

Project 6.5 Product Reverse Engineering Presentation

Introduction

Displaying your work is an important aspect in many different fields of engineering. How you arrive at your ideas, solutions, and conclusions must be communicated. Making presentations of your work is a method used by many engineering firms to determine if the team has worked together successfully and if all team members have shared in the work.

In this project you will complete several pre-activities that will enable you to collect the information needed in order to make your display. It is imperative that you keep good notes and refer to your team to make sure everyone has the same information. Team members who are consistent in their understanding and who communicate with each other are necessary for success.

You and your team will be expected to make a poster presentation of your findings. You will create either a physical tri-fold poster or an electronic poster to display your product and the information that you have gathered.

Equipment

- Engineering notebook
- Product Disassembly Chart
- Product part sketches
- Product part 3D models
- Mass property analysis results
- Paper
- Computer with 3D CAD modeling software
- Disassembled consumer product
- (Optional) Tri fold foam board

Procedure

In Activity 6.4 Structural Analysis Automoblox (or Activity 6.4b Product Disassembly), you and team mate(s) examined the structural characteristics of your consumer product. You created a chart that identified the parts and measurements, and you created and gathered other important information, such as isometric sketches for each part and mass property analysis results. You will document and present the findings that resulted from your reverse engineering process.

1. **If you have not already done so**, create an isometric sketch and quick orthographic projections of each part of your product. Note that these sketches are intended to provide a means to record dimensions and notes – they should be neat but not necessarily to scale. Measure each part then label and dimension

the sketches. Be sure to annotate the sketches with all dimensions necessary to accurately model each part.

2. Create a 3D solid model of each part of your consumer product. Discuss with your team mate(s) who will model each part. Also, determine to what degree of accuracy you will dimension the parts in the CAD software, what file name you will use to save each part model, where the files will be saved, and what part modeling procedures you will use. Communicate with your partner throughout this assignment so that both of you abide by the standards identified.
3. Have your teacher check your progress and the modeling of your parts as you work.
4. Perform a mass property analysis of each part using the 3D modeling software.
5. Create a multi-view drawing for each part to include necessary orthographic projections and an isometric projection. You need only provide overall dimensions on the orthographic projections. You will create fully dimensioned part drawings in the **next** unit.
6. According to the instructions of your teacher, create a physical poster, an electronic poster, or a slide show presentation that includes the following:
 - Rendered isometric drawing with a title bar and notes showing the following information for each part of the product:
 - Name of Part
 - Overall Dimensions of Part
 - Material of Part
 - Density of Material
 - Volume
 - Surface Area
 - Mass
 - A photographic image of each part with a part label that corresponds to the drawing of each part
 - A photographic image of the assembled product.
 - A brief description of your findings during each phase of the reverse engineering process to include:
 - Visual Analysis. Include photographic images of various views and a description of the visual elements and principals of design.
 - Functional Analysis. Include an explanation of the operation of the product using photographic images or views of the part solid models where appropriate.
 - Structural Analysis. Include the Disassembly Chart.
7. **(Optional) Prepare a three-minute presentation that answers the following questions:**
 - What is your product?
 - What is your product's function?
 - What did you learn about the product's mass property analysis?

Conclusion

1. Is there another reason for product disassembly besides the modeling and electronic documentation of parts?
2. Explain the process used to complete a mass property analysis, and explain why this process is commonly used in industry.
3. Describe how important it is to have good interpersonal communication skills in a technically related field, such as engineering and design.