**Final Project**

**Sample Only**

This document was submitted by students in a previous class. Their requirements were different from yours. We offer it only as a sample of what a project was for that class. Copying this document, in whole or in part, and submitting the result as your own work, would be a violation of the honor code.

**Revision 4**

**Dynamo**

1. **Problem statement and approach**

The objective of the Dynamo team is to develop a business model that will help the company’s senior leadership and financial managers determine which strategy will maximize profits for the magazine company and evaluate the impact of different economic environments on the company’s financial performance. In order to accomplish this, the team initially set out to model the following two scenarios which were described in the original project proposal:

* + Scenario 1 - The company pursues a 70% retail operation, and a 30% Distribution operation. A retail operation provides a 10% profit margin on inventory, but overhead costs are higher.
  + Scenario 2 - The company pursues a 30% retail operation and a 70% distribution operation. A distribution operation provides a 5% profit margin on inventory, and overhead costs are lower than running a retail operation.

Upon further review of the scenarios, the group decided it would be better to focus our efforts on evaluating the financial performance of the magazine company under different economic environments. This allowed us to develop a realistic model that was not overly complicated and ensured we had a dynamic model. As a result, we refined our proposal and modeled the following scenarios instead:

* + Scenario 1 - There is stable demand & costs for magazines and newspapers and there is no financial crisis.
  + Scenario 2 - There is a financial crisis projected to last at least 3 years and prices are increasing.

In the initial proposal, we listed very broad definitions of the type of inputs, parameters and outputs the team would develop to determine the company’s net profits. Since then the team has worked to better define the specific inputs streams, parameters and parameter blocks as well as the outputs that will be used to develop the model. This has enabled us to get a better sense of the structure for the model and identify specific components that will be assigned to team members.

As a result of shifting our focus from maximizing profits for the company to evaluating its performance under different economic environments, we’ve had to make several revisions to our proposal and financial model. This in turn had an impact on our budget and timeline for the project. Details of the changes to our budget and schedule are discussed in the budget and schedule performance section below. The revisions were necessary because they allowed us to assess our model at an early stage in the process and ensure that it is structured in such a way that we can easily measure the company’s bottom line under different economic situations. These revisions have also given us a better sense of the components we needed to focus on and identify which areas of the project required more effort. This ensured that we were meeting our stated objective of developing a business model that helps the magazine company’s leaders make informed strategic decisions regarding their company’s financial performance.

1. **Descriptions of scenarios**

As noted above, our objective was to model the magazine company’s expected financial results under two different economic environments. Below is a description of the two scenarios.

**Scenario 1 -** There is stable demand & costs for magazines and newspapers and there is no financial crisis. We’ve made the following key assumptions:

* The economy is stable and there is consistent demand for our products.
* Each retail facility employs has only one clerk on duty at all times. The store employs part-time and full-time employees to cover the weekly hours.
* Each retail facility is open 12 hours per day/7 days per week and is never closed for holidays.
* There is one distribution warehouse that serves all retail operations and distribution operations.
* There are two warehouse managers that split a total of 50 hours per week for one location.
* There is one truck driver that works 40 hours per week.
* A truck for the warehouse operations costs $900 per month to lease and operate. This assumes that the price for gasoline is under $2 per gallon.
* Each retail store and distribution location receive exactly the same delivery quantity.

**Scenario 2 -** There is a financial crisis projected to last at least 3 years and prices are increasing. Key assumptions are:

* Demand is unstable, costs are increasing and there is a downturn in the economic 2-3 year future outlook.
* The rate of unsold inventory increases from 10% to 15% every quarter in scenario 2.

The model details expected sales and costs for these scenarios over a 3 year time period broken into quarters and includes the following general assumptions for both scenarios:

* 40 truck driver hours are needed for each increment of 25 locations.
* Tax expense is paid on a quarterly basis using a financial model to project the estimated taxes due.
* Truck costs include all costs to lease and operate the truck.
* Assumes all labor costs are fully loaded & contain any auxiliary costs such as FICA, WC, etc.

The main difference between scenario 1 and scenario 2 is the rate of unsold inventory per quarter. As the economic environment continues to worsen over the 3 year period, we expect demand for some of our magazines to decrease, which will result in an increase in unsold inventory. As the amount of our unsold inventory increases, revenue will decline while our costs continue to increase, resulting in a negative impact on the company’s net margin.

By modeling the impact of an economic downturn on the company’s future financial performance, company executives will have the opportunity plan ahead and start to address which revenue enhancement and/or cost reduction strategies are needed to get the magazine company’s financials back on track.

1. **Conclusions of the study**

**Result of the two scenarios**

A review of the magazine company’s financial performance shows that under scenario 1, the company maintains a reasonably steady annual net income in years 1 and 2. Net income increases from $3.7M in year 1 to $3.8M in year 2, which represents a 3% increase over the prior year. By year 3 however, the company’s net income decreases to $1.7M or 57% from the previous year. This is a result of the cumulative impact of having an unsold inventory rate of 10% per quarter.

When the company’s net margin is evaluated on a quarterly basis, we see that quarterly net margin increases from roughly $791K in the first quarter of year 1 to $1.8M during the second quarter of year 2. By the third quarter of year 3, net margin declines sharply to $238K and stays in the range of $233K to $522K between the last quarter of year 2 and the last quarter of year 3. See Chart1 of the appendix for a visual display of the company’s quarterly net margin under scenario 1.

In reviewing the income statement sheet of the model, it becomes evident that the sharp decline in the company’s net margin during the third quarter of year 2 is driven by increases in cost of goods sold and operating expenses while revenue remained flat. In year 2 for instance, revenue was constant at $15.5M each during the second and third quarter while cost of goods sold increased from $10.7M to $11.7M during that same time period. Operating expenses also increased from approximately $870K to $1M during that time frame.

In scenario 2, when the rate of unsold inventory increases to 15%, the impact on the net margin that we saw in scenario 1 is magnified. In comparing the two scenarios during year 2, we see that net margin starts to decline during the first quarter for scenario 2 whereas in scenario 1 we don’t see that decline until the second quarter. We also see that in scenario 2 annual net income is declining sharply over the 3 year period. A review of the income statement sheet for scenario 2 shows that annual net income decreased from $2.3M in year 1 to $851K in year 2 and to $230K by year 3. Chart 2 of the appendix shows the quarterly net margin under scenario 2.

**Recommendation**

Based on the outcome of the two scenarios above, we recommend that the magazine company review the costs associated with its retail and distribution inventory to find ways of lowering its cost of goods sold. While the company is off to a good start in year 1, the model shows that based on its current cost structure, the company is not able to maintain same level of net margin during years 2 and 3.

Another recommendation is that the company explore potential marketing strategies that will help increase its sales revenue, which in turn would decrease its rate of unsold inventory. The company should plan to set a target rate of 5% for its unsold inventory compared to the 10% unsold inventory rate it is currently experiencing. To that end, we recommend that company develop a marketing plan targeted specifically at increasing sales for its Sports and Fashion magazines.

Given that the company’s sales price for Sports and Fashion magazines are higher than that of its other newspaper and magazine offering, a marketing plan targeted at increasing sales in these two areas (Sports and Fashion) will help ensure that the additional revenue generated will be significantly enough to offset the marketing costs.

1. **Budget and schedule performance**

As a result of changing the focus of our project during the proposal process, we’ve had to revise our budget and schedule for the project. Details of the budget and schedule changes that were required are listed below.

**Schedule performance**

During the time of our proposal, we anticipated working on the project according to the following schedule and milestones:

* **Week of 10/19 –** Team prepares and submits project proposal.
* **Week of 11/2 –** Team revises proposal based on instructor feedback. Review model input, parameters and outputs to ensure the proposal requirements are being met.
* **Week of 11/9 –** Team resubmits project proposal. Assess progress to date, prepare and submit midpoint status report. This will help the team determine which areas need additional focus and adjust course as needed.
* **Week of 11/16** – Once the proposal is approved, team will begin to develop model and assign various components such as developing the input streams, creating the parameters and parameter blocks and model scenarios etc. to team members.
* **Week of 11/23** – Continue to refine the model and determine the framework and structure for the final product.
* **Week of 12/7** – Team will start to formulate a conclusion for the project and work on preparing the final report. Project Coordinator will work with the group to ensure all the report requirements are being met.
* **Week of 12/14** – Begin putting the user’s guide and reference guide.
* **Week of 1/04 –** Team meets to review the final product and make any necessary changes before the work is submitted for the 1/15/09 deadline.

As we started to refine our proposal and began to work on the project, our actual timeline needed to be adjusted as follows:

* **Oct 20 to Oct 22 –** Team prepares and submits project proposal.
* **Oct 30 to Nov 5 –** Team revises proposal based on instructor feedback. Review model input, parameters and outputs to ensure the proposal requirements are being met.
* **Nov 13 –** Team resubmits project proposal. Assess progress to date, prepare and submit midpoint status report. This will help the team determine which areas need additional focus and adjust course as needed.
* **Nov 20** – Proposal is approved and team begins begin to develop model and assign various components such as developing the input streams, creating the parameters and parameter blocks and model scenarios etc. to team members.
* **Nov 21 to Dec 12** – The initial model is developed. Team member takes a first pass at building the model.
* **Dec 22 to Jan 11** – Several iterations of the model are done and team continues to review and refine.
* **Jan 4 to Jan 11** – User and Reference guides are put together and reviewed by the team
* **Jan 5** – Begin putting together final report
* **Jan 12** – Several teams members meet in person to go over the excel model, user and reference guides preparing the final report.
* **Jan 14 –** Team reviews and refines final report
* **Jan 15** – Project materials (excel model, user guide, reference guide and final report are submitted in time for the project deadline).

**Budget**

Our budget during the initial proposal was as follows:

* Planning: 30 hours in total for the entire team (this includes the re-work of the Project Proposal)
* Modeling: 80 hours – this total is estimated and is for the entire team and this total may exceed 70 hours based on the complexity of the financial model
* Documents: 24 hours – this total for the entire team is estimated and may be over-budgeted if more work goes in to the planning/modeling phase
* Execution: 8 hours – this total is for the entire team and is a ballpark estimate which may require more time
* Total: 142 hours for the entire team – the hours per person will vary per section but should be approximately equal
* Note: each of the sections includes a 20% time contingency and then the hours are rounded up.

Actual hours spent on the project model was greater than expected due to the fact that the team had to revise its initial proposal and change the original objective of the project. Below is a summary of actual budget hours for the project:

* Planning: 50 hours in total for the entire team (this includes the re-work of the Project Proposal)
* Modeling: 120 hours – this total is estimated and is for the entire team and this total may exceed 70 hours based on the complexity of the financial model
* Documents: 40 hours – This total for the entire team.
* Execution: 30 hours – this total is for the entire team.
* Total: 240 hours for the entire team – the hours per person varied depending on the section assigned. For example, building the model required a lot more hours than anticipated.

1. **Lessons learned**

**Think the problem through during the proposal stage**

At the time of the initial project proposal, the team had a general concept of the basic problem we wanted to solve. However, we did not have a good enough framework in place to allow us to develop a dynamic model. As a result we had to revise our proposal to ensure that the model we planned to develop would indeed address our stated objective. To accomplish this, we needed to sketch out the model’s input streams, parameters and output streams to better understand how information should flow in the model and how the different components relate to each other. Once that process was completed, we had a good basis for starting to develop the model.

**Keep the model simple**

We initially proposed to develop a model that would help the company maximize profits based on different percentages between their retail and distribution operations. As we started to think this plan through, it was not clear to us whether this approach would provide the company with a dynamic model rather than a tool. We also wanted to keep the number of variables between the two scenarios small so as not to create an overly complicated model that would be difficult to develop and maintain. To that end, the team decide to focus instead on evaluating the company’s performance if there was a downturn in the economy. We assumed the company would have a higher rate of unsold inventory during a bad economy and decided to evaluate its financial performance based on this premise. This allowed us to keep the model simple while still providing the company with crucial financial information.

**Plan ahead - allow plenty of lead time**

Although we did build a 20% contingency in our budgeted hours for the project, actual total hours spent on the project was significantly more than anticipated due to several factors. We anticipated that building the model would take up a significant portion of the total project time but had not expected it to jump from 80 hours to 120 hours. Other components of the project such as the documentation, execution and testing of the model took more time than expected. Despite the fact that a 20% contingency was built into our budget, actual budget hours were much higher than planning to unexpected delays in getting the proposal approved, the amount of effort required to build actually build the model. This created a ripple effect on all the other components of the project.

**Expect to do many revisions**

Due to the fact team communication for the project was done primarily through email, we did not have many opportunities for all team members to discuss the various components of project in person as much as we would have liked. Although some team members met in person during the lab sessions, it was not possible for all members to meet to discuss the project and review the different pieces that were assigned to various members. As a result, most of the feedback and revisions for project were done via email which may have contributed to the increase in actual total hours spent on the project. A few team meeting sessions with all members present to discuss the overall approach to the project and review any materials may have saved us some time on the project. However, given everyone’s pressing work and school schedule it would have been very difficult for the group as a whole to meet often in person. Therefore communication via email was the next best alternative.

**Division of labor**

For purposes of expediency we decided to allocate building the model to two teams members, one member was responsible for the reference and user guides and another member focused on putting the final report together. While this approach allowed each member to focus on a specific component of the project, it also made a bit more challenging to think of the project as a whole. For example, while the two team members who put the model together spent a tremendous amount of time building the model and were very familiar with the ins and outs of the model, the other two team members had to spend some time getting familiar with the model before they could focus on putting together the user guide, reference guide and final report.

**Appendix**

**Chart 1 - Scenario 1 Net Margin**



**Chart 2 - Scenario 2 Net Margin**

