

# I<sup>2</sup>PRO 319

## Decision Making Tool for Warehouse Logistics Pricing

### Project Plan

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in consultation with  
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**Sponsors** Warehouse Education and Research Council &

The Kern Family Foundation via the National  
Collegiate Inventors & Innovators Alliance

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**Illinois Institute of Technology**  
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## 1. Objectives

The IPRO 319 team's objective for this semester is to update and modify a model of a distribution operation which will aid companies seeking to outsource logistics operations. However, the team's main objective is to add a Request for Proposal tool to the existing model allowing companies to determine the effectiveness of outsourcing different aspects of warehouse operations. This team hopes to generate willingness in its members to establish an environment conducive to team-oriented goals, as outlined in the objectives below. Successful completion of the goals presented here will require each participant to gain useful experience and knowledge regarding teamwork, inter-professional skills and specifically warehouse logistics pricing. For the spring semester, the team has set forth the following objectives:

- Analyze existing model (Shipping, Manufacturing, Transportation, etc.) in terms of being user-friendly and effectiveness at accurately predicting cost versus revenue and whether the operations input should be outsourced.
- Refine the current model given the suggestions of a surveyed group, not differentiating the contributions of the IPRO students from the software users.
- Research costs associated with logistic processes.
- Develop a multi-purpose activity outsourcing tool for common use called "Request for Proposal".

## 2. Background

Presently in industry companies are finding it difficult to maximize their profit. One of the ways that is commonly used to maximize profit is determining the benefits of outsourcing distributional activities in operations. Many companies spend a great deal of time calculating financial figures to help determine if outsourcing certain logistics of their company can be beneficial. In an effort to help companies dealing with such issues the Warehousing Education and Research Council (WERC) has come up with a plan to develop a web based tool which will provide assistance to companies seeking to outsource logistics operations. WERC is an organization focused on warehouse management. Experts all over the country come together with the aim to improve individual and industry performance (see attachment for more information). In their efforts to create this tool, WERC has decided to sponsor the students of IPRO 319 in hopes that they can be successful in this endeavor.

Certain problems may arise before completion is possible. These problems include familiarization with the existing model in order to enhance it and creating a smooth transition from last year's IPRO to the current IPRO. In order to address these problems the team will utilize the existing excel model and will implement programming software like C#, .NET, and Java. Microsoft project will help the project run smoothly and stay organized, while Microsoft Word and Power Point will be used easily communicate our message to the sponsors.

The IPRO from last semester had great success in achieving their goals with the current model. With this model and any new models that are developed there are certain ethical and scientific issues that must be addressed. Privacy of the clients must be a key concern when developing the models. WERC and their personal security resources will provide much of the security for the model. It must also be noted that though computer calculations are important in deciding whether to outsource, there must still be a human interaction to include any non-numerical factors in the bids.

As the IPRO works through the semester, the team hopes to work through the steps of our process: define the type of industries that model can be used for, determine mathematical formulas and the creation of models needed to help in assisting the outsourcing decision-making

process, and finally organizing the information discovered into a presentation. Every step of the practical solutions will be followed by feedback from WERC representatives, which will help us to stay on track as well as assist us in making any changes in order to improve our development plan. When the final model is achieved the team will enter the development stage of the project. The construction of the Graphic User Interface (GUI) and the development environment it is written in (ASP, .NET, C #, Java) will be the determining factors of the end result of the project, the Outsourcing Tool.

This will be the second look at an outsourcing model and the team hopes to make the existing model better and to develop more tools to help companies in their outsourcing needs.

*Attachments - Information about the sponsors provided with the hard copy.*

### **3. Methodology/Brainstorming/Work Breakdown Structure**

#### **A. Defining the problems**

Finalizing and enhancing the model to include an outsourcing tool, that will be based on a Request For Proposal (RFP) form. Create an easy to use format for WERC members. This new and revised tool will allow the warehouses to:

- Calculate different costs: equipments, manpower, power requirements, tax structure, etc
- Calculate the cost effectiveness of outsourcing operations
- An effective tool that includes a RFP process and format
- Comprehensive view of all the costs associated with managing the warehouse

#### **B. Defining how the team will go about solving those problems**

##### *1. Understanding the requirements of the IPRO*

On February 13, 2007 the team met with an official from the Warehousing Education and Research Council (WERC), and discussed the objectives and execution of our model. During the meeting on February 13 the team received a look at the inner workings of WERC's operation. Additionally we established WERC's expectations for our new revised model.

##### *2. Initial Organization*

The team initially looked at the majors of everyone on the team and assigned roles to them according to the relevancy to their respective degrees. The team then formed 4 sub groups: Programming, Research, FAQ, and Request For Proposal. Each of the sub groups had a leader to ensure that everything progressed in a timely manner. The team assigned officer responsibilities such as appointing Project Leader, Minute taker, and Master scheduler on January 25, 2007. During the initial meetings the team defined the problem and how to approach it using various tools such as Microsoft Excel and C#. Along with these software needs, we identified the information necessary from warehouse business experts such as the protocol and uses of the RFP.

##### *3. Developing the project plan*

The team prepared a project plan/methodology to complete the pervious model and to add a RFP tool. We used MS Project, iGroups, and MS Word to organize the information

4. *Assigning individual team member to sub-groups and tasks*

Please refer to section 7 and section 8 for details

5. Warehouse visit

The tour is scheduled for February 16, 2007. The warehouse is owned by the Strive Group, whose mission is providing warehouse services and secondary packaging operations to the personal care product and food industries.

6. *Performing further research*

The team will perform research using industry journals, and data supplied by WERC.

7. *Performing analysis of information received*

Analyzing RFP forms and altering the model to allow easy integration of the RFP form into the current model.

8. *Review the progress*

The team will meet with WERC officials several times during the semester to assess the progress and get feedback about the work accomplished. The tool will be changed based on the feedback given by WERC as well as by other industry experts we will meet during this semester.

9. *Test the Product*

The team will send out a beta of the software to receive real world feedback on all the aspects of the program.

**C. Analysis**

The outcomes of the three processes will be assessed in the following terms:

- Modeling Process:

The existing cost model from 06' Fall I PRO 319 will be refined in many ways, ensuring more parameter inputs and more relevant informative outputs that describe the operation of the warehouse. A possible corroboration that the model does in fact reflect the reality of the warehouse operation could be obtained by feeding in the data from previous history and to see how the model's output matches the known data from history, in comparison to the output of the existing cost model.

- Instruction and Documentation Process:

The output will be compared to the instruction material from the 06' Fall I PRO 319. The usability or how helpful the output instructions are to the user will be determined by a group of users on a questionnaire composed of checklist, comment, and suggestion.

- Request for Proposal Process:

The relevant information to be mentioned in the Request for Proposal (RFP) form is to be matched to the RFP forms that were used in real situations.

**D. Documentation**

Each process groups will maintain a record of their respective goals, bench mark data, and specific questions that they should ask to test their output. The actual testing and result report could be performed by other peer process groups or a third party to minimize the biases in the analysis.

**E. Analysis of the expected results**

The expected results will be analyzed in two major ways:

1. How the results from using the program stack up to decisions made by warehouses when it came to structuring the costs for running a warehouse. By doing that, we should see how effective the model is in setting up the costs for a warehouse. Graphs and charts will be constructed to give an easy overview of the effectiveness of the model.
2. How the RFP form will stack up to constructed RFP forms made by warehouse companies. This will be done through using example data to construct the costs using the RFP form constructed this semester and the RFP forms created by warehouse companies. The results will then be compared and analysis in both word and picture form.

**F. Production of I PRO Deliverables**

The I PRO deliverables will be constructed in the following matter:

1. One important deliverable will be the actual program that was fine-tuned this semester.
2. Another important deliverable will be the FAQ documents detailing how to utilize the program so that a warehouse company could calculate the costs in an easy and user-friendly format. A chart of example values will be published along with the document for testing.
3. Also, a document comparing how the model compares to actual data from warehouse companies complete with data analysis will be produced.
4. Finally, a document detailing how the RFP process works and how a program should be constructed for next semester's I PRO. Along with that document will be the RFP form to be used for the next semester to create the code and programs of the RFP process.

**G. There are no documents that need to be attached**

#### 4. Expected Results

The goal of IPRO 319 is to produce a program that will help and ensure positive growth within the warehouse and its business endeavors. We will work closely with our sponsors and come up with a solution that best fits their needs with what we are capable to provide to benefit warehouse management.

The results that this IPRO will generate include building a user-friendly interface for the existing model, enhancing the previously created cost-based model, and develop a warehouse/distribution center activity outsourcing tool starting from the research and completing the model to make it fully available. After the described above research, IPRO 319 expects to receive a certain number of key metrics and formulas that deeply interfere with the warehouses' every day activities which allow the IPRO team to model warehouse/ distributional center operations and criteria that influence productivity and profitability of logistics.

Applied research and data gathered, such as industrial standards, criteria and financial values will also benefit to the enhancement of the current cost base model and its breakdown structure. Testing on the other hand, will allow us to work with industries and quickly identify issues and required modification based on the real time working activities of warehouse companies and their current values/reports. All gathered comments and suggestions will benefit to the improvement of the model and strengthen its close-to-reality (market) value and therefore increase its usefulness.

The model will be finalized in coding, and with a generated FAQ of the existing model, will allow the programming of the model to be easier to utilize as a warehouse management tool. This IPRO project will also formulate an outline of an outsourcing tool which will be implemented with the current cost structure based model.

The programming team will be improving the existing model with the developed user-friendly interface for the model, FAQ, and description of the key metrics. The developing team will also collect data from the existing model to assist the programming team. The Request for Proposal tool will create the outline for the outsourcing tool. The expected deliverables that we are planning to receive are first of all an improved model consisting of a number of spreadsheets and word documents which will simulate warehouse/distribution centers' activities, costs, and structure. Apart from that, IPRO 319 is expected to produce a web-based tool to represent the model and make it available to a number of beneficiaries.

All information gathered in the research phase will be also available for potential customers. With the successful completion of the mentioned above activities and results from them IPRO 319 will be proud to benefit the warehouse/distribution industries

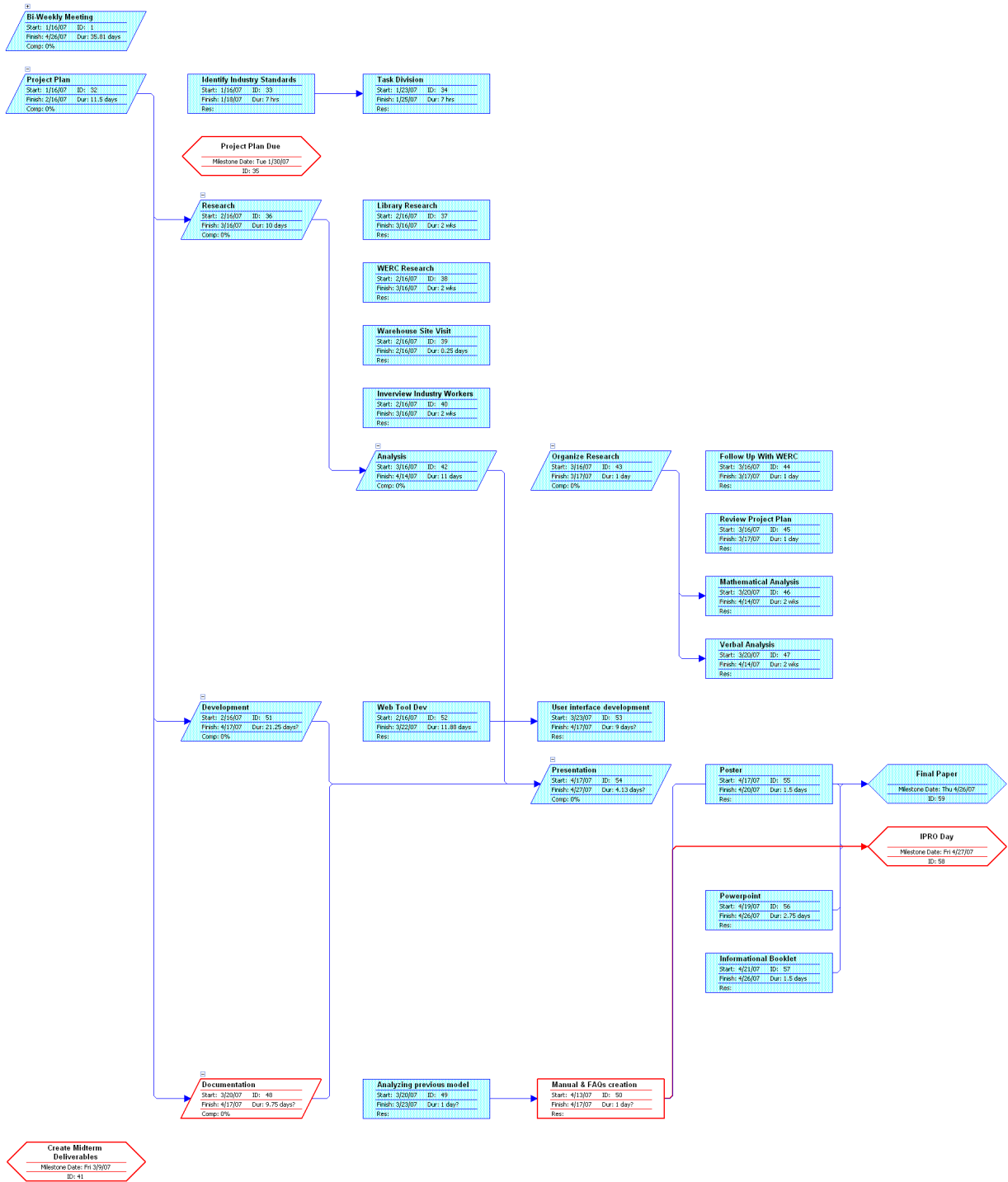
#### 5. Budget

IPRO Day	\$300.00
Miscellaneous	\$200.00
Transportation	\$100.00
<b>TOTAL</b>	<b>\$600.00</b>

## 6. Schedule of Tasks and Milestone Events

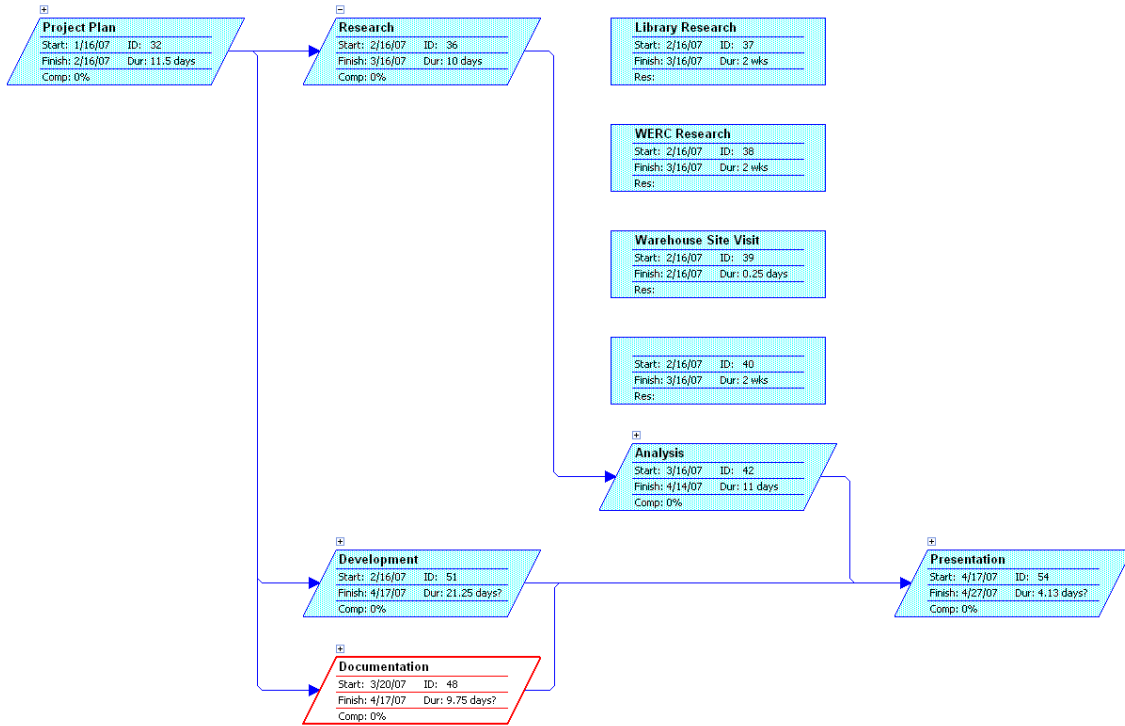
Refer to the following page for the workflow chart.

### Overall

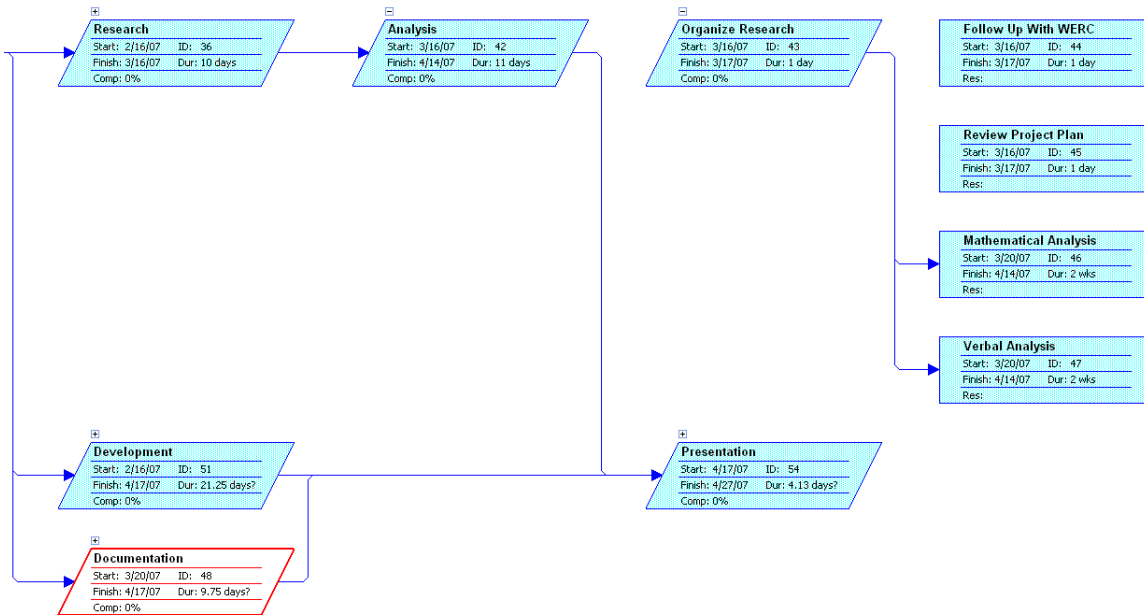


Detailed description per groups.

**Research**

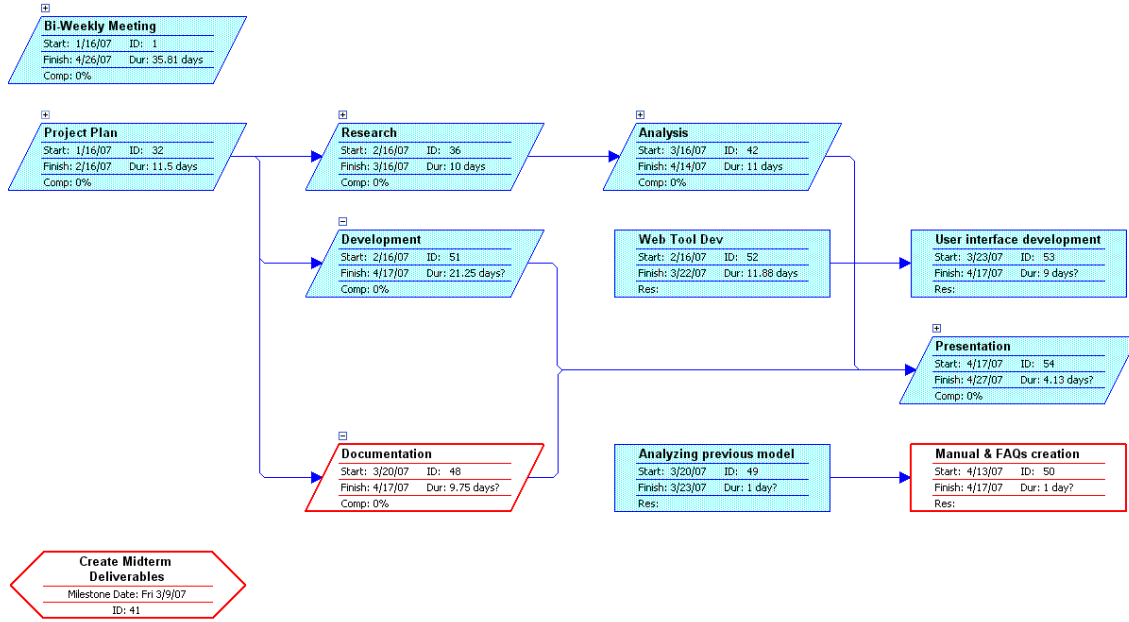


**Analysis**

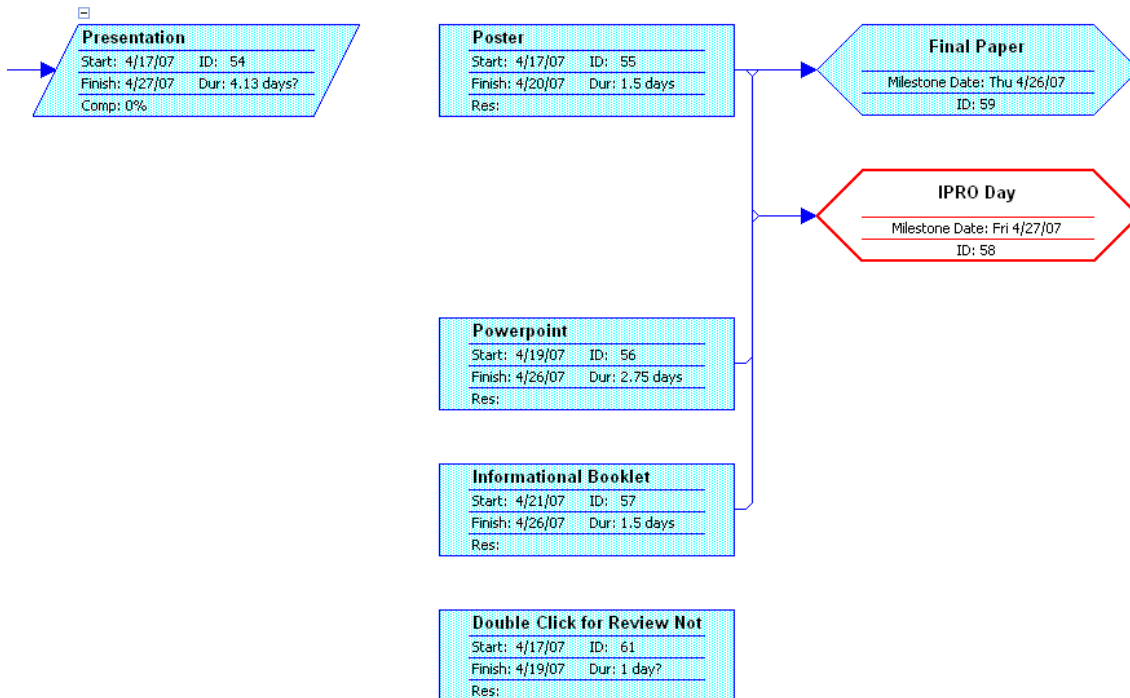




### Development



### Presentation



Detailed information available upon request

## 7. Individual Team Member Assignments

### 7.1 Overview

Name	Role	Major	Other
Khanh Duong	Time keeper	CPE	
Uchenna Egwu		ME	
Justin Ma		AE	
Arthur Mcanally		CS	
Kristin Mrozinski		ARCH	
Douglas Oh		EMGT	
Nickolay Schwarz	Team leader, Master scheduler	CS	IPRO-experience
Sarah Stone	Secretary , Weekly Timesheet Collector/Summarizer, Minute taker	PPPS	Warehouse experience
Aleksandar Sudar	Team leader (assistant)	CHE	
Hee Jeoung Yu		CPE	
Arthur Zavala	Agenda Maker	PHYS	IPRO-experience
Shields, Herb	Professor	Professor	

### 7.2 Sub-teams

<b>Development (programming) Team</b>		
Develop the online tool based on web technology.		
Name	Role	Responsibilities
Schwarz, Nickolay Khanh Duong Arthur Mcanally	Sub-team leader	Overall Design and backend development Design and backend development

<b>FAQ Developing Group</b>		
Modify and improve existing model, develop manual of how to use it.		
Name	Role	Responsibilities
Sarah Stone Douglas Oh Hee Jeoung Yu Kristin Mrozinski	Sub-team leader	Overall Model improvement Model improvement Manual development

<b>Request for Proposal Team</b>		
Responsible for the development of multi-purpose pricing based outsourcing tool		
<b>Name</b>	<b>Role</b>	<b>Responsibilities</b>
Justin Ma	Sub-team leader	Overall
Uchenna Egwu		Tool development
Aleksandar Sudar		Tool development
Arthur Zavala		Pricing research

## 8. Designation of Roles

*Team Leader:*

**Nickolay Schwarz**

*Assistant Team Leader:*

**Aleksandar Sudar**

*Minute Taker:*

**Sarah Stone**

In charge of recording decisions made during meetings including task assignments or changes under consideration.

*Agenda Maker:*

**Arthur Zavala**

Responsible for creating an agenda for each team meeting. This provides structure to the meetings and offers a productive environment.

*Time Keeper:*

**Khanh Duong**

Responsible for making sure meetings go according to agendas.

*Weekly Timesheet Collector/Summarizer:*

**Sarah Stone**

Responsible for collecting weekly timesheets from each member of the team and updating everyone with a summary report.

*Master Schedule Maker:*

**Nickolay Schwarz**

Responsible for collecting schedules from all the team members and developing a master schedule, which tells the team when members are available and how to contact them.