TIM 105/205, LECTURE # 11

- Product Dissection (Reverse Engineering) for Complex products
- Project Planning for complex projects (new product development)
- Road-map for the rest of the course
- Conceptual design for new products/services
- Return graded HW # 4
- HW # 5 (work for the coming week)
  - Product Dissection
  - HoQ for complex products
Product Dissection for complex products

[Examples: problems on HW #5, including laptops, MS Word, your product on the team project, cars, bicycles, robots...]

Step 1: First understand how the product works. There are many sources on the internet, including "howstuffworks.com"

Step 2: Make a list of the important subsystems & components that are relevant to your FAST diagram:

Example: System → Bicycle
Sub-systems: wheels, suspension, steering...
Component → cranks, spokes

Step 3: Make a list of the main function & key sub-functions of the product
Sub-function refers to the functions of the sub-systems
The function of the "transmission" system in a bicycle to "propel" the bicycle propels or propulsion is a sub-function of the bicycle.

**Step 4**: Write down the main or primary function for the system (product, service, ...) at the right-end of the FAST diagram.

**Step 5**: Organize the FAST diagram with the "WHYs" to the right and the "HOWs" to the left.

**Step 6**: Creating a FAST diagram (key-step) for a complex product requires "trial & error".

To minimize the trial & error work from both ends of the diagram (using the results of Steps 2 & 3).
Remark:
Before creating the HOQ for a complex products, you need to reverse engineer (dissect) create a FAST diagram) a set of related products.
PROJECT PLANNING for complex projects.

(New product development)

Context: Managing Product Development projects

This week's TIM 101 presentation: Project Management Methods/Implementation at Cisco

Next week's TIM 101 presentation: PM at Seagate

(Thimann Aud 4, Thurs, 4PM - 5:30PM)

Process for Project planning

1. Clearly state the intent of the project example: Project to design and develop a high-speed printer

2. Determine the design/development sub-tasks and activities

\[ \text{A: design the print-head} \]
\[ \text{B: design the drive electronics} \]
\[ \text{C:} \]

\[ \vdots \]
3. Create a design/development activity matrix

Reason: to understand the dependencies between the tasks

Convention

- \( \lor \) \( \implies \) "depends on"

- \( B \lor A \) \( \implies \) Sub-task B depends on subtask A

\[
\begin{array}{cccccccc}
A & B & C & D & E & F & G \\
A & & & & & & & \\
B & & & & & & & \\
C & & & & & & & \\
D & & & & & & & \\
E & & & & & & & \\
F & & & & & & & \\
G & & & & & & & \\
\end{array}
\]

- \( A, B, C \) are sequential sub-tasks
- \( D \) & \( E \) are coupled tasks
- \( F \) & \( G \) are independent tasks and therefore, could be done in parallel.
4. Create a schedule of tasks using a Gantt chart

Tasks/activities

A B C D E F G

The Gantt chart shows:
1. start and finish dates of each sub-task/activity
2. duration of each task
3. progress made on each task at any given point in time (indicated by "shading")

5. Identify the "critical path" for the project using a PERT chart
   Program Evaluation Review Technique
Identify the critical path:

A → B → C → E → F → ... 

Comment: Task D has a "slack" of 1 week.

6. Assign clear roles & responsibilities & keep track of progress

Practical advice (requirement)

1. Incorporate the above project planning process into your NYU 105/205 team project for all 10 weeks of this quarter.

2. Read the chapter on "Managing Projects" in the text, U&E, "PD&D"
Road-Map for the rest of the course:

The story so far

"Front end" 1. Strategy (CS, TS, PM/S)

"Middle" 2. Developmental goals (including Business Goals)

3. Aggregate Project Plan (Use Decision Analysis to select project mix to maximize value & minimize risk)

"Back-end" New product development

- HQ
- Reverse Engineering
- Project Management

- Conceptual Design
- Prototyping & Testing
- Product platform/architecture
- Economic/Financial analysis of new product development