

ITM2025 Lecture Diary March 7, 2025

1 Lecture Outlines

1. The TA of this course is *Ke-Sin*.
 - 1.1 She is from Thailand and now a master student in the Institute of Technology Management. I am her supervisor.
 - 1.2 As a student in my class, you are obligated to love her and protect her.
 - 1.3 Don't ask for her telephone number.
2. Create a LINE group for this course *ITM2025*. *Ke-Sin* is a member and I will not be.
3. On make-up classes.
 - 3.1 In this semester, February 28, 2025 (Week 2 Friday), April 4, 2025 (Week 7 Friday) and May 30, 2025 (Week 15 Friday) are public holidays. Therefore, we need three make-up classes for these holidays.
 - 3.2 Note that each student has to present his/her progress (resp. final) report in Week 9 (resp. Week 18). If the time for a presentation is 20 minutes, two classes each three hours long are expected. Thus, two make-up classes could be arranged in Week 9 and Week 18 for presentations. The third make-up class is arranged in any other week.
 - 3.3 Please discuss in the LINE group on which weekday evenings the make-up classes should best be scheduled.
4. The so-called AI tools (resp. systems) are indeed not that intelligence.
 - 4.1 Alpha GO can only play GO games. Chat GPT can only generate text in response to a prompt. Deep Research can only generate a research proposal. Except the dedicated function pre-designed, each of these AI systems can do nothing more.
 - 4.2 To facilitate the building of such AI systems, human plays an inevitable role – information generation. The information generated are used for training such systems. Without human-generated information, no AI system can be built.
5. Introducing the definition of *Intelligent Technology Management*, Section 6 in the document entitled *Introduction to Intelligent Technology*.
 - 5.1 Manage the usages of intelligent technologies for work.
 - 5.1.1 This task involves operation design. (Roughly speaking, operation, process, procedure, algorithm and work-flow are referred to the same thing. SOP (Standard Operation Procedure) is an operation design.)
 - 5.1.2 The decision on which technologies to be used is interdependent on the operation design, i.e.

Usage of technologies \Leftrightarrow Operation design for a work.

- 5.1.3 Operation re-design (aka business process re-engineering) might be required to better use of those technologies for work.
- 5.1.4 *Operation analysis and design* is the key in *operation management* and *quality management*. However, it has usually been skipped in many undergraduate and master management programs in Taiwan.
- 5.2 Manage the development of an intelligent technology for work and/or for sell¹.
 - 5.2.1 This task might involve a lot of imagination on a future work to be done and the corresponding operation design.
 - 5.2.2 If the new technology is used for work, operation re-design (aka business process re-engineering) might be needed.
- 5.3 Manage the access right of an intelligent technology. This task involves *intellectual property management* and *marketing*.
- 6. Owing to let you exercise operation design, the problems included in the next section 'A Taste of Operation Design' are prepared for you.
 - 6.1 Try to think of the solutions for solving such problems.
 - 6.2 If possible, write down the steps how for each solution.
 - 6.3 Note that this is not an assignment.
 - 6.4 My solutions on some of these problems will be introduced in the next lecture.
- 7. The context in *Intelligent Technology Management* is far more than introducing AI tools and their usages in work.
- 8. Introducing the definitions of *Intelligence* and *Artificial Intelligence*. (To be discussed in the next lecture.)
- 9. Questions listed on the course homepage *Outlines*, Topic 1 – *Introduction on Intelligent Technology*. (To be discussed in the next lecture.)

2 A Taste of Operation Design

Operation design is the design of a step-by-step procedure for solving a problem (resp. completion of a job). In the area of computer science, it is called *algorithm design*.

2.1 Abnormal Ball Problem

In the problems below, it is assumed that the rental cost of a pan balance is NTD10,000 for 1 second. To use the pan balance for the another second, you need to wait for one month. So, the cost and the time spent for solving below problems are additional concerns.

- (a) You are given a set of 9 balls. All of them look the same and sensed the same. Eight of them weight 2000 grams and one of them weights 1999 grams. Pan balance is the only tool for use. Describe in detail, step by step, how do you use the pan balance to find the lighter ball.
- (b) You are given a set of 9 balls. All of them look the same and sensed the same. Eight of them weight 2000 grams and one of them weights 2001 grams. Pan balance is the only tool for use. Describe in detail, step by step, how do you use the pan balance to find the heavier ball.

¹If a technology is developed for sell, we can call it a *technology product*.

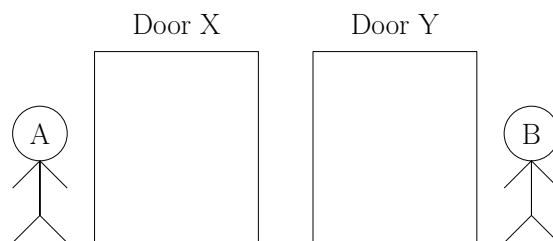


Figure 1: Two doors and two doormen.

- (c) You are given a set of 9 balls which are looked and sensed the same. Eight of them are 2000 grams. However, we do not know if the abnormal ball is lighter or heavier. Describe in detail, step by step, how do you use the pan balance to find the abnormal ball.
- (d) You are given a set of 9 balls which are looked and sensed the same. Seven of them are 2000 grams. Two balls are abnormal and we do not know if the abnormal balls are lighter or heavier. Describe in detail, step by step, how do you use the pan balance to find the abnormal balls.
- (e) You are given a set of N balls which are looked and sense the same. $(N - M)$ of them are 2000 grams. M balls are abnormal and we do not know if the abnormal balls are lighter or heavier. Describe in detail, step by step, how do you use the pan balance to find all M abnormal balls.

3 Heaven-and-Hell Problem

- (a) Imagine that you are now standing in front of two doors, say X and Y. One of them leads you to heaven and the other leads you to hell, see Figure 1. In each door, there is a doorman. Let the doorman standing in front of the door X is A and the doorman standing in front of the door Y is B. For the doormen, it is known that one of them always lies and the other always tells the truth. Besides, the doormen only answer 'Yes' or 'No' to you. Now, you can ask two questions. What will you ask?
- (b) Imagine that you are now standing in front of two doors, say X and Y. One of them leads you to heaven and the other leads you to hell, see Figure 1. In each door, there is a doorman. Let the doorman standing in front of the door X is A and the doorman standing in front of the door Y is B. For the doormen, it is known that one of them always lies and the other always tells the truth. Besides, the doormen only answer 'Yes' or 'No' to you. Now, you can only ask one doorman one question. What will you ask?