Project Name: SimulPro

**Sample Only**

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Document Title: Course Project Proposal

Revision Number: 1.0

SimulPro Team:

**1. Overview**

Many products and services have seasonal selling trends, and, as a result, periodic pricing. This dynamic pricing and uncertainty of the demand make decision-making of retailers of seasonal products or providers of seasonal services very complicated.

My hypothetical client is a retail store selling seasonal goods like clothes or shoes. However, to simplify the problem, I assume that the Store sells only one product (we can think about it as an aggregate product of all shoes or clothes types). Each month the Store buys a new model of the product from a Supplier. Each month the model gradually becomes obsolete, i.e. the demand on it falls and eventually reaches zero. The demand is uncertain and has a discrete probabilistic distribution estimated from the historical data. The Store prices each model according to its “age”, the older the model, the lower the price. So, in each particular month the Store sells simultaneously several models of different “ages”.

The Supplier sells only quantities determined in advance, for instance 100, 200 and 300 units. For simplicity, the Store can only order the same quantity each month (probably, required by contract).The question the Store management asks: What quantity of the new model should be ordered each month from the Supplier to maximize the Store’s profit?

To provide the answer I will model the store sales during a 12 months period and estimate the mean profit and its confidence interval for each possible order quantity. However, it is not enough to do that only once. As the store faces the uncertain demand, I have to make a simulation model with several iterations (replications) to make my final suggestion reliable. I will be able to estimate the exact number of the iterations needed only after the first run of the model, but from my experience, I predict it to be about 300 (it actually depends on the desired narrowness of the confidence interval). I took the ISMT E-135 Simulation for Managerial Decision-Making course last semester and know how to do such things.

My Simulation Project’s name will be SimulPro. The two scenarios will have different demand probabilities tables. Other inputs like possible order quantities, models’ costs, and pricing schedule will be the same for both scenarios. It will allow to demonstrate clearly the stochastic nature of the model and its usefulness for decision making under uncertainty.

**2. Budget**

|  |  |
| --- | --- |
| Task | Cost (in hours) |
| Planning Total | 9 |
| Problem Definition | 8 |
| Project Schedule | 1 |
| Modeling | 24 |
| Inputs sheet | 8 |
| One iteration model | 8 |
| Multiple iteration modeling | 8 |
| Documents | 32 |
| Project Proposal | 6 |
| Midpoint Status Report | 2 |
| Final Report | 8 |
| User Guide | 8 |
| Reference Guide | 8 |
| Execution | 10 |
| Application to different order quantities | 1 |
| Outputs representation | 8 |
| Creation of second scenario | 1 |
| Grand Total | 75 |

**3. Team**

I will be working on this project alone.

**4. Inputs, parameters, and outputs**

*Input Streams*

1. Product costs – the product will have different costs depending on season, as winter shoes or clothes are on average more expensive than summer ones.
2. Pricing schedule – price of the product according to its “age”. The price will be expressed in percentages of the product cost.
3. Demand Quantities – possible demand quantities corresponding to different probabilities (see *Parameters*) for each “age” of the product.
4. Random numbers generator – To simulate uncertainty I need random numbers, so I will generate a table of random numbers for 12 months and 500 iterations.

*Parameters*

1. Demand Probabilities – there will be several given probabilities the quantities demanded could have.
2. Order Quantities – there will be several possible order quantities, I will list them all on the Input worksheet and then, as professor Brenner suggests, I will create different worksheets where only one of each of these quantities will be used.

Note: These are not two parameters, but two types of parameters, there will be more than five parameters in the model.

*Output Streams*

1. Mean Profits – from all iterations for each month and for the entire year, and for each order quantity.
2. Standard deviations – the measure of spread of the profit.
3. 95% Confidence intervals – given uncertainty, each profit will most probably be in some interval.
4. **Schedule and milestones**

|  |  |  |
| --- | --- | --- |
|  | Date | Milestone |
| 1 | 10/5/2011 | Project Proposal |
| 2 | 10/11/2011 | Creation of Excel workbook template and Inputs sheet |
| 3 | 10/18/2011 | One iteration modeling; Excel additional capabilities Request |
| 4 | 10/25/2011 | Midpoint Status Report; Multiple iterations modeling |
| 5 | 11/1/2011 | Scenarios development; Outputs Sheet |
| 6 | 11/8/2011 | User Guide |
| 7 | 11/15/2011 | Reference Guide |
| 8 | 11/22/2011 | Final Revision of the Model and the Guides |
| 9 | 11/29/2011 | Final Report |
| 10 | 12/6/2011 | Entire Project review; Preparation of the package for the Projects Library |
| 11 | 12/13/2011 | Due Date |