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TIM 105

HW7

1. R&D and Product Management at Microsoft (continued from the midterm).
Go the course TIM105 website
(https://tim105-fall17-01.courses.soe.ucsc.edu/handouts/handouts-hw7) and locate the
following three TIM101 Microsoft presentations:

i)	**Dr. Roy Levin**	*"Managing Innovation at Silicon Valley"*
ii)	**Debbie Janes**	*"Goal Alignment at Microsoft"*
iii)	**Jeffrey Murray**	*"Microsoft Office: Delivering World Class Software"*

For each presentation, extract at least three key lessons which are relevant to (1) topics
covered in TIM 105, and (2) your analysis of Microsoft in Problem 1 of the midterm exam.
Present your results in the form of a suitable table (of your own design!).

Step 1: Define the real problem.
      SP1: Read the three presentations.
      SP2: For each presentation extract at least three key lessons are relevant to topics
covered in TIM 105 and my analysis of Microsoft in Problem 1 of the midterm exam.
Step 2: Plan to solve the problem.
      Assumptions: I am a student learning about .
Step 3: Execute the plan.

Presentation	Lessons
Dr. Roy Levin: Managing Innovation at Silicon Valley	Relevant to TIM 105: 1. Whenever research is performed there is a technology risk, i.e. the chance that the research will fail. There was a risk that the research being done at MSR, especially the long term research, would fail, i.e. it carried a technology risk. 2. There is also a product/market risk, i.e. the chance the product created from new technology will not perform well in the market. There is a decent chance the technology developed will not be transferred into actual products/services and a chance those products/services will not be successful in the market. 3. In a big company there are different areas of research. Some of the research is designed to help the company in the short term, and some of it is designed to help in the long term. Relevant to midterm:

	1. Windows was developed as a research project with the idea of developing a GUI to go with Windows in hopes of simplifying the user experience. 2. Research projects can net massive profits, but they are extremely infrequent. Windows didn't net MS a profit until Windows 3 in 1990, and many other research projects performed throughout the 80's and early 90's never netted any profit. 3. MS poured money into products/services focusing on the internet in the early to mid 90's. Levin highlighted this as one of the areas MSR focused on during his time there.
Debbie Janes: Goal Alignment at Microsoft	Relevant to TIM 105: 1. It is important to align individual tasks with the company goals so that the company will succeed if most tasks are completed. 2. Each goal needs to have specific quantifiable targets that can be monitored throughout the duration of the project. 3. Objectives can be for individuals, groups, or cross-company. Relevant to midterm: 1. MS spent large sums on PC's and Communications, and less on phones, TV's and enterprise infrastructure towards the end of the period the midterm case study discussed. This holds true in Janes' presentation. 2. Microsoft set commitments to guide employee behavior and ensure the company's goals would be met if employees were able to complete the majority of assigned tasks. 3. MS gave each commitment quantifiable targets so they could monitor employee progress throughout the development cycle.
Jeffrey Murray: Microsoft Office: Delivering World Class Software	Relevant to TIM 105: 1. Product ideas are developed as a cycle. 1st a short spec, similar to the product mission statement we learned about in class. The product idea is then developed by adding features based on similar products in the market, and ultimately the spec will represent all the features and functions the product will perform, similar to the process of using a FAST Diagram, HOQ, and FS diagram we used to do this in class. 2. Each feature specification has goals, design specifics, and details about what the feature should do. This is similar to what we do in a HOQ when we determine the customer needs and technical specs of the product/feature we are developing. 3. The schedule for product development includes a planning phase, coding (development) phase, testing phase, and a ramp up phase when the product is in final production and then released to the market. Relevant to midterm: 1. Microsoft typically releases a new version of a product every three years. 2. Microsoft was beginning to develop versions of their apps for the cloud towards the end of the case study we read for the midterm. They are continuing to do so as MS Office will allow users to store data on the

	cloud in the future. 3. Customer feedback is instrumental to MS producing quality products that will perform well in the market, and influences all aspects of product development.

Step 4: Check Your Work.

      I am confident that my work is correct.

Step 5: Learn and Generalize.

      Product development lessons learned by Microsoft are relevant to the material covered in this course. In general, continually learning is good and will help me become a better engineer and manager in the future.

2. Agile Project Management at Cisco and Seagate.

Go the course TIM105 website (https://tim105-fall17-01.courses.soe.ucsc.edu/handouts/handouts-hw7) and locate the following TIM101 presentations:

i)	**Ben Rus**	*"Project Management at Cisco"*
ii)	**Kevin Mann**	*"An Agile Approach for Implementing Enterprise Software"*

Then answer the following questions (your answers must be presented in a properly designed/structured table):

      What are the two main project management methodologies used at Cisco? Briefly describe each methodology, including the pros and cons for each. Also, indicate the type of projects for which each method is best suited.

      What kind of agile development methodology is used at Seagate? How is it different than the traditional Waterfall project development methodology? What are the advantages of an agile development methodology?

      Compare and contrast the agile development methodology used at Cisco to the agile development methodology used at Seagate.

      Relate the agile development methodologies used at Cisco and Seagate to the project management and prototyping methods discussed in class and in the U&E text.

Step 1: Define the real problem.

      SP1: What are the two main project management methodologies used at Cisco? List the pros and cons, and what type of projects each method is best suited for.

      SP2: What kind of agile development methodology is used at Seagate? How is it different than the traditional Waterfall project development methodology? What are the advantages of an agile development methodology?

      SP3: Compare and contrast the agile development methodology used at Cisco to the agile development methodology used at Seagate.

SP4: Relate the agile development methodologies used at Cisco and Seagate to the project management and prototyping methods discussed in class and in the U&E text.

Step 2: Plan how to solve the problem.
Assumptions: I am a student learning about different project management methodologies used at big companies. I am doing this for myself because I want to become a better project manager.
Available Information: The case studies on the course website, the PD&D book, and my lecture notes.
SP1: 2 main project methodologies used at Cisco.
Step 1: Read the Cisco case study.
Step 2: Identify the two project methodologies used at Cisco.
Step 3: What are the pros and cons of each method.
Step 4: What type of projects is each method best suited for.
SP2: Agile product dev at Seagate.
Step 1: Read the Seagate case study.
Step 2: What agile dev method is used at Seagate.
Step 3: How is it different than the Waterfall method.
Step 4: Identify the advantages of an agile development methodology.
SP3: Compare the methods used at each company.
Step 1: Compare and contrast the methods used at each company.
SP4: Relate the methods used at the companies to the methods discussed in class.
Step 1: What project management methods have we discussed in class.
Step 2: How do they relate to the methods used at the two companies.

Step 3: Execute the plan.
SP1: 2 main project methodologies used at Cisco.
-- the 2 methods are waterfall and agile

Method	Waterfall	Agile
Pros	- variable resources and time - team can go further with dev than using agile method	- capable of delivering product increments at set intervals of time - eliminates waste - frequent feedback - embraces change - enables competitive advantage
Cons	- any delays directly impact the project schedule - concept through development phases can take years - minimal feedback loops - change is disruptive	- requires companies to change the way they develop products - fixed time and resources for each project, which restricts what the team can do

	- slow learning	
Type of projects each method is best suited for	- projects with well defined goals because the waterfall method will allow the team to spend more time and resources meeting these goals without the issues caused by having to go back and change parts of the product if the dev goals change	- projects without well defined goals - the agile method allows the team to respond to changes of the dev goals well, and ensures that the major parts of the project will be finished for the product owner on time

SP2: Agile product dev at Seagate.

Type of Agile Methodology used at Seagate	Differences from traditional Waterfall Methodology	Advantages of an Agile Methodology
Scrum: an agile process that allows us to focus on delivering the highest business value in the shortest time.	- Instead of defining project features first and setting the cost and schedule estimates based on those, we set the cost and schedule of the project and work to create the best product within those constraints. - Waterfall is plan driven, Agile Scrum is value/vision driven. - Waterfall is sequential, Scrum is done in cycles.	- Ensures the project will be released on time and within budget. - Allows customers to get new products/features on time. - Teams get to manage the best way to produce and deliver software.

SP3: Compare the methods used at each company.

Similarities between methods at Seagate and Cisco	Differences between methods at Seagate and Cisco
- 2 week sprints - Team self manages the project - All the other basics of agile, i.e. cross functional teams, set budgets and schedules	- Seagate assigned point weights to each task to be performed and assigned tasks based on how many of the tasks could be performed - Seagate Kept sprint burndown chart to track how team was progressing - Seagate had Automated tests and built the project every day - Seagate documented requirements and test plans

	- Essentially Seagate added in the above features on top of the basic agile process used at both companies

SP4: Relate the methods used at the companies to the methods discussed in class.

Methods discussed in class	Similarities/Differences to Agile	Similarities/Differences to Waterfall
GANTT	- Sequential while agile is cyclical - Almost entirely different from Agile method - Set time schedule is similar to Agile method	- Sequential - Shows what tasks have to be completed before moving to new tasks - Extremely similar to Waterfall method
PERT	- Somewhat sequential unlike agile - Certain tasks can be performed together which is closer to the agile method	- Somewhat sequential which is like the Waterfall method - No set time schedule which is similar to Waterfall method

Step 4: Check Your Work.
    I am confident that my work is correct.
Step 5: Learn and Generalize.
    Each project development method has pros and cons. The waterfall method works better for projects with set development goals, but the need for an extraordinary product that will require more time and resources to develop. The agile method works better for products that don't have set goals when started, but do have a set timeframe and budget for completion. It ensures that the team will get something finished by the release date, even if all the functionality is not included.

3. Project Planning for Your Company's Proposed New Product.
    Proceed as follows:
Schedule a time to meet for the purpose of creating a detailed project plan for your company's proposed new product.
(before the group meeting) Assess the current state of the work done by the group and identify any backlog (e.g., conceptual design) from the previous stages. Bring your assessment to the group meeting.
Conduct a group meeting (2-3 hours) to develop (in a time-efficient manner) a comprehensive project plan (Activities Matrix, GANTT, PERT, CPM for the remaining weeks of your project. The major remaining activities are: product platform/line strategy, economic/financial analysis, and failure modes and effects analysis. In addition, you may choose to include some supporting

"pieces" such as a prototyping strategy, and integration. Your plan should also include any backlog (e.g., conceptual design) from Phase II. Lastly, assign roles and responsibilities to each group member for completing all of the tasks in the project plan.

Turn in a concise, well-written "problem solution" documenting all the work done and by whom. This solution should include your problem-solving process and clearly show its implementation. Note: to get credit every member of the group must participate in the group meeting, and must turn in a solution.

Project Planning for Your Company's Proposed New Product (Group 9)

Define: Create a comprehensive project plan for the remaining weeks of your project.

Plan:
- Meet with Group on Monday to discuss Project Plan for Phase 3
- Create Activities Matrix
- Create GANTT
- Create PERT
- Create CPM
- Add phase 3 project plan into phase 2 project plan

Execute:

Roles for Phase 3 (flexible):

Product Platform Line and Strategy: Vinshaan Nguyen, Dan Vo

Economic and Financial Analysis : Austin Winsherop, Kaitlyn Martinez, Kevin Chen

Failure Mode and Effects Analysis: Manzanita Griffin, Diego Garcia, Ethan Cox

Establish Design/Development Subtasks and Activities for Activity Matrix:

Phase 2:
  A. Aggregate Project Plan
  B. Reverse Engineering
  C. House of Quality
  D. Conceptual Design

Phase 3:
  E. Product Platform Line and Strategy
  F. Economic and Financial Analysis
  G. Failure Mode and Effects Analysis

ACTIVITIES MATRIX

X represents correlation with other activities

	A	B	C	D	E	F	G
A	A						
B		B					
C	X	X	C				
D	X	X	X	D			
E					E		
F						F	
G							G

GANTT

A	███					
B		███				
C			███			
D			███			
E				███		
F					███	
G						███

PERT chart

Optional but helpful

| Design for manufacturability (F) | Prototype strategy (G) | Concurrent engineering (H) |

Line Strategy (C)

Phase II backlog (A) → Phase III planning (B) → Economic/ financial modeling (D)

Failure modes and effects analysis (E)

Phase III report (I) → Project presentation (J)

Critical Path (CPM):
A->B->E->D->C->(F)->(G)->(H)->I->J

4. Financial Modeling for New Product Development.
An important issue in new product development that we will be addressing in the near future is the construction of detailed Excel-based financial models to analyze the cash flows involved in developing a new product. The first step in this process is for you to develop proficiency in Excel within the context of financial modeling. To this end, locate the "Financial Modeling" tutorial on the course website, then complete the first two steps in the tutorial (Pages 1-7), and submit a well-structured and clear write-up of your implementation of Steps 1 and 2 in the tutorial. Your write-up must include the relevant Excel spreadsheets as supporting evidence.

Step 1: Define the real problem.
        SP1: Complete the first two steps of "Financial Modeling" tutorial on the course website.
Step 2: Plan how to solve the problem.
        Assumptions: I am an engineer developing a financial model for an NPV analysis for my boss.
        Available Information: The Financial Modeling worksheet on the class website and info on the internet.
        SP1: Complete the first two steps of "Financial Modeling" tutorial on the course website.
                Step 1: Build a Scenario Parameters Worksheet.
                Step 2: Build the BaseCase NPV analysis worksheet.

Step 3: Execute the plan.

　　　　SP1: Build a Scenario Parameters Worksheet.

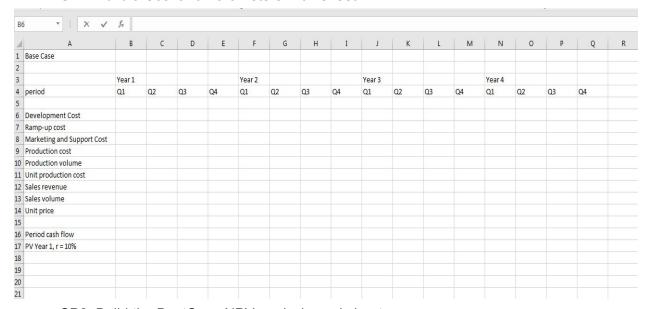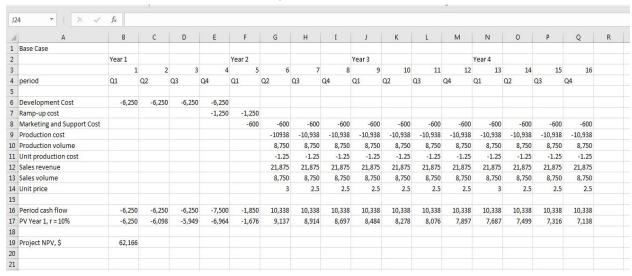|	B6	▼	:	×	✓	fx												
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	Base Case																	
2																		
3		Year 1				Year 2				Year 3				Year 4				
4	period	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
5																		
6	Development Cost																	
7	Ramp-up cost																	
8	Marketing and Support Cost																	
9	Production cost																	
10	Production volume																	
11	Unit production cost																	
12	Sales revenue																	
13	Sales volume																	
14	Unit price																	
15																		
16	Period cash flow																	
17	PV Year 1, r = 10%																	
18																		
19																		
20																		
21																		

　　　　SP2; Build the BestCase NPV analysis worksheet.

	J24	▼	:	×	✓	fx												
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	Base Case																	
2		Year 1				Year 2				Year 3				Year 4				
3		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
4	period	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
5																		
6	Development Cost	-6,250	-6,250	-6,250	-6,250													
7	Ramp-up cost				-1,250	-1,250												
8	Marketing and Support Cost					-600	-600	-600	-600	-600	-600	-600	-600	-600	-600	-600	-600	
9	Production cost						-10938	-10,938	-10,938	-10,938	-10,938	-10,938	-10,938	-10,938	-10,938	-10,938	-10,938	
10	Production volume						8,750	8,750	8,750	8,750	8,750	8,750	8,750	8,750	8,750	8,750	8,750	
11	Unit production cost						-1.25	-1.25	-1.25	-1.25	-1.25	-1.25	-1.25	-1.25	-1.25	-1.25	-1.25	
12	Sales revenue						21,875	21,875	21,875	21,875	21,875	21,875	21,875	21,875	21,875	21,875	21,875	
13	Sales volume						8,750	8,750	8,750	8,750	8,750	8,750	8,750	8,750	8,750	8,750	8,750	
14	Unit price						3	2.5	2.5	2.5	2.5	2.5	2.5	3	2.5	2.5	2.5	
15																		
16	Period cash flow	-6,250	-6,250	-6,250	-7,500	-1,850	10,338	10,338	10,338	10,338	10,338	10,338	10,338	10,338	10,338	10,338	10,338	
17	PV Year 1, r = 10%	-6,250	-6,098	-5,949	-6,964	-1,676	9,137	8,914	8,697	8,484	8,278	8,076	7,897	7,687	7,499	7,316	7,138	
18																		
19	Project NPV, $	62,166																
20																		
21																		

Step 4: Check Your Work.

　　　　My work matches up with the sample spreadsheets provided and I am confident it is correct.

Step 5: Learn and Generalize.

　　　　We can use Excel to solve problems about the cost of projects we are considering developing. This is much faster than doing all the calculations by hand.