

ETBA2023 Lecture Diary (Oct 30, 2023)

1 General

1. Discussions on the questions in Assignment 1 and Assignment 2.
2. Update on the lecture note on *Evolution of Technology*: (i) On Section 1; (ii) On Section 4.5, voice assistant (revised) and generative AI (new).
3. A review on different stages of industrial revolution has been delivered in the lecture. The starting period of a stage of an industrial revolution is defined as the year marking a blooming influence of the corresponding technology in the industry. It is not the initial period of time the technology started to be researched and developed.
4. **[Class Exercise:]** What is the difference between a tool and a technology?

2 Principle Behind the Use of Technology

1. **[Principle:]** *Only if (i) you know how to solve a problem and (ii) you know the technical detail of a technology, you know which technology can be used.*
2. Only if you know how to solve a problem, you can justify if the problem has been solved and you can define the quality factors for the result.
3. Beware of the word 'know'. If you know how to cook, you can ready a dinner without the help or assistance from others including UBEREat and FoodPanda.
4. In accordance with the budget request process as shown in Figure 1, which problem(s) the team should know?
5. Note that selection of a technology to be used in an operation depends on the design of the operation and the design of an operation also depends on the usage of technologies, see Figure 2. Therefore, operation design is essentially a co-design process. The selection of technologies, the selection of human workers and the design of the operation are interdependent.
6. Figure 2 shows the three factors and their dependency among each other. The three-factor diagram together with the table depicted below and the operation design as shown in Figure 1 could let an operation designer (resp. a reviewer) to check if (i) there is anything missing, (ii) there is any task inefficient, (iii) there is possible modification in the design.

Here, it is assumed that an information system has been ready for the tasks except proposal preparation. The design on the information system depends on the actual tasks to be done by the workers. The user interface design for each task depends on the skill of the corresponding worker.

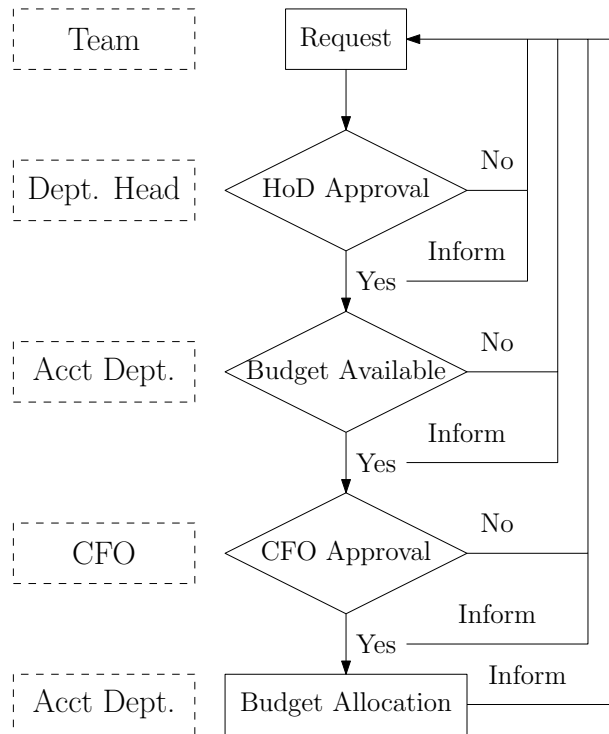


Figure 1: An operation design for project budget request. In each approval step, the corresponding staff has to inform the team the decision no matter the decision is positive or negative.

7. [Class Exercise:] With reference to Figure 1, which key performance indices (KPIs) should be defined? Note that a KPI is in essence a process quality.
8. [Class Exercise:] If the CFO is in a vacation for one month, is it possible to conduct the budget request process as shown in Figure 1?
9. [Class Exercise:] If all the computers in the firm were, is it possible to conduct the budget request process as shown in Figure 1? State those technologies to be used in the new process and the reasons why they are used.

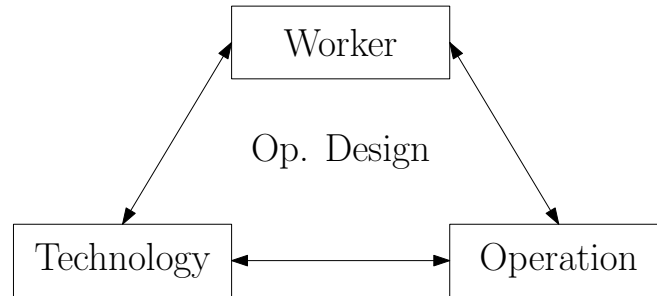
3 Generative AI Models

A generative AI model is a model which is able to generate content seemingly generated by a human. For instance, an LLM is able to generate a bunch of text seemingly generated by a human. Midjourney¹ is a platform which is able to generate an image based on the description entered by a human user. The image being generated is seemingly generated by a human painter.

1. Generative models: Factor analysis and structural equation model (SEM).
2. Generative AI: [generativeai.net](https://www.generativeai.net). It is a website introducing the common perception on generative AI.
3. Business applications of generative AI models and related tools.

¹<https://www.midjourney.com/>.

Operation design is co-design process.



Workers	Tasks to be done in the operation	Technologies
Team members	Proposal preparation.	MS Word
Team leader (TL)	Request submission.	I.S.
HoD	Request approval.	I.S.
HoD	Informing AS and TL the approval decision.	I.S.
Accounting staff (AS)	Checking budget availability.	I.S.
Accounting staff (AS)	Informing CFO and TL the budget availability.	I.S.
CFO	Request approval.	I.S.
CFO	Informing AS and TL the final decision.	I.S.
Accounting staff (AS)	Budget allocation.	I.S.
Accounting staff (AS)	Informing TL the budget allocated.	I.S.

Figure 2: Operation design is a co-design process. The above three-factor diagram together with the table depicted below and the operation design as shown in Figure 1 could let an operation designer (resp. a reviewer) to check if (i) there is anything missing, (ii) there is any task inefficient, (iii) there is possible modification in the design. Here, it is assumed that an information system has been ready for the tasks except proposal preparation. The design on the information system depends on the actual tasks to be done by the workers. The user interface design for each task depends on the skill of the corresponding worker.

- The business applications of LLMs.
- The business applications of Midjourney.
- The business applications of factor analysis.
- The business applications of SPSS and SAS.

4 About the Class Exercises

The class exercises are designed particular for examining your (logical and reasonable) imagination the problems raised. In essence, the exercises challenge if you are able to consider every detail on an operation design. Possible solutions (i.e. operation designs) for the exercises are many. There is no model answer for one of the class exercises. Any logical, reasonable or workable solution is acceptable.