Engineering Institute of Technology.

Fundamentals of Professional Engineering (FPE)

Segment Help

Version	2.1		
Created by	Deon	**Date**	2019
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SEGMENT 1

Project Charter

You can use the short (one-page) version of the PMDOCs template for the Project Charter and paste it into your template when done. Just do the following:

- Remove their title page, because you already have your own.
- Replace the green headings with your own (properly numbered) ones, e.g. <Paragraph 1: Formally authorize the project> becomes 1.0 Project Authorization.
- Delete all their text after studying it in order to get an idea of what to write.

Community

You can select any community on the planet. The people may be fictitious, but the site must be:

- Real, i.e. not in the middle of a lake
- Remote (sparsely populated)
- Without electrical infrastructure

It will help if some members of the group are familiar with the culture of the targeted group, as well as political, legal, and other issues that could impact on the project.
Structure this section as follows:

1. Introduction

Write a short introductory paragraph.

2. Site for Proposed Installation

Provide details about your selected community such as name/country/state/region etc., and also provide the exact latitude and longitude. It can be a fictitious community, but the location must be real.

3. Topography

Snag a Google Earth view of the location and paste it here. This serves to confirm that your site selection is valid (i.e. not in the middle of a lake!)
For all sections please use a proper technical writing approach. For example; do not simply paste in a screenshot for section 3 without some accompanying text.

SEGMENT 2

Alternative Solutions

Try to come up, as a group, with at least three solutions. These need not involve three totally different energy sources. You could also have, say, three different types of wind systems.
At this stage no detailed design is necessary.

Try to describe the basic concepts as best you can, but do not make a decision yet.
This is one part of the project where brainstorming is VERY important; try to get everyone on a conference call.

Alternative Analysis

For this section you need to do *at least* a grid analysis. Some groups augment that with other techniques, such as a 'force field analysis' or a SWOT analysis. Refer to webcast 1D for details on decision making.

For the grid analysis, use at least four selection criteria. There is an example in the notes, but the process for deciding which car to buy (in the assignment) is 100% analogous to this one. The only difference is that the assignment question did not require group consensus.

The example below comes from your reading material.

Figure 2: Example Grid Analysis Showing Weighted Assessment of How Each Type of Car Satisfies Each Factor

Factors:	Cost	Board	Storage	Comfort	Fun	Look	Total
Weights:	4	5	1	2	3	4	
Sports Car	4	0	0	2	9	12	27
SUV/4x4	0	15	2	4	3	4	28
Family Car	8	10	1	6	0	0	25
Station Wagon	8	15	3	6	0	4	36

In the real world consensus in decision-making is critical, and in that regard TradeOff really becomes a valuable tool. Unfortunately the evaluation copy only allows for 4 participants, in which case you will need to get group consensus via, say, a Skype meeting and have have one person feed the data into TradeOff at the same time.
You can get the TradeOff tutorial here, if you have not downloaded it earlier on.
Here we will choose the best solution. However, leave the *detail design* for later in the project.

Context Analysis

Context Analysis (Environmental Impact Analysis) refers to the analysis of an environment in order to identify key influences during a project that could impact on the project objectives, or could be affected by the project performance.
Refer to the following page Environmental Impact for more details.
The context analysis also includes identification of the various stakeholders, and is a very important part of your document.
The context analysis includes both the internal and external environment ('PESTLE factors') as decribed in PESTLE

Problem Definition

The basic definition of the problem is embedded in the Project Overview. We do, however, recommend that you do not simply copy and paste it into the template, but that you rewrite it in your own words and, where applicable, elaborate in the issue based on the actual community and geographical location you defined in Segment 1.

Requirements Analysis

This could also be called a Functional Specification. It documents 'what' the system must be able to do, but not 'how' it must be done

Take a close look at the system requirements in terms of:

- Inputs
- Outputs
- Functions
- Environmental issues
- Packaging issues
- Structural issues
- Operational issues
- Safety issues
- Maintenance issues

Try to add as much detail as you can. For example; how many lights per household, for how many hours a day, at how many lumens, and so forth. In real life the client is often not a technical person, and it is therefore up to you to 'fill in the gaps' in the requirements that have been conveyed to you via the Project Overview.

***Please note that at this stage we need to document only the REQUIREMENTS and not the SOLUTION. That will follow later.*

Risk Analysis

In this section you will identify the risks, and perform a **qualitative** risk analysis using the 5x5 matrix approach. Refer to AS/NZS ISO 31000. You can get a copy from the Indian Bureau of Standards, which is identical to the International version, here. You will need to create a 5x5 matrix to map your risks. Google 'risk matrix' and you will get examples like this:

		A	B	C	D	E
		Negligible	Minor	Moderate	Significant	Severe
E	Very Likely	Low Med	Medium	Med Hi	High	High
D	Likely	Low	Low Med	Medium	Med Hi	High
C	Possible	Low	Low Med	Medium	Med Hi	Med Hi
B	Unlikely	Low	Low Med	Low Med	Medium	Med Hi
A	Very Unlikely	Low	Low	Low Med	Medium	Medium

Create your own copy with Excel.

Next, identify (list) all the possible risks for your project. Once again you can use a search engine to find sites like this. Also consider the following Critical Success Factors as potential risks (although not all if the points mentioned will apply to you):

- Issues related to the specific project e.g. size, complexity, technology, number of interfaces
- The project manager and team e.g. expertise, systems, personality, resources, levels of authority
- The customer organization e.g. commitment, response times, knowledge
- The external environment e.g. social, cultural, political, economic, financial, technical, legal, contractual

Finally, create a risk register such as the one from PMDocs.
Cross-reference your risk register and your matrix.

SEGMENT 3

Detailed System Specification

You can build upon the information in the Functional Specification (i.e. inputs, outputs, functions, packaging, environment etc.).
However, because you have now decided on a specific solution to the problem, you can enhance the specifications considerably.
You also need to add a block diagram (a.k.a. 'EC structure', or 'Structure of Elements and Couplings') for tour proposed system, and possibly a diagram representing the operation of your system a.k.a. 'ST structure' or 'State Transition structure'.

Preliminary Scope Statement

There are many (preliminary) scope statement templates available online.
Here is one from Project Management Documents and Templates, and another one from Project Management Docs. Choose one (or a combination of the two) and paste the result into your Segment 3 template.

Work Breakdown Structure

Consult the WBS tutorial (the same one you used when doing the FPE assignment).
Please use the following WBS template courtesy of www.pmdocuments.com (they have other WBS resources as well). It is self-numbering and includes and includes a column (C) for the dictionary.

At this stage you only need to complete columns A, B And C.
You can snag the completed part and paste it into the Segment 3 template, but keep the Excel spreadsheet for use in the next phase of the project.

SEGMENT 4

Project Budget

Most project management software packages can generate detailed cost summaries. Unfortunately GanttProject seems unable to do it at this stage, which means that you will have to extract the cost information from your updated WBS and then include it in your template in another form (e.g. a customized Excel spreadsheet.

Project Calendar

This is your Gantt chart.
We will not be prescriptive when it comes to the Project management software you use. However, we recommend GanttProject for several reasons, including:

- It is free.
- Learning to use it is a breeze.
- All group members can install a copy, which means that you can share project files.

You can download it here. If you already have a copy installed. Ensure that the version number is 2.7 or beyond. You can also download a short tutorial here.

Before you can display a Gantt chart, you will have to feed the relevant data into GanttProject. This is where an updated WBS comes in handy.

First get 'all your ducks in a row' by updating your WBS, then enter the data into GanttProject.

Follow the link in the previous sentence to read more about updating your WBS.

Network Diagram

This is the PERT chart. We will not be prescriptive when it comes to the Project management software you use. However, we recommend GanttProject for several reasons, including:

- It is free.
- Learning to use it is a breeze.
- All group members can install a copy, which means that you can share project files.

You can download it here. If you already have a copy installed. Ensure that the version number is 2.7 or beyond. You can also download a short tutorial here.

Before you can display a PERT chart, you will have to feed the relevant data into GanttProject. This is where an updated WBS comes in handy. First get 'all your ducks in a row' by updating your WBS, then enter the data into GanttProject. Follow the link in the previous sentence to read more about updating your WBS.

You are welcome to use any software package you like.

Updated WBS

In Segment 3 you created a basic WBS, which looks like this:

	A	B	C
1	**Renumber Tasks!**		
2	**WBS Number**	**Task Name**	**WBS Description**
3	**1**	**Develop the Shopping Cart**	The Shopping Cart will need to be developed for the Web Site. This effort requires development of a database structure and loading the product data.
4	1.1	Develop the Database Structure	
5	**1.2**	**Load Data into the Database**	
6	**1.2.1**	**Build the Product Catalog**	
7	1.2.1.1	Identify Products	
8	1.2.1.2	Contact Vendors	
9	1.2.1.3	Submit Agreements	
10	2	**Purchase the Infrastructure**	
11	2.1	Purchase Hardware	
12	2.2	Purchase Software	
13	3	**Develop the Web Site**	
14	3.1	Design the Interface	
15	3.2	Build the Web Interface	

Note that only the yellow entries represent work.

You now have to complete the test of the spreadsheet.

D	E	F	G	H
Responsible Person	**Duration (days)**	**Labor Cost**	**Fixed Cost**	**Predecessors (spaced with commas)**

The labor cost (column F) is the total number of each resource (person) times the hourly rate for that resource. You can work this out with a calculator, but GanttProject version 2.7 onwards will also do this for you (see here) on a per-task basis although it cannot aggregate the costs to give you a grand total.

Not all resources may be required for 100% of the time. If someone is only involved say 50% of the time, GanttProject can take this into account (see the webpage referred to in the previous paragraph).

Material costs or fixed subcontractor costs go into column G.
To get the total project cost you have to Autosum columns F and G.

Column H is for the dependencies. For this project we will stick to simple Finish-Start relationships. So, if 3.2 (Build the web interface) depends on 3.1 (Design the interface) as well as 2.2 (Purchase software), you will enter 2.2, 3.1 in this column.

Once you have updated the spreadsheet, you can transfer the information to GanttProject.

SEGMENT 5

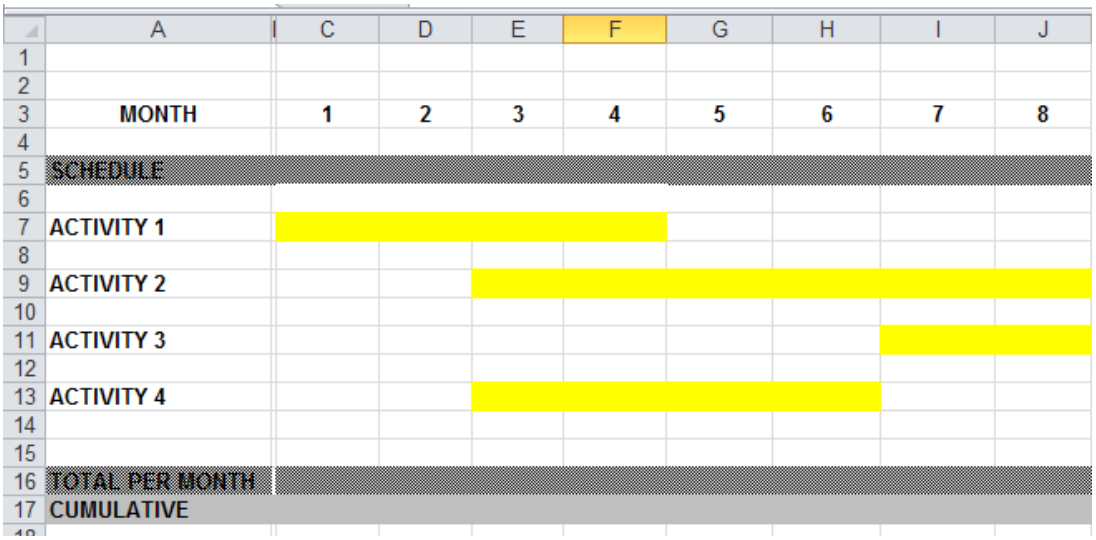
Project Cash Flow

The updated WBS shows the total expenditure. However, we now want to predict the project cash flow on a monthly basis.

Assume the following:

- Material costs (if any) are incurred in the first month of any given work package.
- Labor costs are uniformly spread across any given activity.

Create a spreadsheet along the following lines, for the duration of the project. The activities are the work packages as per your WBS, and the duration (the yellow bars below) are from your Gantt chart. Do not try to split hairs here. If a task starts somewhere in Month 1 and ends somewhere in Month 3, then show a bar running across all three months.



	A	C	D	E	F	G	H	I	J
1									
2									
3	MONTH	1	2	3	4	5	6	7	8
4									
5	SCHEDULE								
6									
7	ACTIVITY 1								
8									
9	ACTIVITY 2								
10									
11	ACTIVITY 3								
12									
13	ACTIVITY 4								
14									
15									
16	TOTAL PER MONTH								
17	CUMULATIVE								

Let's assume 'Activity 1' is actually Prototype Development. The material cost is $15,000, so we enter that in cell C7. Also assume that the total labor cost is $40,000. We apportion that in equal amounts to months 1, 2, 3 and 4 i.e. we enter $10,000 into cells C7, D7, E7 and F7. Of course there is already a $15,000 material cost in C7, so there we hit F2 and edit the cell so it contains 15,000+ 10,000. And so on.

Now add up each column (C16, D16 etc.) to get the monthly total.
Next, create a running (cumulative) total in cells C17, C18 etc.
Finally, graph the two rows (16 and 17).

Ethics

Write something on how this issue relates (or could relate) to **your project**.
This is of particular importance when dealing with third-world communities.
Please stick to specifics and do not write a generalized article on the topic.
Address any ethical dilemmas that might arise from the project.
Also address liability issues.

Global And Environmental Issues

Write something on how this issue relates to **your project**.
Please stick to specifics and do not write a generalized article on the topic.

Leadership

Write something on how this issue relates to your project.
Please stick to specifics and do not write a generalized article on the topic.

Responsibilities of the Engineering Associate

Write something on how this issue relates to **your project**.
Please stick to specifics and do not write a generalized article on the topic.
Refer to social, cultural, environmental and global responsibilities, and how you will address them.

Health and Safety

Write something on how this issue relates to **your project**.
Please stick to specifics and do not write a generalized article on the topic.

Engineering Standards and Codes of Practice

Write something on how this issue relates to **your project**.
Please stick to specifics and do not write a generalized article on the topic.
Also list (as many as you can) standards and codes of practice applicable to your project.

Sustainability

Write something on how this issue relates to **your project**.
Please stick to specifics and do not write a generalized article on the topic.

SEGMENT 6

FPE Group Project Presentation

A Quick Guide to Using Blackboard Successfully

- Groups will be provided with two room links. One is the moderator link and is to be used by the group leader only. Only one person can use the moderator link at one time so it is important that you use the correct link. The other link will be for the remainder of the students in the group.
- As the moderator you will not need to log in using your name, the link will take you straight into the room. Under participants you will be listed as *IDC Technologies-Moderator*.

Step 1- Test Audio

Tools > Audio > Audio Setup Wizard

Step 2- Load Content (Moderator only)

All members are to take turn in presenting, however will need to request from the moderator to move over to the next slide

To load your PowerPoint slides click “Load Content” and select your file.

Your slides will initially open in PowerPoint and THEN Blackboard, it may take around 10 seconds so be patient.

You will see a navigation pane in the middle of your slides called “Page Explorer”, you can close this and use the arrows at the top right hand corner to scroll through the slides.

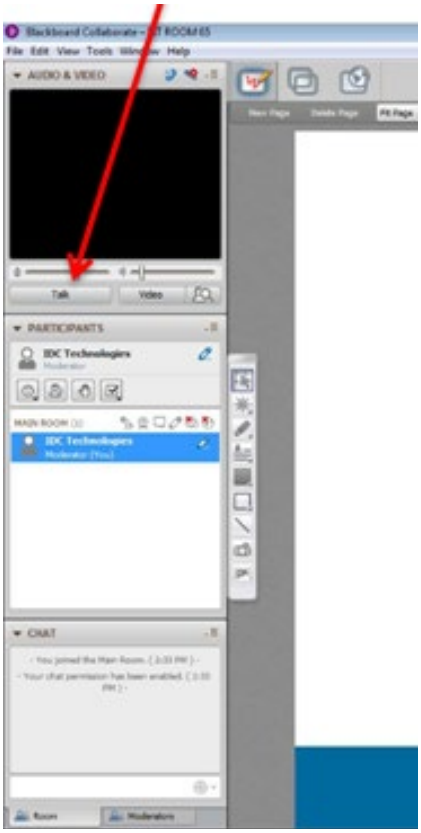
Step 3- Click Record (Moderator only)

This Is Very Important, If You Don’t Click Record You Will Need To Redo Your Presentation

Your session will need to be recorded so it can reviewed at a later time. The button can be found in the top right hand corner.

Once you have completed your presentation, click Record off and exit the room. All members must exit the room or the recording will not be sent through to EIT staff.

Step 4- Talking



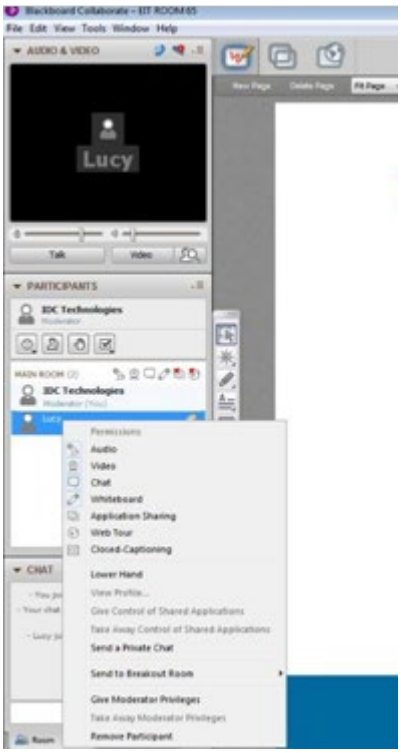
The number of simultaneous talkers can be set by the **moderator only** by going to Tools > Audio > Maximum Simultaneous Talkers. Set the number of talkers to the number of people participating in the presentation. All group members will now be able use the talk button at once.

If your group exceeds 6 members, change your maximum number of simultaneous talkers to 1. The group leader will then control the microphone and only when they release the talk button, will other group members be able to activate the talk button and speak.

When the maximum number of simultaneous talkers is set to one, **members must always remember to click off the talk button once they are done so other members can talk.**

The **moderator** has the ability to override any actions or permissions of the other participants. To do this right click on the participant's name.

This would be used mostly if the maximum number of simultaneous talkers was set to one and a group member had not clicked off the talk button. The moderator could simply right click on their name and turn off audio permissions.


Lucy
PARTICIPANTS
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Audio
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Chat
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Application Sharing
Web Tour
Closed-Captioning
Lower Hand
View Profile...
Give Control of Shared Applications
Take Away Control of Shared Applications
Send a Private Chat
Send to Breakout Room
Give Moderator Privileges
Take Away Moderator Privileges
Remove Participant