#### **Assignment L3-E**

#### **Testing an Assembly Plan & Evaluation**

Now that you have your artifact dissected it is time to analyze the parts and think about how your artifact can be manufactured (i.e., assembled). While the main emphasis is going to be on assembly, you could spend some time reviewing the parts and discussing how they might have been manufactured.

##### **The Assignment**

Your specific assignment is as follows:

1. Create a Bill of Materials (**BOM**) for your artifact and its parts. A BOM is a table that lists each distinct part and for each part includes the following: the part name, a part number, the location in the notebook of the part sketch (drawing), the number of such parts in the artifact, and what the part is made out of.
2. Create an **Assembly plan**
   1. study your **parts & BOM** and develop an initial assembly plan.
   2. evaluate your initial assembly plan by undertaking a Potential Problem Analysis (PPA) to highlight potential assembly problems.
   3. using the results of the PPA work, revise your assembly plan. It is expected that there will be explicit evidence that the results of the PPA work were used in the revised version of the assembly plan.
3. Test and assess your assembly plan using the Willing Workers
4. Prepare the discussion of the testing of your assembly plan and efforts undertaken to generate the plan, i.e., complete the “sandwich” for the Testing task.
5. After the assembly plan discuss the result of the final product in relation to its Impact on environment (Environmental Impact Statement).
6. Discuss the result of your final product in relation to Social & Cultural Impact.
7. Prepare a discussion of the entire L3 assignment, i.e., complete the “sandwich” that was started in class when you prepared a Context for the Entire Project.

**Note**: How the team presents its assembly plan is entirely up to the team. It is expected that the final version of the plan will include the following:

* a good integrated mixture of drawings, figures, and text,
* **explicit** evidence of the improvements stemming from the PPA work, and
* the capability of being understood by the Willing Workers, who have never seen the artifact before.

##### **The Work In The Notebook**

Again (last time), as you do your work completing this assignment, present the work using the presentation sandwich. We (the Laboratory Instructors, your customers) are **NOT LOOKING** for a report; rather we are looking in your Design Notebook for an organized presentation of your work. **The work need not be word-processed** but it must be neat and readable. Word processing everything is not a way to exceed expectations.

It is expected that your first attempts at an assembly plan will not be your last. If you use a presentation sandwich to present your work for each new attempt at an assembly plan you can show several different stages in the development of your final plan and the discussion/context “slices of bread” can connect the pieces of work together. You may want to put the final assembly plan in its own tabbed section of the Design Notebook with the work leading up to the final assembly plan being in the Project 1 Section.

Much of the KTPPA work will be done as a team during a team meeting. It is important to not lose the discussion that takes place as the team builds the table. It is expected that there will be more than just the final table in the notebook; **the important parts of the team discussion that lead to the values in the table are expected to also be present**.

Don’t forget to include evidence that you are functioning as a team (team meeting agendas, minutes, etc.)

##### **The Assessment**

This work will be collected a week after the testing of the assembly plan and will be assessed using the Fifth Notebook Review Checklist. While it is possible to exceed expectations for the assembly plan itself, e.g.,

* the degree and quality of drawing/text integration exceeds the expected existence of both types of material or
* the level of completeness or thoroughness of the plan exceeds what is needed and adds to the ease of assembly by the worker),

the most reliable way to exceed expectations is have an outstanding presentation of the process used in doing this entire project. A Design Notebook, which is complete and which clearly documents why the decisions were necessary, how the decisions were made, what the decisions were, and what the consequences of these decisions were, is a Design Notebook that exceeds presentation expectations for a first effort at capturing the design process. Also a notebook that presents the work as a unified whole, rather than a collection of five assignments, is a notebook that exceeds expectations.

You should bear in mind as you do this work and consider what might exceed expectations that

* spending time, effort and money on creating color graphics does not automatically lead to a work product that exceeds expectations; the color must add to the information transfer; it must have a purpose beyond “looking nice”.
* the use of videos and computers in the assembly process does not ensure an exceeds expectations; technologies have been used in the past and you are probably not creating a new use of the technology.

However, the collection of work in the Design Notebook that shows how and why the team decided to use a video or computer presentation and further shows how this presentation was developed would be the sort of effort that has a good chance of exceeding expectations.

A second way that might lead to exceeding expectations is to write Discussions for L3e and L3 that show the team has learned more than expected or has grasped the concepts and tools at a Level of Learning that exceeds what was expected (Comprehension Level of Learning is expected).

***Environmental Impact Statement:***

For Environmental Impact Statement, First of all evaluate your final product. You may have suggested some modifications in the current product. In relation to the original product and new changed product discuss the Impacts of your work product on environment.

“Environment” considered in an EIS includes LAND, WATER, AIR, STRUCTURES, LIVING ORGANISMS, ENVIRONMENTAL VALUES AT THE SITE, and the SOCIAL, CULTURAL, AND ECONOMIC ASPECTS.

An “IMPACT” is a change in consequence that results from an activity. Impacts can be positive or negative or both. An EIS describes impacts and ways to mitigate (to lessen or remove negative impacts). An EIS is a document describing the impacts on the environment as a result of a proposed action. It also describes impacts of alternatives and plans to mitigate the impacts. EIS may be found relevant to your field. Engineering codes of ethics may be consulted for environmental concerns. Engineering decisions have environmental impacts; such decisions should therefore be made in light of environmental impacts in addition to other aspects.

Students to use social and environmental enquiry processes to conduct an environmental impact investigation of the proposed project. This phase ends with students attempting to reach a decision about whether the project should proceed.

***FOCUS QUESTIONS****:*

•What is an environmental impact statement (EIS)?

•How can data be collected for an EIS?

•Based on data about one aspect of the project, should it proceed?

•Based on the combined data on a number of aspects of the project, should it proceed?

•What environmental, economic, social, political and/or cultural issues are revealed in this investigation?

# **Investigating the possible impact of the proposed Project**

Possible method of investigation:

–Conduct experiments, measurements or tests in the area

–Visit the proposed site to make observations

–Gather advice from the experts

–Find out about similar projects elsewhere

–Survey large number of people

–Any other methods

After collection of data, students should plan their report and discuss how to support the arguments, conclusions and recommendations in their report. Alternatively, students may use an EIS about another project but should be able to critique it. Findings should be reported and presented.

Important: **The students are required to use their imagination to answer these questions. *They will be evaluated on the quality of their analysis.***

***Cultural & Social Assessment:***

Project might have direct/indirect, short/medium/long term impact on some sectors of the local, national and/or international society. The project report should assess the acceptability of the proposed design by the neighboring and/or end user society. The project final report should describe any cultural and social concerns associated with the design, manufacture or use of the proposed project.

Social impacts are generally categorized under the following headings:

* + Community Cohesion (neighborhood)
  + Community Facilities and Services
  + Mobility (movement); and
  + Safety

Community Facilities and Services mainly include:

* + Schools
  + Religious centers
  + Parks, recreation centers
  + Libraries
  + Hospitals
  + Emergency Services

The project final report should include statement(s) if any social/cultural goals will be achieved directly or indirectly by this project.

How will this project influence community?

Will the project act as a tool for socialization by any means?