

Supply Chain Models: Manufacturing and Warehousing

IsyE 3104

Project I : Aggregate Planning

Project Summary

In this project, you will have a chance to work on a case study – The Groundhog’s New Clothes. The case chronicles the dilemma facing the owners of Beauti-Phil Apparel, a fictional clothier operating in northwest Pennsylvania. The firm has lost one of its major accounts and must produce an aggregate production plan and use it to decide whether or not to reduce the size of its workforce due to the drop in demand. The owners of the company have a strong relationship with their workforce, making layoffs and firings difficult for them personally. The owners have also received a proposal from a lower-cost but potentially environmentally-irresponsible raw material supplier, and they must choose whether or not to accept the offer. They are looking for advice on how to handle these two ethical dilemmas—reducing the size of a historically loyal workforce and procuring materials from a cheap but irresponsible supplier. As in most managerial decisions, the owners must determine how to balance profits and other conflicting values; in this case, these other values are trust, loyalty, and environmental responsibility.

To help them, you’ll start by producing alternative aggregate production plans to determine Beauti-Phil’s workforce requirements in order to satisfy their forecasted demand. You’ll then consider the aggregate production plan along with the additional qualitative information and arrive at a recommendation for the owners of the company about the possibility of changing the size of the workforce and accepting the proposal from the new raw material supplier. In accordance with sound ethical reasoning methodologies (see attached document on ethical reasoning), you will need to identify important considerations before making the decision and alternative viable conclusions that you choose not to adopt.

Objectives

The main goal of this case is to expose you to the type of complex decision environment that you will experience as industrial engineers, operations professionals or business consultants. Rarely are the real-life problems that you must solve as strictly quantitative as ones you usually receive for homework or on exams. Additionally, technical programs generally focus on mathematical models and quantitative methods at the risk of ignoring other important concerns in making decisions. This case requires you to solve an analytical problem (producing an aggregate production plan) and then use that information to make an ethically defensible decision in light of the additional information, just as you would have to in a professional environment.

In real life, there is typically not one right answer or one correct path of action. It is most important to come to your own conclusion and defend it. In this case, you will need to explain why you chose your conclusion and rejected the alternatives. By considering

opposing positions and consciously explaining why you reject them, you will be able to exhibit the fact that you have thoughtfully considered the impact of their conclusion.

Another objective of this case is to give you an opportunity to sift through a large amount of information to identify the data that is important for a particular model. The aggregate production plan requires several different cost estimates (hiring cost, firing cost, production cost, etc.) that are scattered throughout the case among irrelevant information. Some of these costs must be computed from other information. Successful completion of this case shows that you understand the relevant inputs for an aggregate production plan model, giving you the ability to do this kind of work in a real-life situation.

Project Guidelines, Questions and Grading Scheme

Guidelines

The project should be done in groups of 4, but one project report should be submitted. The due date of the project is September 13 for Section A, September 14 for sections B and C.

We will discuss your proposals in class on the day the project is due.

Start by reading the attached case carefully. Note the data that is given in the case to help you answer the following questions:

Questions and Grading Scheme

Clearly, there are many potential actions that the Franklins could take regarding their personnel in light of the six-month demand forecast. Several alternatives are:

- Keep the status quo (current workforce size and raw material supplier)
 - Adjust the size of the workforce while using the current raw material supplier
 - Keep the workforce size the same and use the new raw material supplier
1. Suggest *one* additional alternative that is different from the three provided above. For each of these four alternatives, produce a six-month aggregate production plan and determine the total cost of each plan (ignoring any time value of money considerations). Summarize the recommended decisions for each month in a table. Include the analysis that you did for each alternative in an appendix. Explicitly define any parameters and variables that you used in your analysis, and provide the formulation of any mathematical models or techniques employed to produce each aggregate plan. (50%)
 2. Prepare a two- to three-page single-spaced memorandum addressed to the Franklins that includes the following:

- a. Identify the stakeholders¹ who will be affected by the Franklins' decisions and determine how each stakeholder will likely be affected by each of the five potential alternatives under consideration. Identify the most important trade-offs stemming from conflicting stakeholder interests that the decision maker must consider and describe the ethical dilemmas the Franklins face in this situation. (20%)
- b. Provide your recommendations and supporting arguments about the alternative that the Franklins should take regarding their personnel and the raw material proposal. (10%)
- c. Explain why you reject the other viable alternatives that you identified earlier. (10%)

The final 10% of your grade will be attributed to the spelling, grammar, style, and conciseness of your memorandum.

¹ A *stakeholder* in a decision is any entity that will likely be affected by the decision being made.