

**Team Number**

Team - 11

**Client**

Van Gorp Corporation

**Advisers**

Prof. Ahmed Kamal

**Team Members/Roles**

Rushabh: Team Leader

Jonathan: Team Communication Leader

Chao: Team Webmaster

Yuxiang: Team Key Concept Holder

Rob: Team Key Concept Holder

Chenfeng: Team Key Concept Holder

**Team Email**

may1711@iastate.edu

**Team Website**

<http://may1711.sd.ece.iastate.edu>

<https://may1711.sd.ece.iastate.edu>

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Date - 1.0

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# 1 Introduction

## 1.1 PROJECT STATEMENT

Explain what the project is about. What are you trying to do?

Van Gorp Corporation is an Iowa based company that manufactures standard and customized pulley systems for clients. Since each pulley system they build must be specifically designed per customer, the price, including materials and labor, is different for each order. Currently, Van Gorp receives the specifications for each part, then must manually input the specifications into a complicated Excel spreadsheet that will output the quote for the parts. Since Van Gorp does not have any dedicated software developers, they have tried to build a simple application in MS Visual Basic to simplify the process, but would rather have actual developers build the application for them. The idea behind the project is to build a software application that will eliminate the current Excel driven system as well as integrate Van Gorp's current SQL database in order to quickly create, edit, and export quotations for the specific parts they are given the specifications of.

## 1.2 PURPOSE

Explain what is driving this project. Why is this work of benefit to the society?

The purpose of this project is to develop a standalone application to be used internally at Van Gorp to quickly quote a price on a part from their catalog when given specifications. The current method used to quote prices is a complex combination of Excel spreadsheets that negatively impacts the efficiency of the employees that are required to use them. With the final product of the application, the process for quoting a price will be streamlined, more user-friendly, and will improve the efficiency of the process for Van Gorp employees.

## 1.3 GOALS

- Improve our current programming skills
- Learn/apply project design/development practices
- Build an application that will benefit Van Gorp

## 2 Deliverables

These tie in with the goals. What deliverables are necessary to meet the goals outlined in the introduction?

Our deliverables will include a standalone desktop software built in C# running on .NET framework. Our application will replace their existing excel sheets used to generate quotes for various products. Our software will integrate equations and configurations used to generate a quote for standard product and allow inputs those that need customizations. We will have User Interface built from scratch that will be in accordance with the requirements. We are

Our software will also communicate with a remote database; given we can obtain enough access. Our deliverable will include additional database schema that will be used to add, update and retrieve previous quotes. Software will also provide an interface for Client to add, update and remove any records as they see fit.

## 3 Design

### 3.1 PREVIOUS WORK/LITERATURE

VanGorp has a collection of Excel Spreadsheets that are currently being used to generate quotes. These spreadsheets will be used as the basis for the design of this system.

VanGorp has a product catalog detailing the different products VanGorp manufactures. This product catalog can be used to help with visualizing each product as a quote is attempted to be produced for that product.

### 3.2 PROPOSED SYSTEM BLOCK DIAGRAM

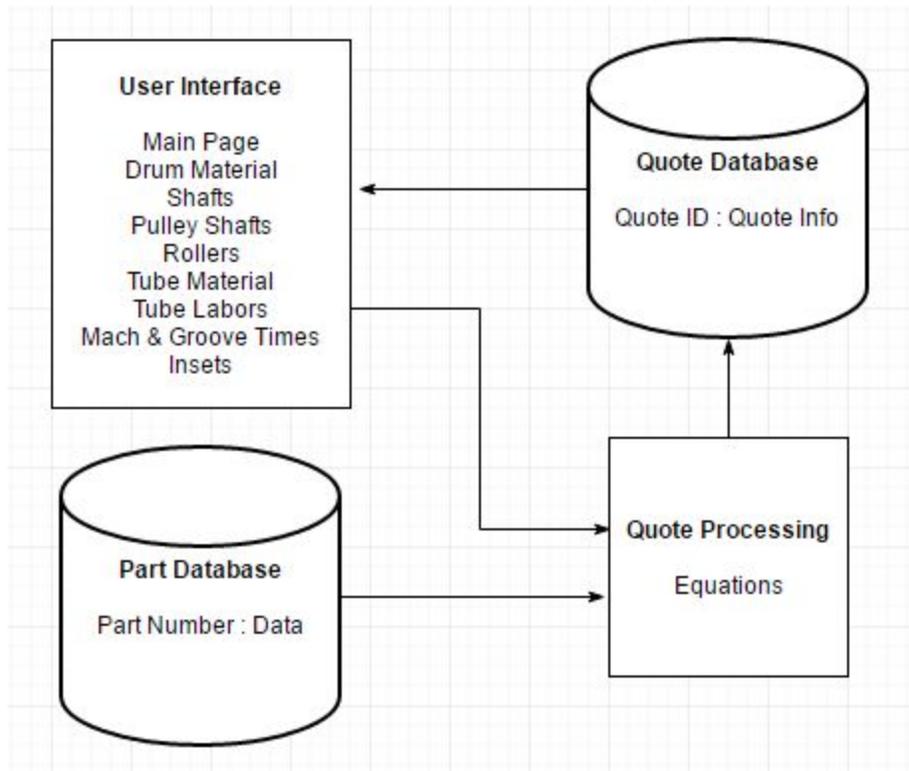


Fig. 1

Figure 1 displays the proposed system block diagram for this system. The main component will be the user interface, which will allow the user to enter inputs for each component of the quote. The user interface is connected to the Quote Processing module, as after inputs are entered, the system will compute a quote by retrieving part price information from the Part database. After calculation, the quote is stored in the Quote Database for retrieval by the User Interface.

### 3.3 ASSESSMENT OF PROPOSED METHODS

One potential approach that could be applied to this project is to develop an application written in C# under the .NET framework to act as an interface to the Excel sheet, making it easier to enter data into the quote spreadsheet. This approach may be easier for developers because they will not need to spend time learning how the quote spreadsheets work. However, this is not a good long-term approach because the goal is to eliminate Excel dependency.

Therefore, the approach that will be taken in this project is to extract all the equations and calculations from the quote Excel sheet and then create a standalone C# application that provides the same functionality of the spreadsheet by using the equations extracted

from the quote spreadsheet. The current spreadsheet system references other spreadsheets to retrieve part prices via product number; this C# application will access the part number database to retrieve that information, rather than rely on spreadsheets, thus eliminating Excel dependency.

### 3.4 VALIDATION

An exhaustive validation process will be designed and implemented during a testing period such that all possible combinations of quote inputs are tested for and validated. This process will include entering a combination of inputs into the quote spreadsheets and into the created application and verifying that the generated quote is the same.

## 4 Project Requirements/Specifications

### 4.1 FUNCTIONAL

1. Calculate quote with given inputs for a specific product (main functional requirement)

The basic scenario that how Van Corp would produce a product quote for their customer could be:

A customer orders a specific product from them, and the customer expects to get the quote for their order as soon as possible. In this case, the Van Corp company needs to first, analyze the order, check how much each kind of raw material this order will consume, and calculate the cost; Second, they need to figure out how much labor work this order includes, and then calculate the cost for labors; Finally, they include some other minor costs and sum up the numbers to get the total cost for their customer. The calculation for the product quote involves too many inputs, so they expect the software that we are going to build can make this calculating process much easier.

2. Windows platform based, and C# preferred for their convenience to maintain this software

Since nearly all available computers in Van Corp is running on windows OS, they expect a windows based application to use. In addition, the software maintainer in Van Corp prefers the software is built in C#, so he can add new features or fix bugs when it's needed.

3. Database connection

They will also need to manipulate data from SQL database, so to get access to SQL database, as a feature in our software is required.

## 4.2 NON-FUNCTIONAL

### 1. User-friendly

The major reason that they are so eagerly to get rid of those Excel sheets (they used to use them for calculating product quote) is they are too hard to use. So to be user-friendly should be the first goal of this software. This includes easy to get input, now matter from keyboard or database; easy to switch between different parts (some product includes many different parts); and beautifully show up the final result (a summation with a total cost) for the user.

### 2. Good speed performance (calculating quote and accessing data in database)

Generally, the quote can be calculated with inputs running through a series of formulas. We'd like to get the final result for the user as soon as possible. Also, good performance to access database/manipulate data in database is one of our goals.

## 5 Challenges

There are several challenges throughout the development of this project. Essentially, the challenges are categorized in three types. The first type of challenges is potential risk, which means there is a possibility, such as the possibility of losing team members, which will cause the project to fail to accomplish certain sub-goals. Secondly, it is also critical to consider if the sub-goals are feasible. Last but not least, both time and resource costs, such as software testing equipment and common available time are potential challenges.

### **Feasibility Assessment:**

#### Feasibility of Extracting Equations from Provided Excel Sheets:

One of the project tasks is to calculate the material cost and labor cost of a quote provided by a client. A software program with GUI interface will be implemented to perform such calculations. In order to accomplish this task, VanGorp will provide all the equations extracted from Excel sheets, which have been utilized as substitutes in generating quotes. The process of implementing the equations into software programs is going to be time consuming, due to the large amount of equations; however, this is achievable since equations are given, and reading the equations requires neither advanced math skill nor comprehension of those equations.

#### Feasibility of Debugging the Correctness of the Equations:

If we implement our quick quote program in a “Model, View, Controller” design pattern, and from the MVC point of view, the equations, which are used to calculate various costs and labor time, are a part of the model of this software program. The correctness, accuracy, and the performance need to be tested by ourselves. One of the

ways is to write test programs which take a set of inputs from the tester, then insert into both the excel sheet and the quick quote program to get the outputs. We can later compare the two sets of outputs in order determine the correctness and accuracy of our program.

Feasibility of creating and managing a database:

At this point of time, the feasibility of creating and managing a database, which is used to store quotes from the clients, is uncertain. The VanGorp Company is currently contracting a third party company to develop and manage their database. Credentials from the third party company are necessary to create and access VanGorp's database.

**Risks:**

Debugging risk:

There still are potential risks after implemented the quick quote program. The debugging risk arises from the fact that the quick quote program is going to be tested by team members instead of by the VanGorp Company. Both considerations of all possibilities of test cases, and software isolations are needed to debug, for that VanGorp Company may add new modules to the quick quote program.

Losing team members risk:

It is possible in the next semester, some team members may have to leave the team due to seeking personal job opportunities. If this happens, workload needs to be redistributed, and timeline may also need to be extended if necessary.

**Cost Considerations**

Time Cost:

This project will certainly be time consuming. Please review the timeline section for more details.

Resource Cost:

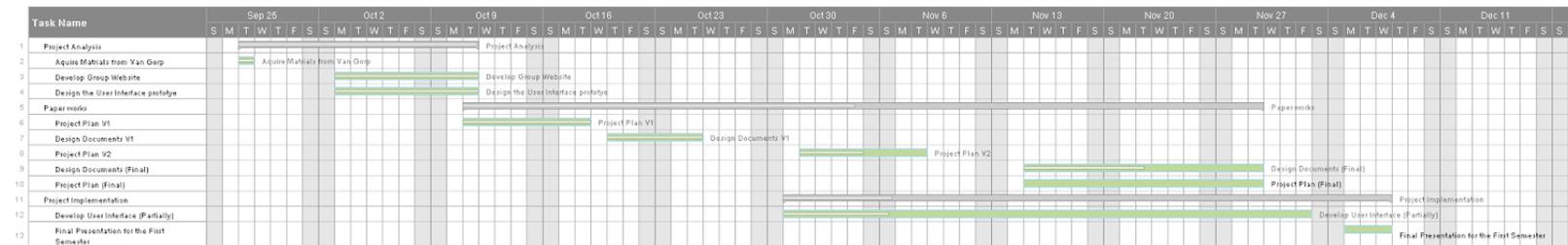
There are mainly two resource costs. Firstly, since the entire quick quote program is designed to run on corporate computers, high performance computers are not necessary to be used to implement this project. Second, since this is a team project, there will be costs of finding a common available time for team meetings.

# 6 Timeline

You may want to include a Gantt chart/something similar to help visualize your timeline to complete the project.

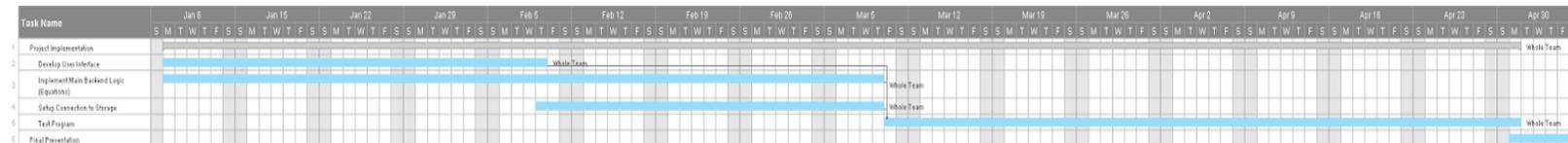
## 6.1 FIRST SEMESTER

Task Name	Start Date	End Date	Duration	Hours (Up to Now)	Hours (Estimate)	% Complete	Status	Assigned To	Comments
<b>Project Analysis</b>	09/27/16	11/30/16	47d	49	49	100%	In Progress		
Acquire Materials from Van Gorp	09/27/16	09/27/16	1d	33	33	100%	Completed	Whole Team	
Develop Group Website	10/03/16	10/11/16	7d	12	12	100%	Completed	Chao Song	
Design the User Interface prototype	10/03/16	10/11/16	7d	4	4	100%	Completed	Robert Hansen, Jonathan Schmidt	
<b>Paper works</b>	10/11/16	11/29/16	36d	57	75	62%	In Progress		
Project Plan V1	10/11/16	10/18/16	6d	18	18	100%	Completed	Whole Team	Intro - Rob Design - Jon Requirements - Chao Timeline - Yuxiang Challenges - CF Deliverables - Rushabh
Design Documents V1	10/20/16	10/25/16	4d	15	15	100%	Completed	Whole Team	Proposed Design Method - Jon Design Analysis - CF Interface Specification - Rushabh Hardware / Software - Yuxiang Process - Robert
Project Plan V2	11/01/16	11/08/16	6d	12	15	80%	Not Started	Whole Team	Intro - Rob Design - Jon Requirements - Chao Timeline - Yuxiang Challenges - CF Deliverables - Rushabh
Design Documents (Final)	11/15/16	11/29/16	11d	12	15	80%	Not Started	Whole Team	Proposed Design Method - Jon Design Analysis - CF Interface Specification - Rushabh Hardware / Software - Yuxiang Process - Robert
Project Plan (Final)	11/15/16	11/29/16	11d	0	12	0%	Not Started	Whole Team	Intro - Rob Design - Jon Requirements - Chao Timeline - Yuxiang Challenges - CF Deliverables - Rushabh
<b>Project Implementation</b>	10/31/16	12/07/16	28d	22	115	18%	In Progress		
Develop User Interface (Partially)	10/31/16	12/02/16	25d	22	110	20%	In Progress	Rushabh Shah, Chao Song	
Final Presentation for the First Semester	12/05/16	12/07/16	3d	0	5	0%	Not Started	Whole Team	



## 6.2 SECOND SEMESTER

Task Name	Duration	Start	Finish	Prede	Assigned To	% Complete	Status	Hours
<b>Project Implementation</b>	81d	01/09/17	05/01/17		Whole Team	0%	Not Started	610
Develop User Interface	24d	01/09/17	02/09/17		Whole Team	0%	Not Started	110
Implement Main Backend Logic (Equations)	44d	01/09/17	03/09/17		Whole Team	0%	Not Started	200
Setup Connection to Storage	21d	02/09/17	03/09/17		Whole Team	0%	Not Started	100
Test Program	37d	03/10/17	05/01/17	4, 3, 2	Whole Team	0%	Not Started	200
<b>Final Presentation</b>	5d	05/01/17	05/05/17		Whole Team	0%	Not Started	20



## 7 Conclusions

Sum up your project plan. Briefly re-iterate your goals for the project and the plan your team has put in place to achieve these goals.

## 8 References

List all the sources you used in understanding your project statement, defining your goals and your system design. This report will help you collect all the useful sources together so you can go back and use them when you need them.

## 9 Appendices

If you have any large graphs, tables, or similar that does not directly pertain to the problem but helps support it, include that here. You may also include your Gantt chart over here.