanation is project bid with three million grants (not applicable with our project) Local company in the project brief is this project related two company with industrial software/hardware. <i>May</i> have chance to meet them (low)</li> <li>- For our project, assumptions should be made and compromised. Can't handle all the circumstances.</li> </ul>

## 2. Requirement

- Simplified version of the real-world production
  - Make people to deploy the software easier, and to customize.
  - Care about: simulation & algorithm part
    - Cloud system to submit the job and optimize remotely & actual deployment: x need to care
  - Interface that allows to populate the data into the algorithm
  - Nice visualization
    - Ex> Table: For each machine, how many jobs
    - Gantt chart: project planning, multiple job operation
  - Find websites that host the public dataset and use it. People can compare the algorithm with same dataset.
  - data level: create simulation library to allow to simulate the production process, how job is completed overtime
  - Parser: Compiler to handle to script (easy to use).
    - Go through compiler module quickly to understand the keywords, identifiers, the regular expression
    - Ex> similar mechanism with sys to decode the Mips code
  - Plan->math system for execution
  - Algorithm for optimization: operation to be completed within the deadline with the lowest cost
    - Could use OR-tool library
    - There is existing classic algorithm designed for job shop problem
  - Need to compute exactly when the order will be completed
  - Try to extend the public tools available if difficult
  - Handle emergency and change
  - Challenging as different company means different constraints and objectives. Multiple models have different configuration and different process.
- Understand project brief
  - Start with reading and understanding job shop scheduling problem defined from Wikipedia.
  - Search on the internet to see how to visualize the schedule in a 2D screen to make easy for users to understand
  - Google OR tools also have some dataset
  - consider that each job has multiple operation
  - Professor Rui could appoint to the right library if the team is having trouble
  - try to watch some videos and try to see the process of different models as well

## 3. Inquiries

- 1. Database
    - use public dataset available online (not random)
    - x involve human
  - Reinforcement learning: not a requirement but possible to include.
    - Could Use other method we will learn in AIM
    - Optimization algorithm is also AI related but x machine learning
  - 2. Ethics checklist:
    - x need further ethics permission
    - Not related to human being
    - No surveys included
  - 3. operating system:
    - Web based software
    - the environment doesn't matter, no need to work on different operation systems if there is a web
    - x need to create application on cellphone
  - 4. Programming language:
    - No restriction if requirements are fulfilled
    - Checked:
      - Frontend: ReactJS
      - Backend: Python & Flask
- Only consider human resources as the abstract resources  
Ex> resource type1 type2 type3
  - Professor can check the plan and the make suggestion next week

Task		
Content	Charged Person	Due Date

Officially set meeting in Microsoft Teams calendar	YANG Jiun-Chi	
Ethics checklist	all	2021-10-28
Plan(timeline done)	all	2021-11-08
<b>Next meeting</b>	PMB425, Monday, 2021-11-08 1:00~	