Quick Quote

Group May-1711

Van Gorp®

Engineered Conveyor Components

- Client: VanGorp
- Located in Pella, IA
- Manufacturer of Conveyor/Pulley Components

Project Scope

- VanGorp handles many different part orders every day
  - Customers request specific dimensions of each part to fit their needs

- Each order must be custom quoted to generate an estimated price

- VanGorp currently uses Excel to generate quotes
  - Multiple Excel Spreadsheets get complicated
  - Inefficient and time consuming

Example: Section of Current Quote Excel System

	A	B	C	D	E	F	G	H
1	Quote #							
2	Item #							
3								
4		Rim Data			End Disk Data			Center Disk Data
5	Diameter	24						
6	Face	44						
7								
8	Sq. Inches	4587		Sq Inches Per ED	720		Sq. Inches Per CD	720
9		NSD		Total ED Sq Inches	1440		Total ED Sq Inches	720
10	Material			Material			Material	
11	Rim Thickness	0.375		ED Thickness	0.3125		CD Thickness	0.25
12				# of ED	2		# of CD	1
13								
14	Sq. Inch Cost	$ 0.036		Sq. Inch Cost	$ 0.030		Sq. Inch Cost	$ 0.024
15		9000068			9000050			9000043
16	Rim Cost	$ 166.96		Total ED Cost	$ 43.63		Total CD Cost	$ 17.42
17	Surcharge	$ -		Surcharge	$ -		Surcharge	$ -
18	Total Pulley Wt#	460.50	lbs	Labor Part Desc	NSD24C44XT3(	Overide	Adders:	Static Balance
19	Total Labor Min.	#N/A		Pulley Labor Min	#N/A			Stress Relieve
20	Total Labor Cost	#N/A		Mach Lab Min	0.00			MT Hub Weld (Weld in Only)
21	Total Mat'l Cost	$ 249.50		#N/A	Surcharge		Print	MT ED Weld (Weld in/Profile Only
22	Total Cost	#N/A		#N/A	Cost W Surcharge			UT Seam (All)
23								
24								(UT Seam includes UT of Plate, Welds Finished Welds)
25								Total NDT Labor
26								
27	Temporary tables to be replaced by data tables				Still need to add stretch length to calculation to rim material.			
28				Cost	XTH25/10 AND 12, AND XTH30/8-UH ADDED 10.08.13-EZ			
29	Part number	Plate thickness		as 02/04			Part number	Hub
30	9000035	0.1875	1	$0.018	0.1875	1	1068089	XTH15
31	9000043	0.25	2	$0.024	0.25	2	1068097	XTH20
32	9000050	0.3125	3	$0.030	0.3125	3	1068105	XTH25
33	9000068	0.375	4	$0.036	0.375	4	1068113	XTH30

- **Hard to understand**
  - Especially for new employees
- **No database usage**
  - Necessary info pulled from other Excel pages instead
- **Repeated Work**
  - Duplicate parts in a quote equals repeated work
- **Time Consuming**
  - Simple quotes take hours, complex quotes could take a whole day

Goal of Quick Quote

- **Create one easy-to-use software package**
  - Condense multiple excel spreadsheets into one program
  - More User-Friendly experience

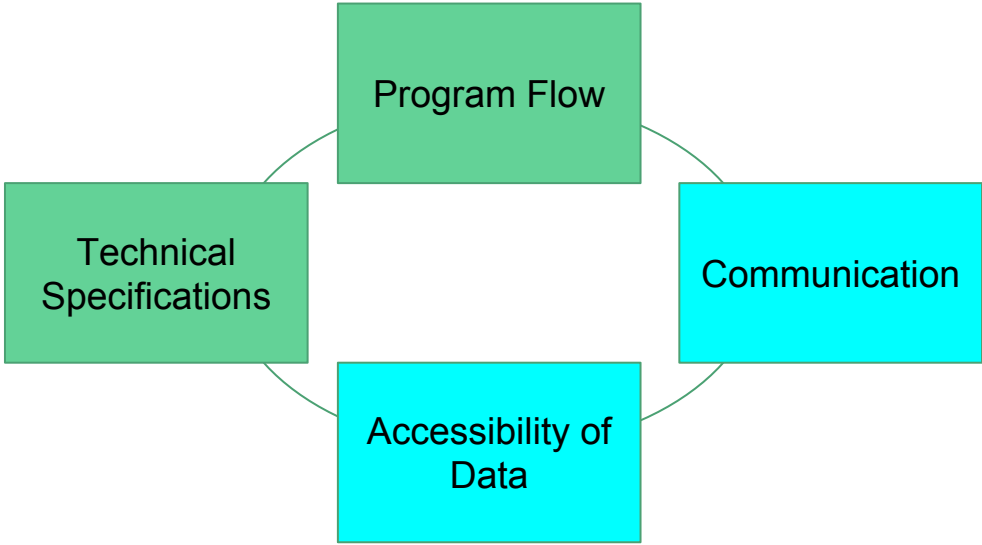
- **Simplify Quoting Process**
  - Allow similar components to be duplicated
  - Save Quotes for later use

- **Save time**
  - Easier for new employees to learn quoting methods
  - Achieving the above goals will speed up the Quoting Process

Issues

- **Insufficient communication**
  - Database access
  - Loss of contacts
  - Requirements

- **Unstructured - Incomplete data**
  - Equations
  - Excel data



Process of Design

- **Programming Language**
  - Chose C# as the primary language for two reasons.
    - Van Gorp uses Windows as its primary operating system.
    - C# is the language that Van Gorp’s technicians are most familiar with.
- **Data Storage**
  - Excel is the main storage of data.
    - Van Gorp’s database is not accessible, because of the fact that its database is maintained by a third party company.
    - The data used by the Quick Quote Program is subject to future changes. Van Gorp’s technicians can update Excel sheets easily, when needed.

Data Storage

	A	B	C	D	E	F	G	H	I	J
1	**Inset**			**Bevel Check**						
2	**Hub**	**End Disk (in)**	**Hub (in)**	Hub	thickness_0	thickness_1	bevel_1	thickness_2	bevel_2	
3	XTH15F4	1.25	1.25	XT15	5/16	none	none	none	none	
4	XTH15F5	1.25	1.25	XT20	3/8	none	none	none	none	
5	XTH15F6	1.25	1.25	XT25	1/2	none	none	none	none	
6	XTH15F8	1.25	1.25	XT30	1/2	5/8	3/16	none	none	
7	XTH20F5	1.25	1.25	XT35	5/8	3/4	1/4	none	none	
8	XTH20F6	1.25	1.25	XT40	3/4	7/8	16-Mar	1 3/8	3/8	
9	XTH20F8	1.25	1.25	XT45	1 ---- no bevel	1/14	7/16			
10	XTH20F10	1.25	1.25	XT50	1 1/4 ---- no bevel					
11	XTH20F12	1.25	1.25		1 3/8 ---- 3/8x45 bevel					

Initial Inputs | Standard Variables | Machine Variables | **Hub & E.D. Insets** | Pulley Standards | Lagging Time

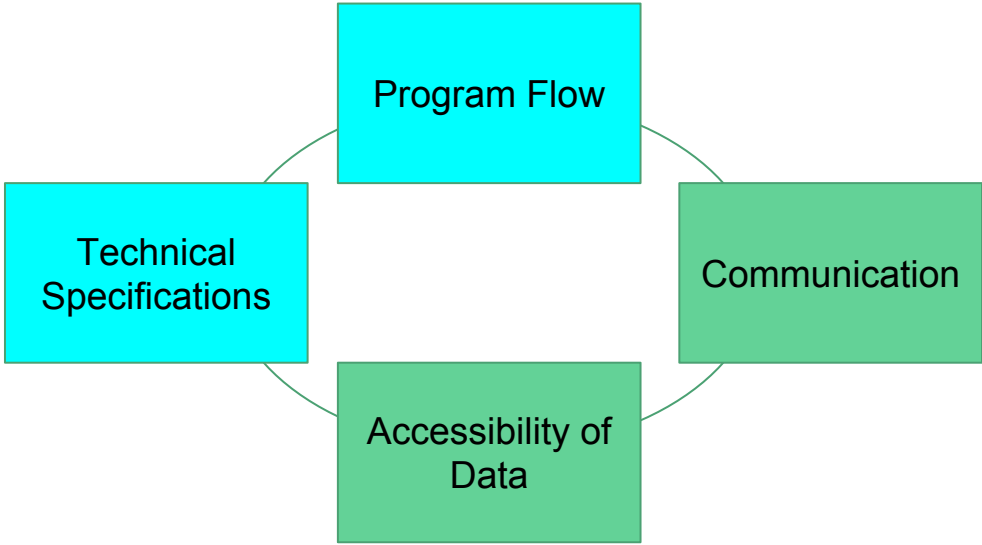
Process of Design

- **Windows Presentation Foundation (WPF) over Windows Form Library**
  - Easy to make the UI by coding. WPF is written by XAML which is similar to XML. Most of our teammates have experience with XML.
  - Easy data binding. Very easy for linking front end UI to backend logic.
  - Uses hardware acceleration for drawing the GUI, for better performance.

Obstacles

- **Quote process**
  - Different types of quotes

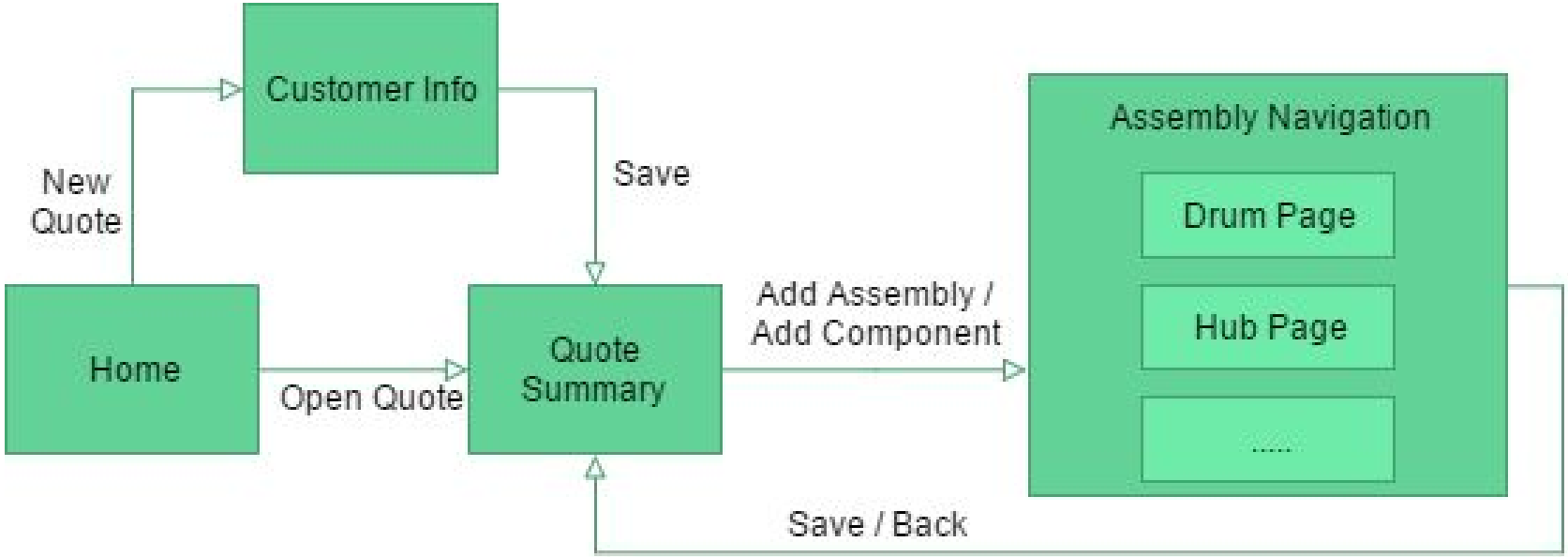
- **Effects on development**
  - Slightly lower pace of production



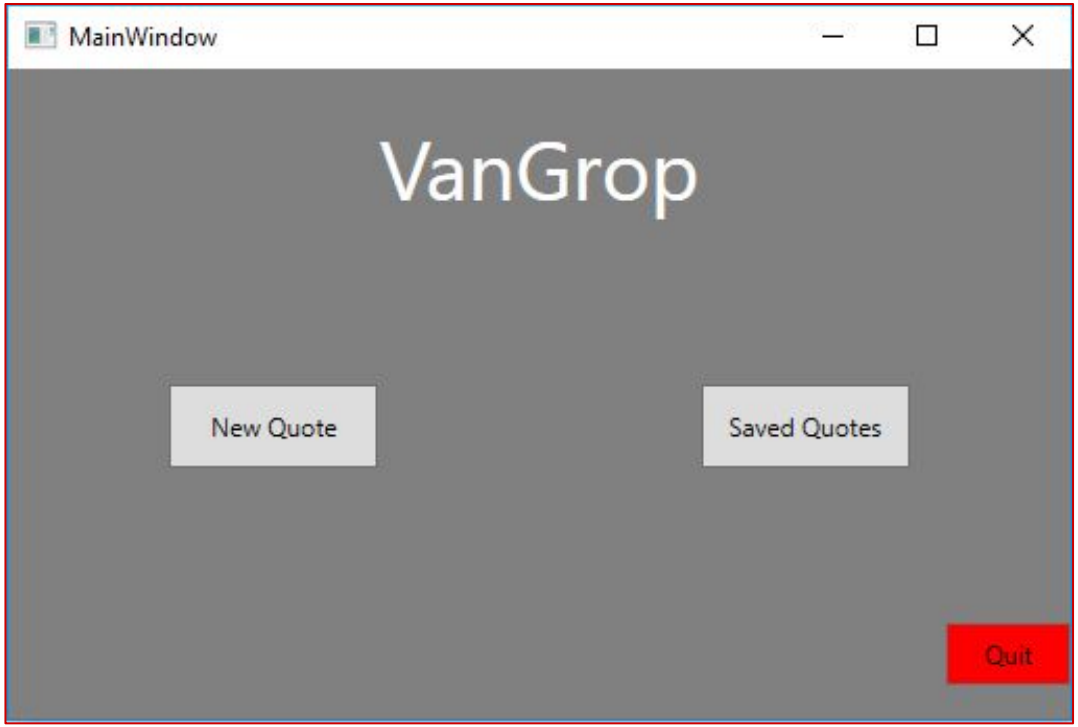
GUI design decision

- **Flexibility**
  - Won’t lose data when go back or forward from page to page
  - Add or remove a mechanical part quote into the main quote easily
  - The final quote (summary) should be sensitive to every bit of change related to weight and price
- **Simple and extremely easy to use**
  - The intended user of our program don’t have very much experience with computer programs
  - PCs that the intended user is going to use are kind of out of date. We don’t want the GUI part to cause too much burden to the PC. (So that Gui would freeze the running PC from time to time).

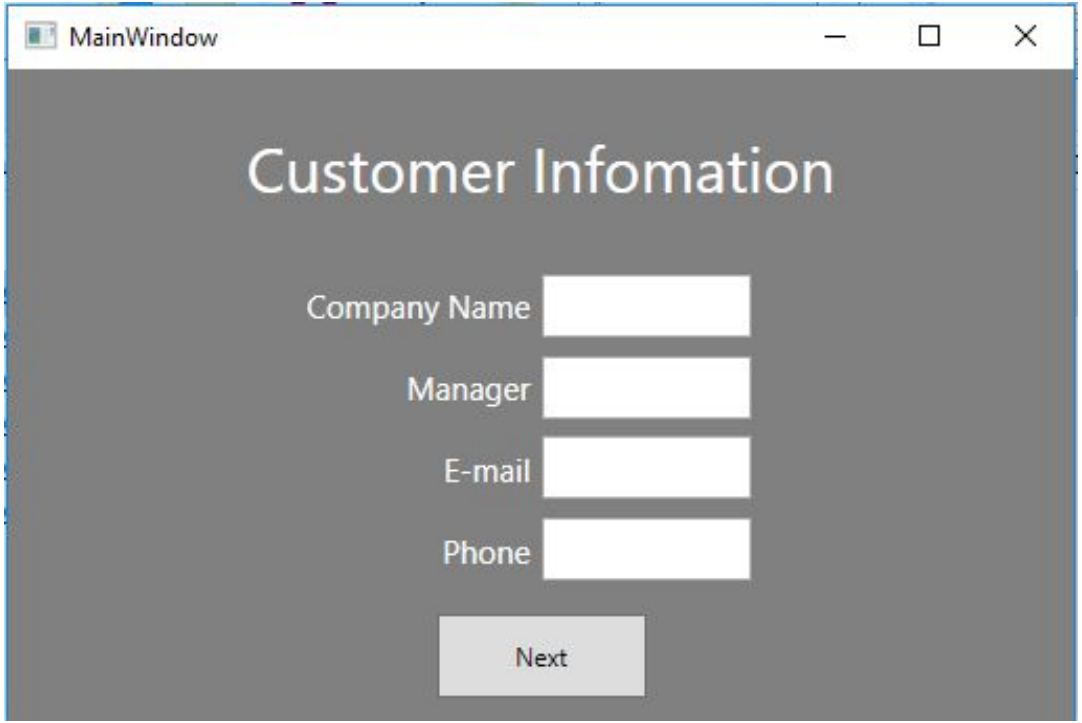
Current Design - GUI Flowchart



GUI design decision - first try: main window



GUI design decision - first try: customer info page



Enter customer information before starting to make quote.

This information will:

- **be stored in the database and**
- **show up in the main data entry page as a reference**

GUI design decision - first try: data entry page

MainWindow

Order Details

Customer Infomation

Name

SomeCompanyName

Manager

Chao Song

Email

chaos@iastate.edu

Phone

515-7081284

Customer information panel

Components

Total

Summaries for each component will be listed here row by row

This panel used to show the final quote summary including total weight and total price

Click AddNewPart button to add a new component from a pop-up window

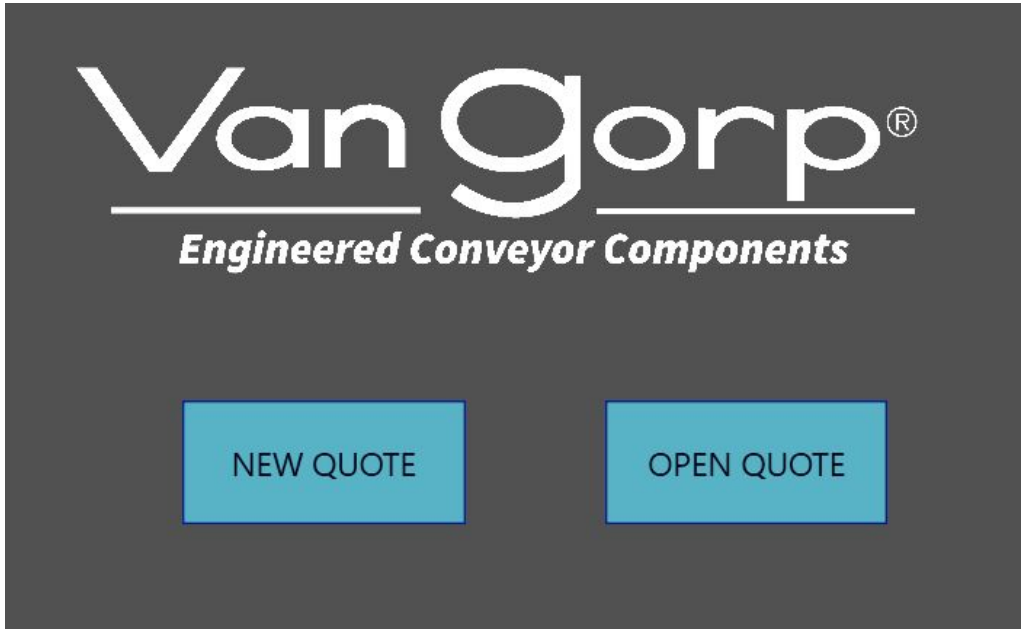
Other function buttons

AddNewPart | Save | Print | other1 | other2

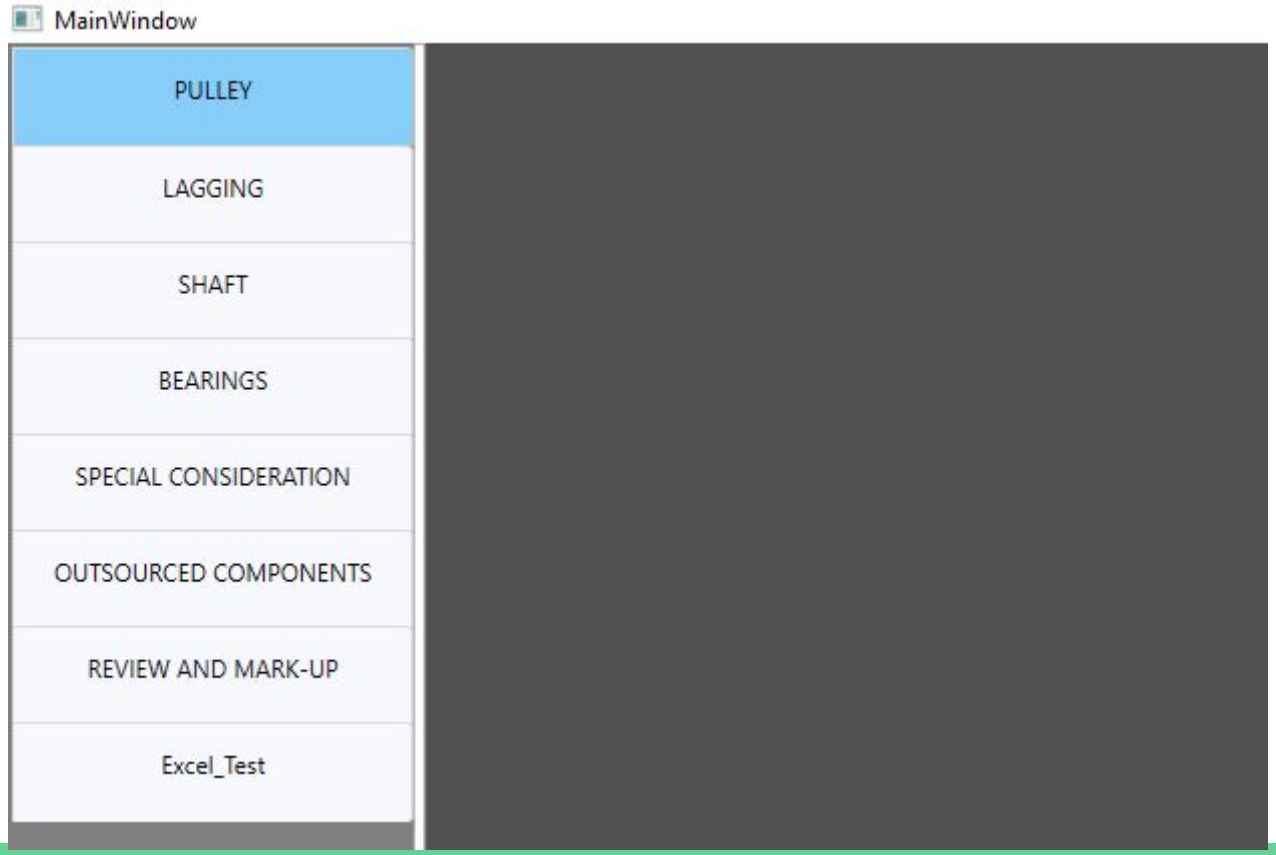
GUI design decision - first try: problems

- No hierarchy view of all the components that a user can add
- Not easy to edit component values and navigate between different components

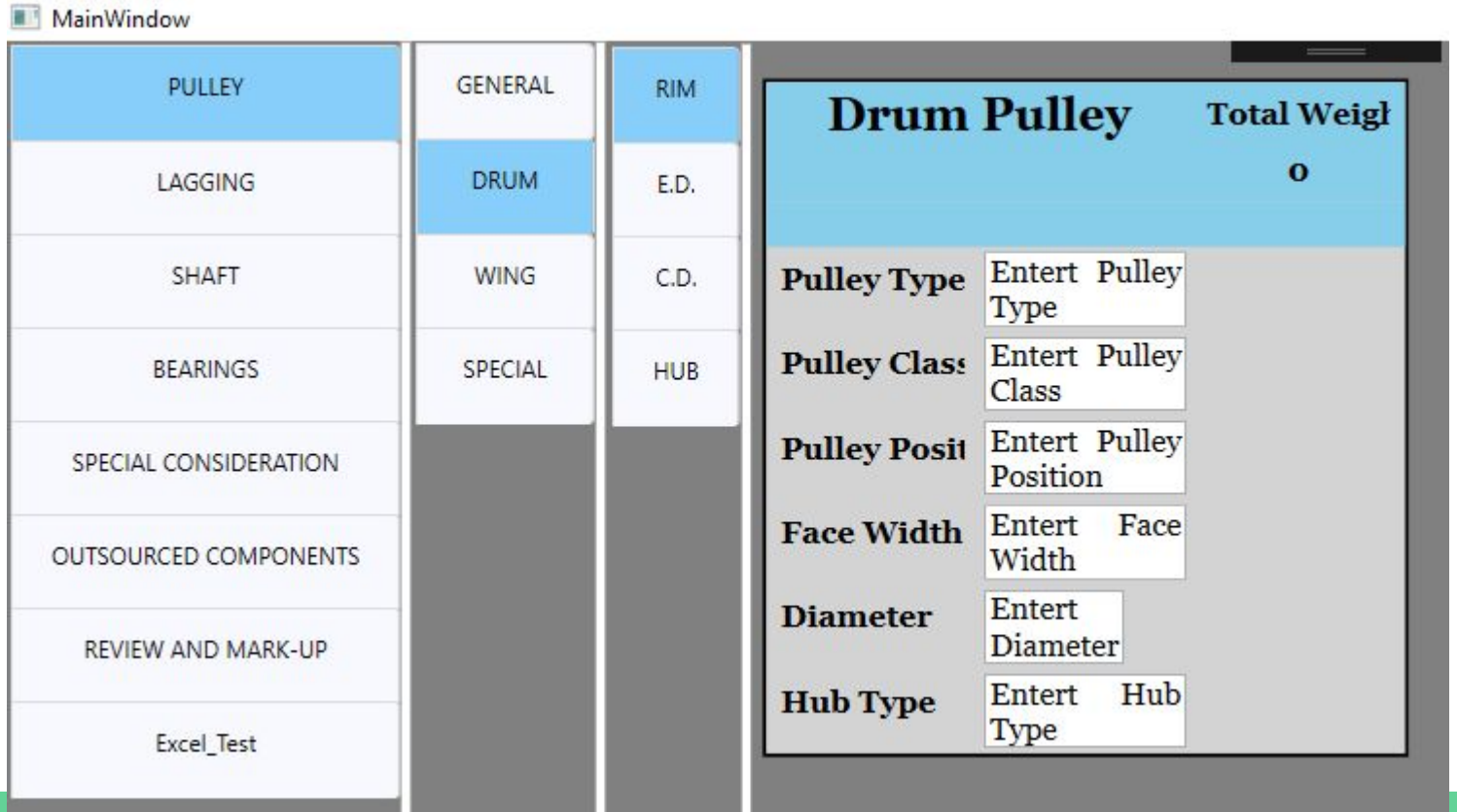
GUI design decision - second try: main window



GUI design decision - second try: menu view



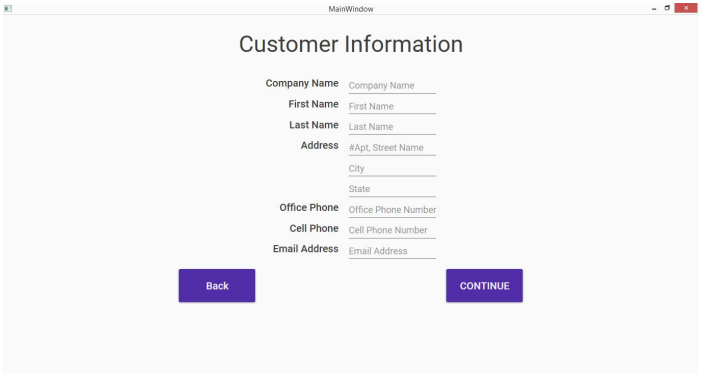
GUI design decision - second try: data entry page

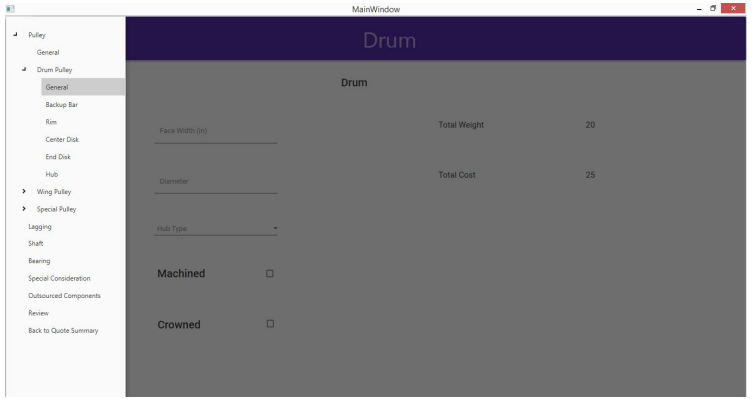


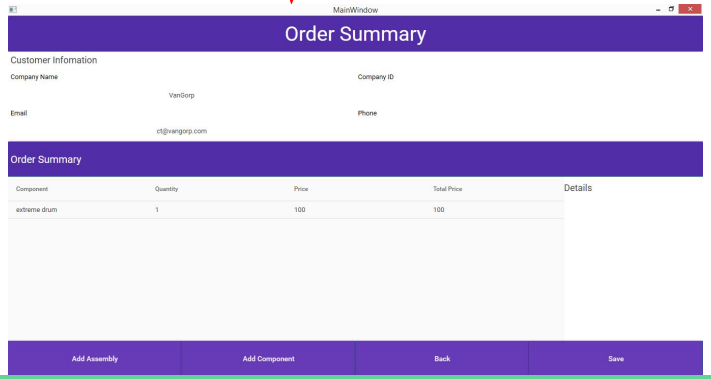
GUI design decision - second try: problems

- Summary is not clear
- No customer information
- UI theme not very professional

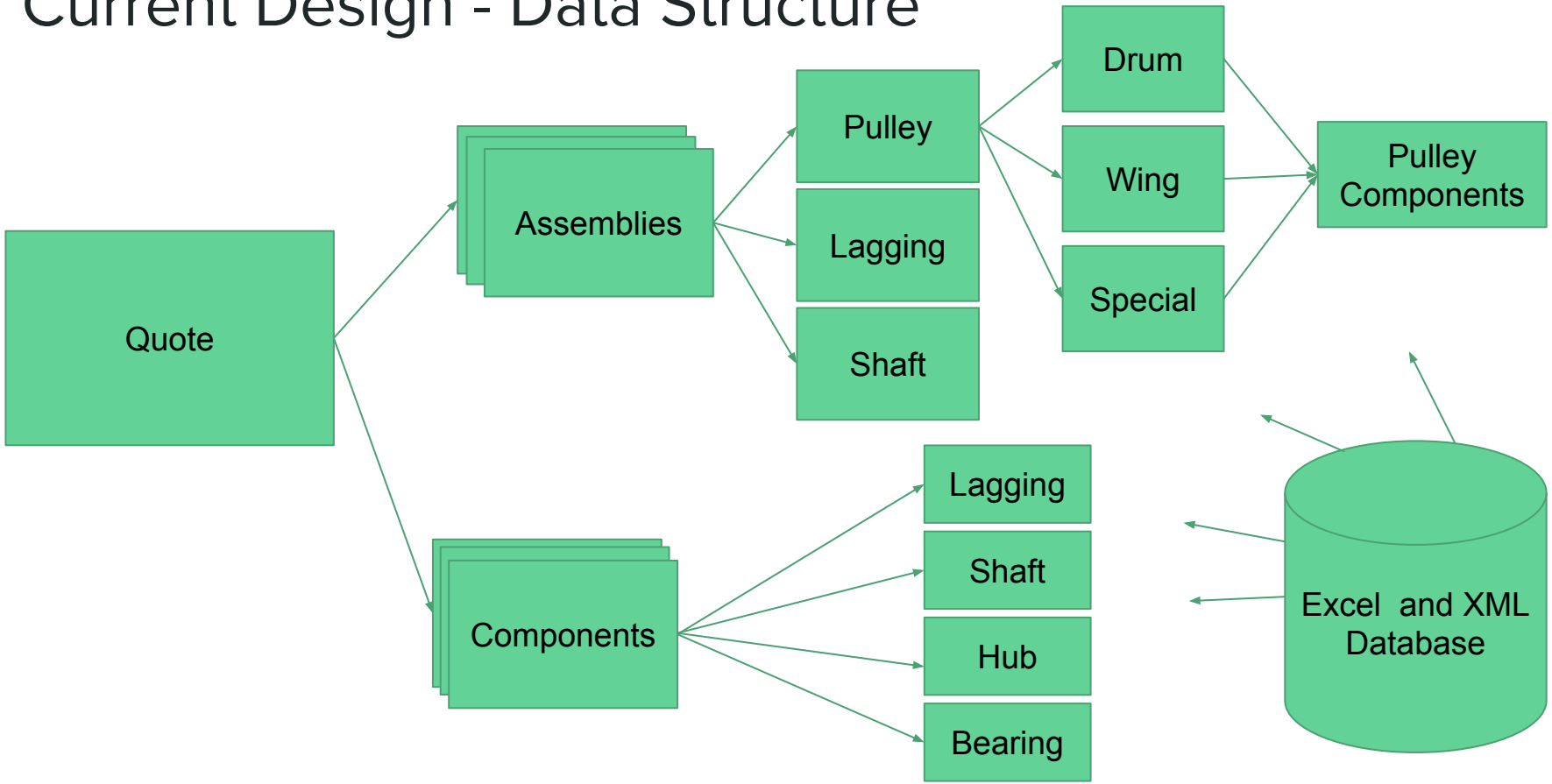
GUI design decision - final decision







Current Design - Data Structure



Live Demo

Test Plan

- Stage 1
    - Software logic testing
    - Logic combining Excel data testing
- Stage 2
    - Van Gorp (client) test QuickQuote (alpha)
    - Get feedback from our client
    - Make improvements to our software accordingly

Test Plan -- Stage 1

First stage testing plan will be done in **Visual Studio** in **C#**.

1. Conduct single component logic test.
2. Conduct assembly logic test.
3. Conduct quote creation logic test

Test Plan -- Stage 2

Second stage testing plan will be done in **cooperation** between our senior design team and Van Gorp.

Dates:

Feb.03rd: Basic component and assembly logic with relative user interface.

Feb.17th: More component logic (Tubes, Rollers) with relative equations.

Mar.XX: Finish component logic.