# 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 } for complex products
  - HOQ

<u>Product Dissection for complex</u>
<u>products</u>

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

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

<u>Step 2</u> : Make a list of the important
subsystems & components that
are <u>relevant to your FAST</u>
diagram.
<u>Example</u> :  System —> Bicycle
sub-systems: wheels, suspension,
steering, ....
component —> cranks,
spokes

<u>Step 3</u> : 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

propel or propulsion is a sub-function of the bi-cycle.

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)

→

HOW ←                    FAST diagram          → WHY

┌─────────────────────────────────────────────────────────┐
│  ┌─────────────┐                              ┌────────┐ │
│  │ Sub-system 1 │                             │ Main   │ │
│  └─────────────┘                              │  or    │ │
│                          ⬭                    │Primary │ │
│  ┌─────────────┐    →      ←                  │function│ │
│  │ Sub-system 2 │        work                 └────────┘ │
│  └─────────────┘        from                             │
│       ·                 both ends                        │
│       ·                                                  │
│  ┌─────────────┐                                         │
│  │ Component 6  │                                        │
│  └─────────────┘                                         │
└─────────────────────────────────────────────────────────┘

from
step 2

Using the
sub-function
information from step 1
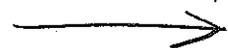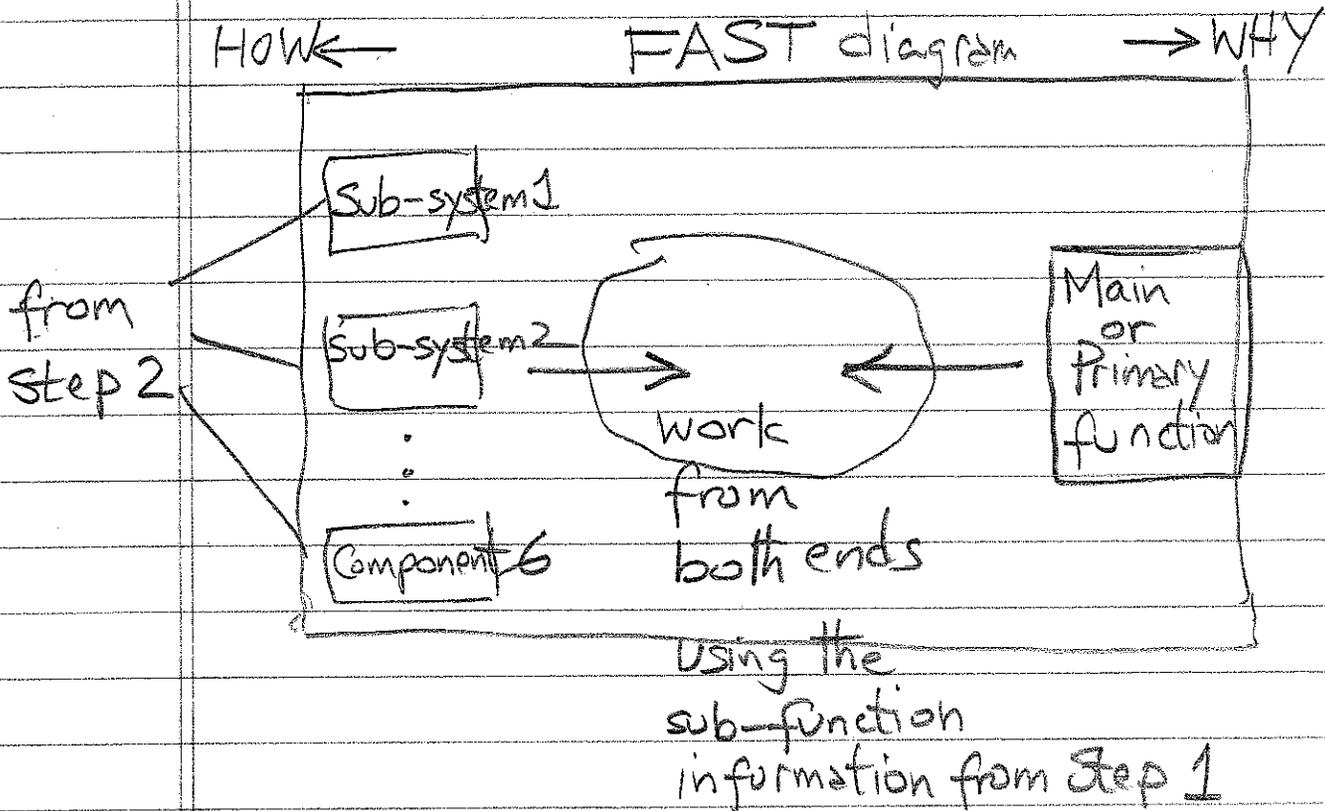
Remark:

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 1, Thurs, 4PM - 5:30PM )

Process for Project planning

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

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

Sub-tasks 
{
A: design the print-head
B: design the drive electronics
C:
:
}

## 3. Create a design/development activity matrix

Reason: to understand the dependencies between the tasks

Convention

$x : \implies$ "depends on"

$B \times A \implies$ sub-task B depends on subtask A



(i) A, B, C are sequential sub-tasks

(ii) D & E are coupled tasks

(iii) 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

present

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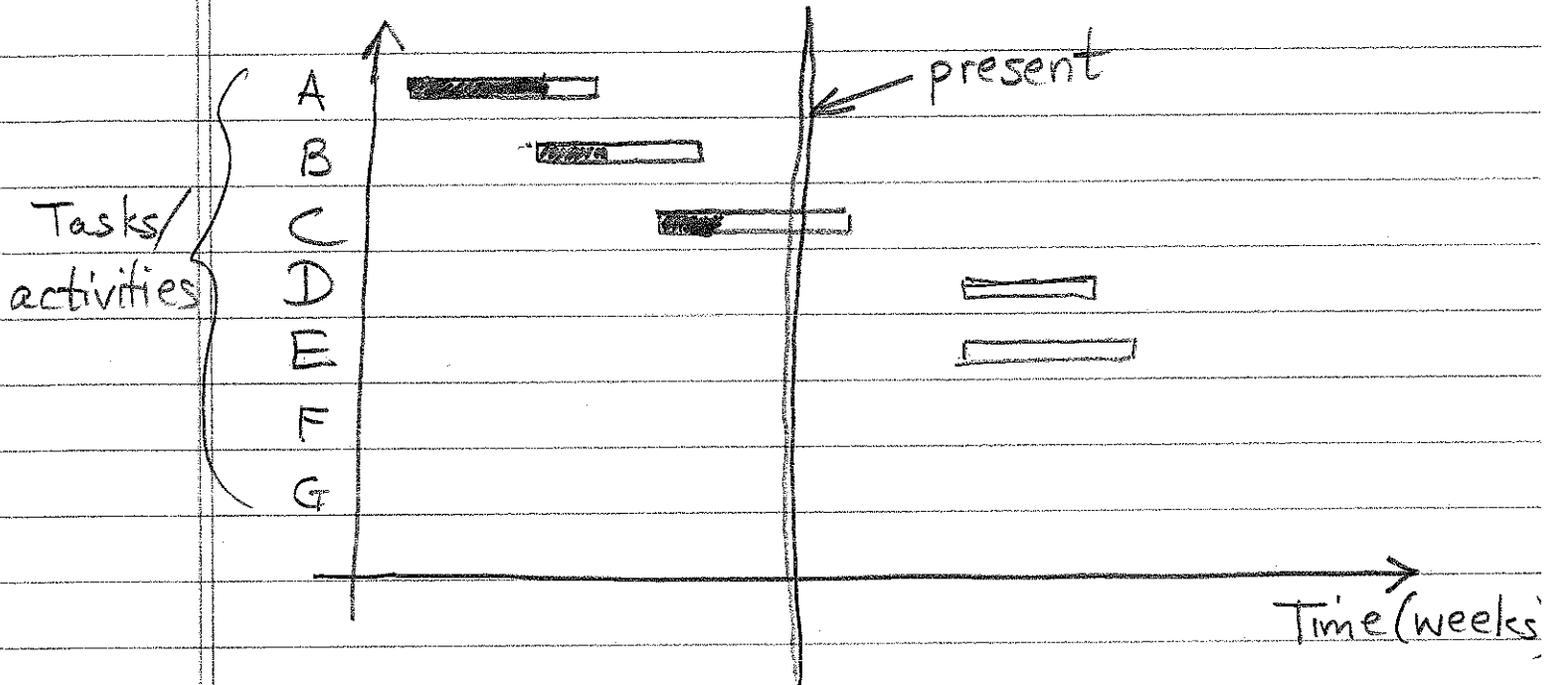
The GANTT chart shows
1. start and finish dates of each sub-task/
   activity
2. duration of each task
3. progress made on each task at
   any given point in time (indicated by
   "shading")

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

sub-task     duration
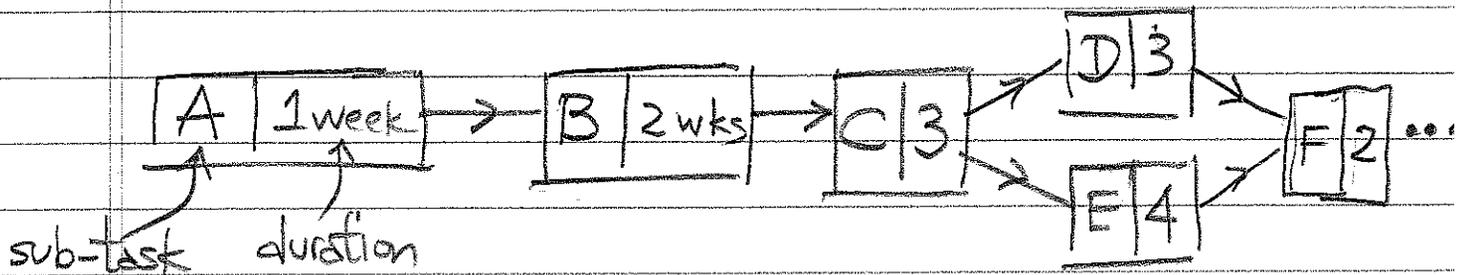
(from steps 3 & 4)

Identify the critical path:

$$A \rightarrow B \rightarrow C \rightarrow E \rightarrow F \rightarrow \cdots$$

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 TIM 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)

2. Developmental goals (including Business Goals

"Middle" {

3. Aggregate Project Plan (Risk Analysis)

(Use Decision Analysis to select project mix to maximize value & minimize Risk

"Back-end" {

New product development
- HOQ
↑PAST
- Reverse Engineering
- Project Management

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